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The Global Talent Competitiveness Index 2020

*Global Talent in the Age
of Artificial Intelligence*



Bruno Lanvin and Felipe Monteiro, Editors



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Preface

This is the seventh edition of the *Global Talent Competitiveness Index* (GTCI) report. With its global coverage and wide range of variables, the GTCI continues to broaden its readership and to be used as a reference of choice by governments, business, and talent experts around the world. Its city component is also rapidly gathering a large audience.

This new GTCI report focuses on *Global Talent in the Age of Artificial Intelligence*, following the path initially explored by the GTCI 2017 theme of *Talent and Technology*.

Big data—largely fuelled by the internet of things (IoT)—has taken deep learning and Artificial Intelligence (AI) to levels that, until a few years ago, many considered unreachable for several decades. But in and around AI, technical advances are often mismatched with the institutions and mechanisms necessary for their full social acceptance and sustainability: Regulatory, ethical, and values-based AI strategies are among the dimensions that require specific (and coordinated) efforts.

Talent competition, and labour markets in general, have started to be impacted by the rise of AI; this trend will not diminish in the foreseeable future. The analyses, chapters, and interviews contained in this report illustrate and explore several key dimensions of the talent/AI equation. Whether from the point of view of needed training and up-skilling that would allow workers to make the best of new opportunities, or from that of establishing a firm ‘value base’ from which to develop ‘AI for good’, contributors to this year’s edition of the GTCI are highlighting the potential of AI as well as the pitfalls that can be anticipated and mitigated.

Once again, the purpose of the GTCI is to be a tool for action. It is our hope that the data, inputs, and considerations contained in the following pages can be of value to the decision-makers of private and public organisations involved in talent and job creation.

This year again, the GTCI model has been refined and improved. Some variables have been removed or replaced and a few new ones have been added. One of the main new features is the introduction of a ‘Technology adoption’ component that provides a measure of how countries use and invest in new technologies, including AI. As a result, the total number of indicators has increased from 68 to 70. Country coverage in the GTCI 2020 has also expanded and the index now includes 132 countries—up from last year’s 125 countries.

Now a regular feature of the report, the special section on cities offers a ranking of 155 cities along the various dimensions of the Global City Talent Competitiveness Index (GCTCI). This year, the model has primarily been improved in three ways: First, variables that are more business- and impact-oriented—for example, those on foreign direct investment and patent

applications—have been introduced to the model. Second, the share of values proxied by regional or national data has been reduced, so that almost all values refer to city-level data. Third, the structure of the model has been refined in that some indicators have been placed in another pillar for conceptual reasons, which has also resulted in bringing the GTCI model closer to the GTCI model.

As last year, a time-series analysis is proposed, that looks at the evolution of national economies over a six-year period of GTCI data, illustrating ways in which countries’ talent competitiveness has changed over time, both in absolute terms and in comparison with other economies.

We have also pursued our strategy of minimising the environmental impact of GTCI production and dissemination. The report is now produced exclusively in electronic format, and it remains accessible for free through dedicated websites.

This year again we want to express our deep feeling of gratitude to our faithful partner, the Adecco Group. We also welcome Google as a new partner. Our thanks go to the executives and teams involved in these organisations, and also to all the individuals, institutions, and entities that have contributed chapters, interviews, data, and ideas to the present edition.

As in previous years, we wish to direct special thanks to the European Commission Joint Research Centre (JRC), which has continued its highly professional and constructive evaluation of the strengths and weaknesses of the GTCI model. Finally, we acknowledge with gratitude the continued support of our prestigious Advisory Board.

The GTCI continues to be a work in progress, fed by the reactions, suggestions, and criticisms received from its increasing circle of readers and users. We hence look forward to hearing more from you about the report, and how we can make it even better in the future.



Bruno Lanvin

Executive Director for Global Indices, INSEAD



Felipe Monteiro

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The Adecco Group | Foreword

We are witnessing one of the most fundamental shifts in society since the first industrial revolution, which mechanised and automated traditional crafts, created new industries, and prompted the first wave of urbanisation. The technologies powering today's fourth industrial revolution are being woven through every aspect of our lives—from how we work to how we spend our free time—even if we aren't aware of them.

Companies and organisations that successfully harness the power of Artificial Intelligence (AI), machine learning, automation, and data science for the benefit of their customers, employees, and society will be the winners.

What does this mean for how we work? Automation, today combined with big data and AI, has migrated from the factory floor to the back office and, via the middle office, to the front of the house, where the company interacts with customers.

Human Resources services and operations are also being rapidly amplified by AI and digitalisation, where time-consuming tasks and inefficient processes are being replaced with automated solutions. In addition, AI and machine learning are enabling companies to crunch massive amounts of data in order to identify, organise, and present patterns and trends that aid more effective decision-making in nearly all aspects of HR.

At the Adecco Group, as the world's leading HR solutions partner, we see technology as an integral aspect of nearly all major employment and workforce transformations—whether it's automating assembly lines, in recruitment and performance evaluation, or in knowledge and relationship management. For example, Lee Hecht Harrison, an Adecco Group company, is using the chatbot 'Ella' to interact with job-hunters. 'She' is the front end of a process that aggregates and presents the most suitable job opportunities from vast amounts of vacancy data, as a first step in helping a candidate find a new job. Ella amplifies, rather than replaces, the usual face-to-face coaching and guidance.

In this 2020 edition dedicated to *Global Talent in the Age of Artificial Intelligence*, the authors of the GTCI address the growing need to better understand the 'sweet spot' where people and technology will cooperate, how rapid digitalisation will impact business and talent, and the skills needed for individuals to thrive

in the workplace of the future. Looking at previous GTCI data, we notice a widening gap between highly competitive countries and other countries in the ranking. Many countries are still struggling to leverage the skill sets of their workforce or to train them in the relevant skills for the future. Insights from the GTCI demonstrate a complex interconnection of economic performance, education systems, talent, and skills.

Technological advances are instrumental in augmenting the human role, rather than merely substituting it. There are huge benefits to be had for the organisations through optimising business and decision-making processes, and for the employees who can redirect their efforts away from these tasks and onto more strategic and human-centred leadership activities. It also means that workers, utilising AI to mine and present reliable, non-biased data, can better focus on finding innovative solutions for closing the skills gaps and building an inclusive workforce of the future. At the same time, the application of technology must not be a zero-sum game, with big winners and correspondingly big losers. A deep understanding of the profound ethical implications and potential social impact of AI, as well as of the impact of accelerating the adoption of technology, is crucial.

We at the Adecco Group see that technology and AI are already generating tremendous opportunities. This may replace many jobs, but it will create even more new ones—including jobs that don't yet exist—that require new skills and competencies. To leverage these opportunities, significant investments must be made in skilling and re-skilling. Adecco Group company General Assembly, for example, is working with individuals and client teams specifically to ensure they are updating their skills and learning for the demands of the data-rich digital world, thus smoothing many workforce transformations.

It is our intention that the GTCI help decision-makers across governments, business, and civil society to understand the challenges and opportunities that technological developments present. The index provides crucial insights to help leaders develop talent strategies that are fit for the future, overcome talent mismatches, and become more competitive in the global marketplace—all of which are essential in being able to make the most of the future of work.

Alain Dehaze

Chief Executive Officer, The Adecco Group

Google, Inc. | Foreword

We know the incredible potential of Artificial Intelligence (AI). AI applications are creating new ways for doctors to identify disease, equipping first responders to get ahead of disasters, enabling scientists to discover new materials, empowering people to communicate across different languages, and helping governments to prevent famine.

AI also holds incredible potential for our economies by boosting productivity, handling tedious tasks, and creating new jobs. Already farmers are using AI to increase the accuracy and usefulness of key agricultural factors. Banks are using AI to detect fraud with greater accuracy by rapidly identifying anomalous activities. Retailers are using AI to enable easier product discovery and better detect counterfeits.

But like groundbreaking technologies before it, AI will also affect people's jobs and change the nature of work. We need to anticipate these changes and take steps to prepare for them. Business leaders, governments, educators, trade unions, and other stakeholders each have a responsibility to manage these changes and shape a future that works for everyone.

In the 18th and 19th centuries, the steam engine and other technologies made agricultural work and distribution radically more efficient, allowing people to get the same output from the land with much less labour input. In the 19th and 20th centuries, new technologies such as the Bessemer process enabled the mass production of steel and made industrial production radically more efficient. We ultimately adapted to these changes—including by offering public secondary school education that would prepare people for more knowledge-dependent jobs.

Today, AI is changing work again. AI augments our intelligence. It will make many more routine tasks much easier, thereby reducing demand for those tasks and putting some jobs at risk. At the same time, it will create the need for new tasks and create opportunities that didn't exist before, including enabling workers to spend more time on creative work. And it will transform some existing tasks, resulting in the ability to serve more people at scale.

While research by McKinsey and others has shown that few jobs—likely less than 5%—are at risk of outright displacement, these same studies suggest that as many as two-thirds of jobs will undergo substantial changes. Adapting to these changes will require helping people to gain critical skills. For some, it will mean skills in AI. For others, it will mean a broader set of digital skills.

At Google, we are working on both. We have developed Learn with Google AI (<https://ai.google/education/>), which is focused on AI education and includes our Machine Learning Crash Course. This course has already been used to train more than 20,000 engineers at Google—our own small future of work microcosm—and is available in 11 languages.

With respect to the broader set of digital skills that are needed for changes in work, Google has made a major commitment to training through our Grow with Google programme. For instance, since 2014, we have helped over 11 million people in Europe, the Middle East, and Africa access the skills needed for the jobs of the future. And in the United States, we launched an IT support certificate program that provides a pathway to jobs at top employers—including Google—to address skills gaps.

As we pursue programmes like these, and other business leaders pursue their own efforts, we need to better understand how AI will affect work so that we can target our efforts most effectively. What tasks are more likely to be simplified by AI and require a smaller workforce? What tasks can be performed entirely by a machine? What new human tasks will be created as a result of AI? And which countries and regions are best anticipating these changes?

INSEAD's research, and specifically the Global Talent Competitiveness Index, should help provide answers to some of these critical questions. With better data, and by sharing lessons learned across sectors and geographies, we all will be in a better position to leverage the opportunities from the next technology revolution.

Kent Walker

Senior Vice President of Global Affairs, Google Inc.

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Chapters

CHAPTER 1

Global Talent in the Age of Artificial Intelligence

Bruno Lanvin, Felipe Monteiro, and Michael Bratt

INSEAD

This seventh edition of the *Global Talent Competitiveness Index* (GTCI) report builds on the GTCI's earlier findings on 'Talent and Technology',¹ taking them one step further by focusing on *Global Talent in the Age of Artificial Intelligence*. Through a combination of analytical chapters and interviews, the report attempts to bring context to the data and rankings of this year's results.

A BIT OF HISTORY

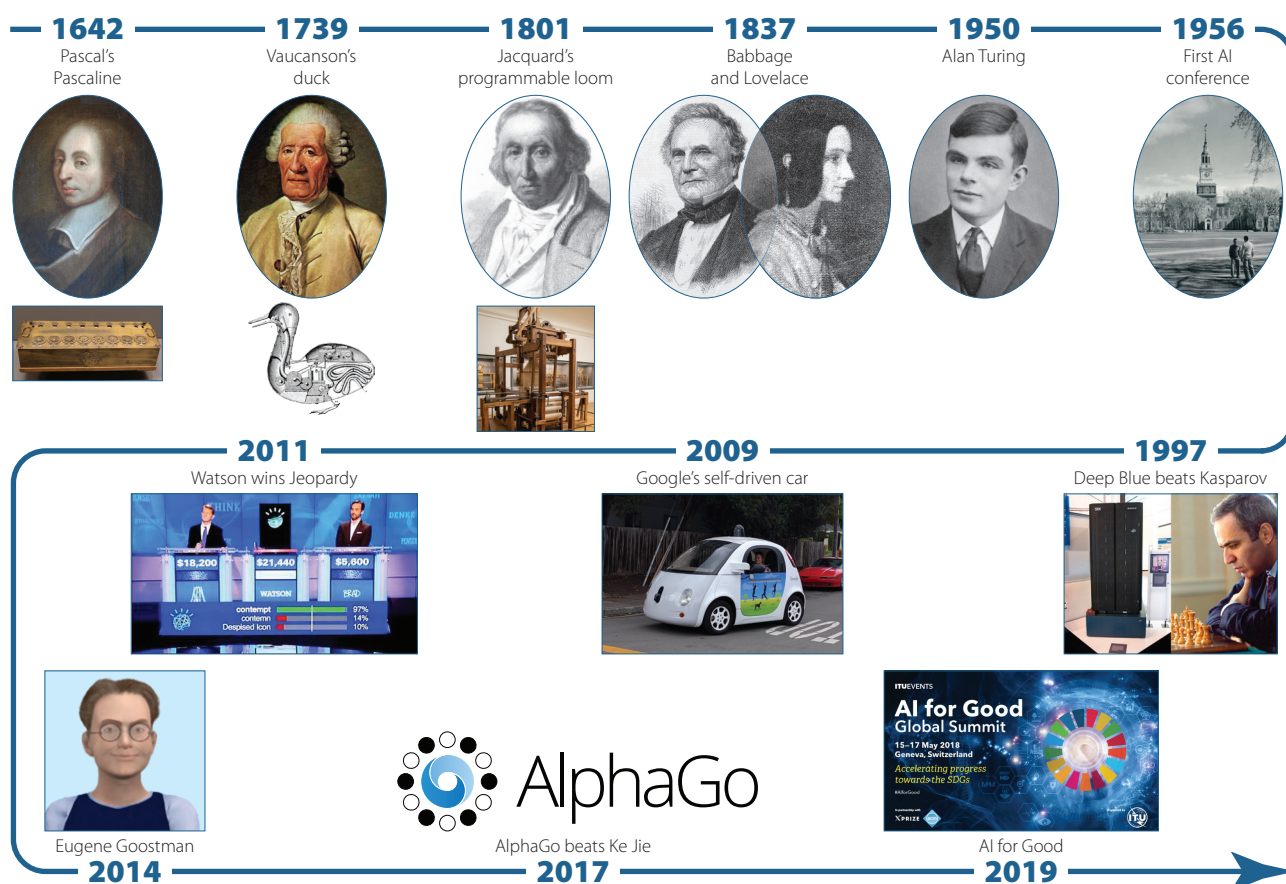
Artificial Intelligence (AI) is not an entirely new concept. Starting with Blaise Pascal's calculating machine (the 'Pascaline', 1642), Jacques de Vaucanson's 'Digesting Duck' (1739) and mechanical loom (1740), and Joseph Jacquard's punched cards programme (1802) and followed by the pioneering computer work of Charles Babbage, Ada Lovelace (1837), and Alan Turing (1950), AI has been a dream of mankind since the Enlightenment period. The term *AI*, however, was officially first used at a conference convened by Dartmouth College in Hanover, New Hampshire, in 1956.²

From then on, considerable attention, investment, and hopes coalesced around the promises of AI, seen largely as a way

to address complex problems in mathematics and physics. Two main approaches were pursued. On one hand, GOFAI (for 'Good Old-Fashioned Artificial Intelligence') was based on the desire to identify abstract ways to allow machines to reason and analyse data, uninfluenced by the way in which human brains were functioning. On the other hand, efforts were being pursued to develop an 'artificial neural network', mimicking the human brain and trying to build a structure (an artificial brain) with a capacity to learn.

Until the 1970s, the GOFAI approach dominated, attracting both excitement and government funding. Disappointing results and the lack of operational applications (combined with the inability of neural networks to generate significant success) led to an 'ice age' of AI that lasted much of the following two decades. Then the sudden availability of big data—the result of the emergence of the internet, the internet of things (IoT), and the spectacular decrease in the price/performance ratio of processors and data storage—changed everything. Neural networks became the promising avenue, and 'deep learning'

Figure 1
The AI Timeline



Source: GTCI team.

Photos of Pascaline and Jacquard's loom courtesy of Bruno Lanvin. Photo of Dartmouth College Baker Library courtesy of Dartmouth College Library. Photo of Deep Blue by James the photographer – <https://www.flickr.com/photos/22453761@N00/592436598/>, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=3511068>. Photo of Garry Kasparov Copyright 2007, S.M.S.I., Inc. – Owen Williams, The Kasparov Agency. – http://www.kasparovagent.com/photo_gallery.php, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=4507359>. Photo of Google's self-driven car by Grendelkhan – Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=47467048>.

the engine that brought to AI the status of a game changer for human civilization.³ Over the last 25 years, AI attained spectacular heights, beating the chess world champion (IBM's Deep Blue vs Gary Kasparov in 1997), then the world champion of Go (Google's AlphaGo vs Lee Sedol in 2016, and Ke Jie in 2017); getting cars closer to full self-driving abilities; and pervading our daily lives through a huge range of devices and software products (Figure 1).

NEW HOPES AND NEW FEARS

Such spectacular results gave rise to hopes that AI could be the unexpected solution to longstanding problems such as climate change, energy scarcity, and endemic diseases. Yet, with this new age of AI came a broader perception that some of its consequences needed to be better understood, and possibly regulated, to ensure that AI would be a force for good.

Fears can be of different kinds. Some stem from a fear of change, or a fear of losing a job or a prestigious social status. Others result from the accelerated pace at which AI and related

technologies develop, often in the absence of a proper and effective regulatory legal framework.

In both cases, additional attention is clearly needed to address or mitigate such fears. Short of such an effort by all stakeholders (governments, business, citizens), counter-productive and divisive forces may gather in the guise of modern luddite-like movements or, more broadly, in the shape of diminished social acceptance for progress and technology.

Two main avenues call for immediate attention: How will AI change the future of work? How can we ensure that AI remains a force for good and helps us improve the world's future prospects?

As we see below, both avenues are tightly intertwined.

AI AND TALENT: SUPPLY AND DEMAND

From a talent perspective, two main areas—which can be called the *demand side* and the *supply side* of skills—deserve particular attention. On the demand side, the key questions are: What skills need to be developed to allow humans to take full advantage

of the advances in AI, and how can those skills be provided, acquired, and updated? The main issue on the supply side is: What can one reasonably expect from new and future AI capabilities in terms of recruitment, human resources management, and the enhancing of current and future human skills?

Supplying AI for Better Labour Markets

A number of AI-based products are already available to help both job seekers to identify possible employment opportunities, and employers to find the best-qualified people for specific functions within their organisations. It has been argued that AI often proves better than humans at identifying the best candidates for a particular job, as it is more immune to unconscious biases,⁴ a common trait of practically all humans.⁵

Many start-ups (including Cogito, Percolata, and pymetrics) are flooding the market with AI-based interview and recruitment tools. New York-based pymetrics, in particular, has met significant success with an AI programme that uses a series of games to test for relevant skills. The company stresses that algorithms are then analysed to make sure they are not creating biased hiring outcomes or favouring any particular group. In April 2019, another Swedish start-up (TNG) began to use a physical robot called *Tengai* to carry out job interviews, claiming it provided a more 'bias free' process than traditional interviews.⁶

AI systems go even further by offering continuous evaluations of workers' performance, and even tools to predict their future performance: IBM, for example, which has been using Watson, its AI platform, during employee reviews to predict future performance, claims a 96% accuracy rate.⁷

A Growing Demand for AI-Compatible Skills

The impact of automation on jobs has been the subject of the GTCI 2017, as well as of significant recent research, pointing towards different estimates of how many 'old jobs' would disappear and how many 'new jobs' would be created.⁸ Ample reference has been made to the rapidly expanding abilities of machines and equipment (robots, exoskeletons, among others) to replace or augment humans in dangerous or repetitive tasks (e.g., detecting and defusing explosives, performing physical tasks such as lifting, displacing or handling heavy or potentially harmful loads, etc.).

Yet, until recently, the dominant thinking (and analysts' focus) has tended to consider that old jobs (especially dangerous or repetitive ones) would be replaced with new jobs (typically those with a higher intellectual or creative component). In other words, automation was expected to destroy blue collar jobs and create new (white collar) ones. With the advent of ubiquitous AI, that equation will be significantly altered. By allowing machines and algorithms to rival humans in an increasing number of high-end jobs, AI is giving a new dimension to automation: The jobs of accountants, news reporters, doctors, radiologists, lawyers, bankers, and data analysts all now rely on an increasingly important AI component. This new characteristic of automation can be seen by many as the symptom of a rapid human/AI substitution process.

Even the simple principle that 'humans manage machines, and not the other way around' is being challenged by new

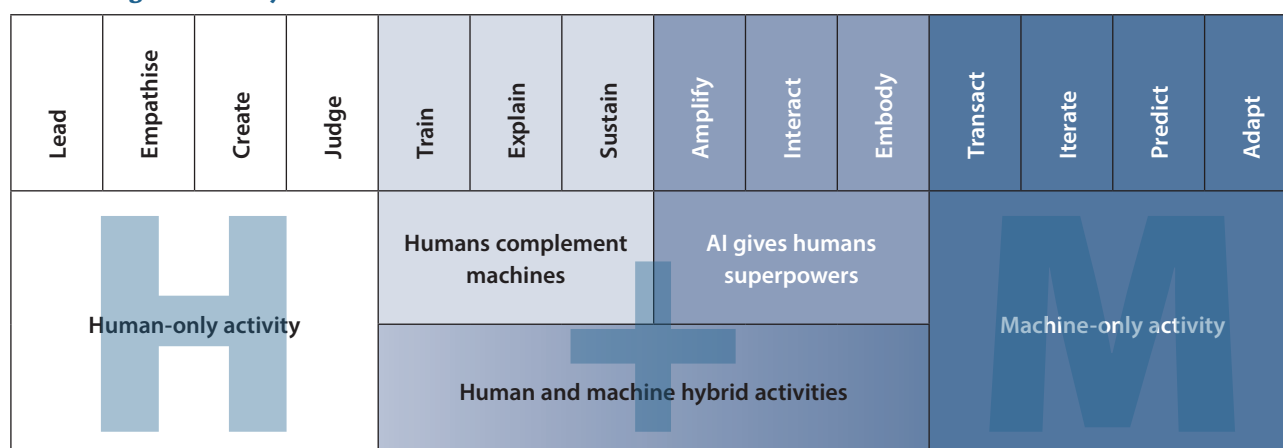
advances in AI. In a recent article, the *New York Times* underlined that *'For decades, people have fearfully imagined armies of hyper-efficient robots invading offices and factories, gobbling up jobs once done by humans. But in all of the worry about the potential of Artificial Intelligence to replace rank-and-file workers, we may have overlooked the possibility it will replace the bosses, too. ... The goal of automation has always been efficiency. What if artificial intelligence sees humanity itself as the thing to be optimized?'*⁹

When it comes to identifying the skills that will be needed most in the age of AI, however, much of current reasoning has been focusing on the two ends of the spectrum—that is, lower-skills jobs (which can be most easily delegated to machines) on one hand, and jobs requiring sophisticated skills that only humans can hold on the other. In this report, Chapter 5 by Dimitris Bertsimas and Theodoros Evgeniou brings an additional dimension to this issue, considering AI in the context of 'augmented work'. In their seminal book *Human + Machine*,¹⁰ Paul Daugherty and James Wilson emphasise the notion of a 'missing middle'—the broad area of skills required for 'hybrid tasks' to be exercised jointly by humans and machines (see Figure 2).

The two authors consider that, in the workplace and in labour markets, the future of AI will rely on fruitful mutual contributions between humans on one hand and machines on the other through *hybrid activities*. To best fulfil and manage such activities, new skills—which they call *fusion skills* (see Figure 3)—will be required. Such skills include:

- rehumanizing time (fusion skill #1), which contributes to generating a better work-life balance for humans;
- responsible normalising (fusion skill #2), which is largely about safeguarding the social acceptability of AI by introducing it skilfully and progressively—in this context, Daugherty and Wilson insist on the role of Chief Executive Officers (CEOs), who *'must develop a clear thesis on the future of work'*;¹¹
- judgement integration (fusion skill #3), whereby human judgement remains the one to be exercised whenever AI gets confused or hesitant;
- intelligent interrogation (fusion skill #4), a key tool for those working alongside AI to know how to guide it along the path where it can be most helpful;
- bot-based empowerment (fusion skill #5), which allows those who master it to obtain 'superpowers' from their AI agents;
- holistic melding (fusion skill #6), which allows humans to work with AI in a congenial way, as if AI were a natural extension of their own body or persona;
- reciprocal apprenticing (fusion skill #7), by which AI's ability for deep learning is enhanced by the humans

Figure 2

The missing middle of hybrid activities between humans and AI

Source: Based on Daugherty & Wilson (2018), p. 8.

managing it, and, reciprocally, humans continue to acquire new abilities to leverage the power of AI; and, finally,

- relentless reimagining (fusion skill #8), which makes it possible to make a clear distinction between AI-enriched activities on one hand and mere automation on the other, by constantly creating new processes and business models from scratch.

Considering the profound impact of ubiquitous AI on skills, jobs, and the future of work, it is clear that not all of the necessary transitions will be frictionless. Social resistance may be high in some sectors. Even in those parts of society where the potential benefits of AI will be clearly perceived, its acceptability and sustainability will require more than a convincing economic

equation: Values-based AI strategies and principles-led AI policies will be required.

AI AND VALUES: IN SEARCH OF CHECKS AND BALANCES

In all parts of the world, AI strategies have emphasised the need for early adoption of the rules and principles that should guide AI research, development, and deployment. For example, in Europe, the United Kingdom's Centre for Data Ethics and Innovation (CDEI) has underlined the importance of the need for data protection and the necessity of mitigating or preventing algorithmic bias.¹² Similar principles are central to the French and European approaches to AI,¹³ which put special emphasis on data privacy and protection and the importance of developing algorithms that are explainable and intelligible to ordinary people.

It is also worth keeping in mind the potential role of AI as an engine for innovation and problem solving in the face of global issues that are often seen as intractable. How can AI help us protect the environment and identify optimal strategies to fight poverty, endemic diseases, inequalities, corruption, and terrorism? How can it do all this while respecting our legitimate aspiration for freedom of expression, and the cultural, religious, and other sensitivities around the globe?

Such aspects are well covered by two other chapters in this report: Chapter 3 (by authors from the Organisation for Economic Co-operation and Development, OECD) spells out the OECD AI Principles, adopted in May 2019; and Chapter 4 (by the Secretary-General of the International Telecommunication Union or ITU, Houlin Zhao) describes the principles and objectives that have guided the United Nations approach to 'AI for Good'.

AI AND GLOBAL TALENT COMPETITIVENESS: A GEO-POLITICAL VIEW

An increasing number of economies have adopted some kind of national (or international) AI strategy. Bill Dutton had identified 24 of them by the end of 2018; the Future of Life Institute

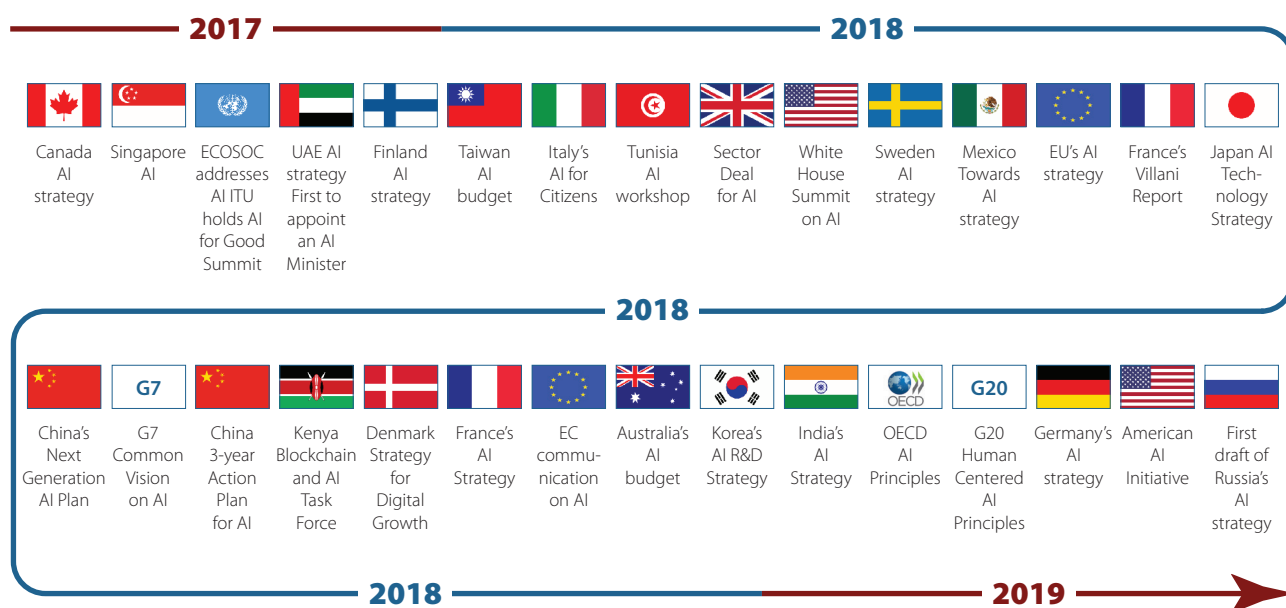
Figure 3

The future of AI-human cooperation in the workplace: Fusion skills

Human and machine hybrid activity					
Humans complement machines			AI gives humans superpowers		
Train	Explain	Sustain	Amplify	Interact	Embody
Rehumanising time			Intelligent interrogation		
Responsible normalising			Bot-based empowerment		
Judgement integration			Holistic melding		
Reciprocal apprenticeship					
Relentless reimagining					

Source: Based on Daugherty & Wilson (2018), p. 186.

Figure 4

The growing number of AI strategies around the world (2017–2019)

Sources: GTCI team, based on data from Dutton (2018) and the Future of Life Institute (2019).

mentions 30 (adding a G7 agreement, as well as texts approved by the Baltic states, by the United Arab Emirates and India, and by France and Canada, for example).¹⁴ See Figure 4.

Among such strategies, Urs Gasser, executive director of the Berkman Klein Center for Internet & Society at Harvard University, sees three archetypes, incarnated respectively by the United States, Europe, and China: 'U.S.'s *laissez-faire approach prioritizes innovation, and lawmakers intervene only when things go wrong. In the European Union, the precautionary principle—which puts citizen protection, ethics and responsible management before tech innovation—underpins the General Data Protection Regulation, which was launched in May 2018. Meanwhile, China is mostly concerned about the ways in which A.I. might affect existing social, political and economic relationships*'.¹⁵ Singapore has developed a citizen-centric approach (embedded in its Model Artificial Intelligence Governance Framework), which may constitute an additional reference in the future: "What is lacking is how to operationalize these principles and get buy-in from regulators, industry and consumers," says V.K. Rajah, Singapore's former attorney general and the chair of the Republic's Advisory Council on the Ethical Use of Artificial Intelligence and Data, a government initiative that brings together transnational industry leaders from diverse backgrounds, including large tech companies, users, and academic and government stakeholders.¹⁶ It is particularly remarkable that Singapore has identified talent as one of the fundamental pillars of its approach to AI.¹⁷

It must also be kept in mind that efforts to produce national AI strategies are being pursued in all parts of the world. Later in this report, Chapter 2 by Fabio Caversan and Marco Stefanini provides an overview of efforts to produce such strategies in Latin America. Yet, from a geo-strategic point of view, the race for AI

leadership is currently led by two players—the United States and China; Europe is trying hard to get its act together and be more than a distant third in the future. In such a context, the race for AI talent and the quest to develop the fusion skills described by Daugherty and Wilson is bound to intensify. In a world where talent will become increasingly fluid and mobile, the ubiquity of AI could amplify current imbalances. Will the United States and China continue to dominate the AI sphere? If so, what kind of national talent strategies are they likely to develop to grow, attract, and retain AI-capable and AI-compatible talent? Will the gap between winners and losers in this new AI world create an unsurpassable gap for other countries, and especially emerging economies?

Later in this report, the interview granted by Nicolas Schmit, the new European Commissioner for Jobs and Social Rights, will cast additional light on the ways in which Europe (and the EU's Member States) may be able to address its current AI challenges (see Box 1).

Whatever part of the world is considered, it is fair to say that reliable data are relatively abundant for investments and funding (including in the start-up sphere), but remarkably scarce when it comes to the relationship between AI and talent. One of the most commonly cited references to identify the origin and location of AI talent is the work of Element AI, which identified the nationalities of researchers participating in international AI conferences.¹⁸ A more systematic and analytical way to track AI-related talents is hence urgently required.

Beyond the quantification of AI talent (and possible related gaps), one additional question needs to be raised regarding global talent competitiveness: Should such competitiveness be considered at the level of national economies? As analysts and

BOX 1: AI: A SPECIAL CHALLENGE FOR EUROPE

In 2018, Europe began a coordinated effort to address the challenge presented by AI. The following excerpts are from the declaration that began this process and the proposals of the resulting plan. More information about each is available in the following websites.

'On 10 April 2018 25 European countries [24 EU member countries and Norway] signed a Declaration of cooperation on Artificial Intelligence (AI). Whereas a number of Member States had already announced national initiatives on Artificial Intelligence, they now declared a strong will to join forces and engage in a European approach to deal therewith.' <https://ec.europa.eu/digital-single-market/en/news/eu-member-states-sign-cooperate-artificial-intelligence>

As of 25 April 2018, the European Commission started working with Member States to have a coordinated plan on AI by the end of the year. The main aim was *'to maximise the impact of investment at the EU and national levels, encourage cooperation across the EU, exchange best practices, and define the way forward together, so as to ensure the EU's global competitiveness in this sector.'* In the meantime, the Commission continued *'to invest in initiatives which are key for AI, including the development of more efficient electronic components and systems (such as chips specifically built to run AI operations), world-class high-performance computers, as well as flagship projects on quantum technologies and on the mapping of the human brain.'* <https://ec.europa.eu/malta/>

[news/artificial-intelligence-commission-outlines-european-approach-boost-investment-and-set-ethical_en](https://ec.europa.eu/artificial-intelligence-commission-outlines-european-approach-boost-investment-and-set-ethical_en)

'A coordinated plan prepared with Member States to foster the development and use of AI in Europe ... proposes joint actions for closer and more efficient cooperation between Member States, Norway, Switzerland and the Commission in four key areas: increasing investment, making more data available, fostering talent and ensuring trust. Stronger coordination is essential for Europe to become the world-leading region for developing and deploying cutting-edge, ethical and secure AI.'

One of the four prioritised areas of public interest for this plan is to *'nurture talent, skills and life-long learning'*. The Member States agreed that *'talent in Europe is essential for the development and use of AI, but EU countries face shortages of ICT professionals and lack AI-specialised higher education programmes. That is why the Commission, together with European countries, will support advanced degrees in AI through, for example, dedicated scholarships. The Commission will also continue to support digital skills and lifelong learning for the whole of society, and especially for workers most affected by AI, as detailed in its AI strategy. For the development of human-centred AI, it is also important that AI is present in education programmes in other disciplines, such as law. Full use of the Blue Card system will also help to retain and attract highly-skilled AI professionals in Europe.'* https://ec.europa.eu/cyprus/news/20181207_en

observers of the AI global scene have often stressed, the real powerhouses of AI may not be nations but large business entities. In his seminal book *AI Superpowers: China, Silicon Valley, and the New World Order*,¹⁹ Kai-Fu Lee writes *'Of the hundreds of companies pouring resources into AI research ... seven have emerged as the new giants of corporate AI research: Google, Facebook, Amazon, Microsoft, Baidu, Alibaba and Tencent. These seven giants have, in effect, morphed into what nations were fifty years ago—that is, large and relatively closed-off systems that concentrate talent and resources on breakthroughs that will mostly remain "in house"'*.²⁰

In addition to the AI/talent strategies pursued by nation-states on one hand and large corporations on the other, one must also grant due attention to the efforts pursued at sub-national levels, especially by cities. This is the purpose of the section of this report devoted to cities and regions, illustrated by a contribution from Bizkaia Talent (Bilbao) and an interview by Anja Hendel, Director, Porsche Digital Lab in Berlin.

KEY MESSAGES EMERGING FROM THE GTCI 2020

- **Message 1: The gap between talent champions (almost all of them high-income countries) and the rest of the world is widening.** A similar gap is also seen in the universe of AI. AI talent is scarce and unequally distributed

across industries, sectors, and nations. More than half of the population in the developing world lack basic digital skills. In the age of AI, this digital skills divide is broadening, with a few countries progressing quickly while most of the developing world is lagging. AI policies and programmes should work to minimise negative outcomes and increase access to AI for those left behind.

- **Message 2: AI may also provide significant opportunities for emerging markets to leapfrog.** The GTCI's longitudinal analyses highlight that—even if it is the exception rather than the rule—some developing countries (e.g., China, Costa Rica, and Malaysia) can become talent champions in their respective regions, while others (e.g., Ghana and India) have significantly improved their capacity to enable, attract, grow, and retain talent over the past few years, and hence can be labelled *talent movers*. As India did in the late 1990s (becoming a global offshoring base for IT services), AI may provide opportunities for other countries/regions (e.g., Latin America) to become 'global delivery centres' for AI applications.
- **Message 3: Turning AI into a force for good requires a proactive, cooperative approach.** AI can play a key role in providing solutions to help humanity achieve the

United Nations Sustainable Development Goals (SDGs): Education (with customised online programmes) and health (with personalised remote diagnosis and follow-up, as well as big data analysis to track and reduce endemic diseases and epidemics) are two of the most immediate examples. This, however, will require multi-stakeholder cooperation. The two sides (supply and demand) of the AI/talent equation deserve concurrent attention: (1) Build the skills necessary to ensure optimal human/machine cooperation and (2) create the conditions to maximise the social value and long-term sustainability of such cooperation. It is also fundamentally important that AI be designed within universally accepted guiding principles respecting the rule of law, fundamental human rights, inclusion, and diversity.

- **Message 4: The emergence of AI in the workplace requires a massive re-skilling of the workforce.** At all levels of qualifications, workers will need training on adaptability, social intelligence, communication, and problem-solving. Life-long learning will increasingly play a key role in developing skills to foster empathy, creativity, imagination, judgement, and leadership, which are likely to continue to be human-only activities. Re-skilling will also be necessary to develop fusion skills in order to allow humans and machines to effectively and efficiently interact in hybrid activities.
- **Message 5: When introducing AI to organisations, communities, or societies as a whole, acceptability is a condition for sustainability.** It seems critical to create a narrative about AI and the future of jobs that emphasises its many possibilities instead of just instilling more fear. It is essential, however, that the broader workforce (including the youth, women, and older people) should have the opportunities, skills, and interest (and feel empowered) to fulfill the millions of new jobs that will be created by AI, directly or indirectly. It should be emphasised that AI will augment human capabilities directly and that human-AI teams could be more productive than either AI or workers alone. AI-based automation also offers opportunities to re-humanise time (e.g., through a better work-life balance for humans) and to offer more intellectually stimulating jobs. Policymakers and regulators will have key roles to play—including through the provision of social safety nets—to ensure smooth job transitions. Since AI-induced changes will be fast and broad-ranging, it will be important for educators and leaders to realise that new generations will continue to attach key importance to values and seek jobs that offer them opportunities to contribute in a meaningful way to society.
- **Message 6: Cities are striving to become AI hubs and attract relevant talents.** Such efforts translate to different initiatives and strategies (curricula in local universities and schools and aggressive policies to detect, attract, and

retain AI talents, for example). In many respects, such efforts coincide with cities' strategies to become smart cities, as AI becomes a core engine of the local transformation of transportation networks, energy grids, and other fundamental components of urban strategies. Currently—and increasingly in the future—cities continue to be the main testbeds for new AI-based tools such as facial recognition, tele-surveillance, and self-driven vehicles. Experience shows that perceptions of the value of such technologies vary greatly from one city to another, which is a phenomenon worth watching before these tools can be sustainably deployed.

THE GTCI CONCEPTUAL FRAMEWORK

As underlined in the previous six editions of the GTCI, countries are competing globally to grow better talent; attract the talent they need; and retain those workers who contribute to competitiveness, innovation, and growth. Countries seek to put economic and social policies in place that will facilitate this. In such a context, governments, businesses, and various other stakeholders need quantitative instruments that can inform their decisions (as investors, employers, employees, or jobseekers) and can help them design and implement better policies in areas such as education, employment, and immigration, to name a few. This is the purpose of the GTCI.

Who Is Expected to Use the GTCI and Why?

Decisions regarding the development, attraction, and empowerment of talent are remarkably complex and multi-layered. They involve a multi-disciplinary endeavour to tackle talent dilemmas that have been raised in the fields of economics, education, human resource management and organisational behaviour, entrepreneurship, innovation, and strategy. At the policy level, this complexity is compounded by emotional dimensions and the international consequences of choices to be made in terms of immigration, social equity, and fiscal incentives, among other issues.

Faced with such intricate issues, decision-makers—both public and private—need quantitative tools that will enable them to benchmark the efforts made and results obtained in different socioeconomic environments in terms of talent management and talent competitiveness. The GTCI has been designed to help address this challenge by providing a composite view of talent competitiveness applicable to a large number of countries (132 this year). Although a number of composite indices concerning skills, talent, and human capital have been developed in recent years, both private and public players in the field see the need for a neutral, global, and respected index that would enable them to assess the effectiveness of talent-related policies and practices, identify priorities for action in relevant areas, and inform international and local debate in this arena.

The Structure of the GTCI Model

In the context of the GTCI, *talent competitiveness* refers to the set of policies and practices that enable a country to develop, attract, and empower the human capital that contributes to productivity

and prosperity. The GTCI is an Input-Output model (see Figure 5) in the sense that it combines an assessment of what countries do to produce and acquire talents (Input) and the kind of skills that are available to them as a result (Output). Feedback received on previous editions, additional research, and the availability of new data have allowed refinements to the model, though its basic structure is robust and unchanged.

The Input pillars of the GTCI are inspired by the Attract-Grow-Retain framework used by corporations to steer talent management. Multinational corporations frame talent management in these terms, defining talent management as an organisation's efforts to attract, select, develop, and retain talented employees to meet their strategic needs.²¹ The GTCI focuses on efforts by countries and thus the model is fed by macroeconomic and country-level variables. **Attracting** talent, in the context of national competitiveness, should be viewed in terms of luring foreign valuable resources, both productive businesses (through foreign direct investment and the like) and creative people (through high-skilled migration), while internal attraction is focused on removing barriers to entering the talent pool for groups such as those from underprivileged backgrounds, women, and non-native people. **Growing** talent has traditionally meant education, but its definition should be broadened to include apprenticeships, training, and continuous education as well as experience and access to growth opportunities (although we may acknowledge that most skill development occurs through experience, much remains to be done to conceptualise and measure its role). The more talented the person, the wider the global opportunities he or she can find elsewhere. **Retaining** talent is thus necessary to ensure sustainability, and one of the main components of retention is quality of life. In addition, the regulatory, market, business, and labour landscapes within a country facilitate or impede talent attraction and growth; the GTCI classifies these elements as parts of the **Enable** pillar. Together, Enable, Attract, Grow, and Retain constitute the four Input pillars of the GTCI model.

Regarding Output, the GTCI differentiates between two levels of talent, which can be broadly thought of as mid-level and high-level skills. Mid-level skills, labelled **Vocational and Technical Skills** (or VT Skills), describes skills that have a technical or professional base acquired through vocational or professional training and experience. The impact of VT Skills is measured by the degree of employability to which they lead. Employability is measured by indicators of skills gaps and labour market mismatches and by the adequacy of education systems. High-level skills, labelled **Global Knowledge Skills** (or GK Skills), deal with knowledge workers in professional, managerial, or leadership roles that require creativity and problem solving. Their economic impact is evaluated by indicators of innovation, entrepreneurship, and the development of high-value industries. Together, VT Skills and GK Skills constitute the two Output pillars of the GTCI model.

The GTCI attempts to offer an approach to talent competitiveness issues that is comprehensive, action-oriented, analytical, and practical. As described earlier, the GTCI is a composite index, relying on a simple but robust Input-Output model, composed

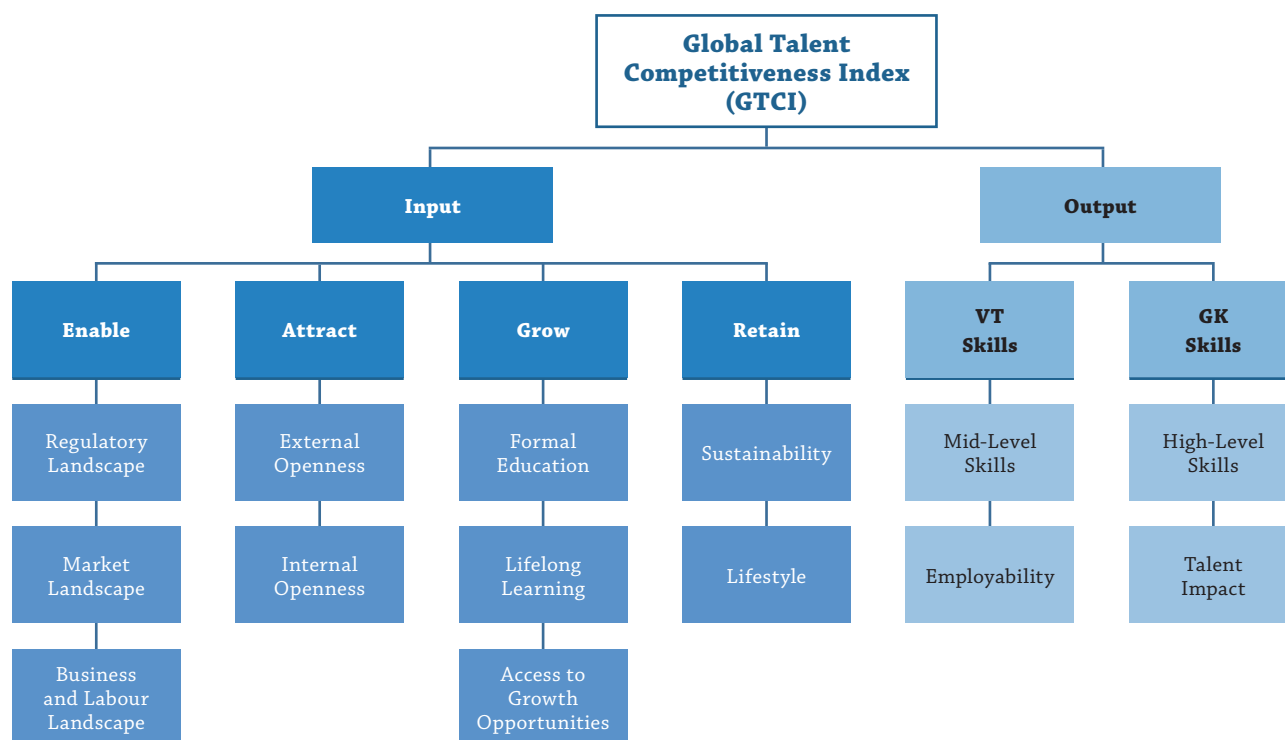
of six pillars (four on the Input side and two on the Output side), as illustrated in Figure 5. As such, the GTCI generates three main indices that are the most visible focus for analysis, namely:

1. **The Talent Competitiveness Input sub-index**, which is composed of four pillars describing the policies, resources, and efforts that a particular country can harness to foster its talent competitiveness. Enable (Pillar 1) reflects the extent to which the regulatory and business environment—including issues about competition, management practices, and the functioning of labour markets—create a favourable climate for talent to develop and thrive. The other three pillars describe the three levers of talent competitiveness, which focus respectively on what countries are doing to Attract (Pillar 2), Grow (Pillar 3), and Retain (Pillar 4) talent. The Input sub-index is the simple arithmetic average of the scores registered on these four pillars.
2. **The Talent Competitiveness Output sub-index**, which aims to describe and measure the quality of talent in a country that results from the above policies, resources, and efforts. It is composed of two pillars describing the current situation of a particular country in terms of Vocational and Technical Skills (Pillar 5) and Global Knowledge Skills (Pillar 6). The Output sub-index is the simple arithmetic average of the scores obtained on these two pillars.
3. **The Global Talent Competitiveness Index (GTCI)**, which is computed as the simple arithmetic average of the scores registered on each of the six pillars described above.

The GTCI model has been refined in this 2020 edition with respect to last year. In particular, four notable changes have been made. First, the variables Ease of hiring, Ease of redundancy, and Gender earnings gap included in GTCI 2019 have been dropped because of their weak explanatory power of the variation in GTCI scores—a point that has been made in previous Joint Research Centre (JRC) audits. Second, last year's indicator Business-government relations has been dropped because it has not been updated since 2014 and is not slated for an update in the foreseeable future.

Third, a new conceptual component—Technology Adoption—has been created in the Business and Labour Landscape sub-pillar. This component consists of three variables: Technology utilisation (this is an old indicator that has been moved from the Market Landscape sub-pillar), Investment in emerging technologies (a new indicator), and Robot density (a new indicator). The Technology Adoption component aims to capture the extent to which countries are taking steps to be at the forefront of new technologies and, by implication, to develop talents associated with AI, IoT, and so on. Fourth, four new variables have been introduced (in addition to the new Technology Adoption indicators): Rule of law adds another dimension to the strength of institutions in the Regulatory Landscape sub-pillar, Urbanisation reflects the positive impact that cities can have on growth and human capital formation (Market Landscape sub-pillar),

Figure 5
The GTCI 2020 model



Note: GK Skills = Global Knowledge Skills; VT Skills = Vocational and Technical Skills.

Unemployment with advanced education provides a measure of how supportive the enabling environment is for fostering higher skills, and Gender development gap increases the scope of the Gender Equality component in that it covers gender differences in health and knowledge as well as gender income differences (which was the sole focus of the dropped Gender earnings gap indicator).

This year's model includes a total of 70 variables, up from 68 indicators used in the GTCI 2019. Country coverage has also increased—from 125 to 132 countries—representing 97% of the world's GDP and 94% of its population. The audit carried out by the JRC of the European Commission (see Chapter 6) has confirmed that the changes introduced in the model have improved its accuracy, while maintaining its solidity and robustness. Further details of the variable definitions and the method of calculation can be found in the Sources and Definitions and Technical Notes sections in the Appendices. Improvements will continue to be made to the GTCI model in the future, based on further discussions with academics and business and government leaders, as well as feedback from users of the GTCI.

GLOBAL TALENT COMPETITIVENESS INDEX 2020: MAIN FINDINGS

The top positions in the ranking of the GTCI scores continue to be dominated by developed, high-income countries (see Table 1 on pages 12–14), and there is a high correlation between GDP per capita and GTCI scores (see Figure 6 on pages

15–16. The Statistical Annex to this chapter presents more detailed information on country performance for the different sub-pillars and variables. European countries continue to dominate the GTCI rankings; 17 of them are in the top 25. Switzerland maintains its position at the top again this year, followed by the United States and Singapore. The other non-European countries that make the top 25 are Australia, Canada, New Zealand, Japan, Israel, and the United Arab Emirates.

An assessment of the top 15 countries in this ranking can be found in the Statistical Annex, along with an analysis and commentary on performances in the GTCI by income group and by region.

LONGER-TERM TRENDS IN TALENT COMPETITIVENESS

Last year's report included the first time-series analysis of GTCI data in order to assess how talent competitiveness is changing globally. Two main conclusions were drawn. First, that talent inequalities appear to be broadening, as reflected by a widening gap between the talent champions and the rest. Second, that more talent competitive countries are, in general, more stable in their performances than countries lower down the rankings. Both these takeaways remain just as valid in this year's updated analysis.

The approach used to analyse the time-series is unchanged from last year. It is based on comparing performances in the GTCI over two three-year periods: 2015–2017 against 2018–2020.²²

Table 1

Global Talent Competitiveness Index 2020 rankings

COUNTRY	SCORE	OVERALL RANK	INCOME GROUP	REGIONAL GROUP	REGIONAL GROUP RANK
Switzerland	81.26	1	High income	Europe	1
United States of America	79.09	2	High income	Northern America	1
Singapore	78.48	3	High income	Eastern, Southeastern Asia and Oceania	1
Sweden	75.82	4	High income	Europe	2
Denmark	75.18	5	High income	Europe	3
Netherlands	74.99	6	High income	Europe	4
Finland	74.47	7	High income	Europe	5
Luxembourg	73.94	8	High income	Europe	6
Norway	72.91	9	High income	Europe	7
Australia	72.53	10	High income	Eastern, Southeastern Asia and Oceania	2
Germany	72.34	11	High income	Europe	8
United Kingdom	72.27	12	High income	Europe	9
Canada	71.26	13	High income	Northern America	2
Iceland	70.90	14	High income	Europe	10
Ireland	70.45	15	High income	Europe	11
New Zealand	69.84	16	High income	Eastern, Southeastern Asia and Oceania	3
Austria	68.87	17	High income	Europe	12
Belgium	68.87	18	High income	Europe	13
Japan	66.06	19	High income	Eastern, Southeastern Asia and Oceania	4
Israel	65.66	20	High income	Northern Africa and Western Asia	1
France	64.83	21	High income	Europe	14
United Arab Emirates	62.63	22	High income	Northern Africa and Western Asia	2
Malta	62.02	23	High income	Europe	15
Estonia	61.97	24	High income	Europe	16
Czech Republic	60.91	25	High income	Europe	17
Malaysia	60.04	26	Upper-middle income	Eastern, Southeastern Asia and Oceania	5
Korea, Rep.	59.59	27	High income	Eastern, Southeastern Asia and Oceania	6
Portugal	57.80	28	High income	Europe	18
Qatar	57.74	29	High income	Northern Africa and Western Asia	3
Cyprus	57.47	30	High income	Northern Africa and Western Asia	4
Slovenia	57.42	31	High income	Europe	19
Spain	55.70	32	High income	Europe	20
Latvia	54.40	33	High income	Europe	21
Chile	53.96	34	High income	Latin America and the Caribbean	1
Lithuania	53.32	35	High income	Europe	22
Italy	52.91	36	High income	Europe	23
Costa Rica	52.29	37	Upper-middle income	Latin America and the Caribbean	2
Brunei Darussalam	52.17	38	High income	Eastern, Southeastern Asia and Oceania	7
Slovakia	52.08	39	High income	Europe	24
Saudi Arabia	51.48	40	High income	Northern Africa and Western Asia	5
Bahrain	50.35	41	High income	Northern Africa and Western Asia	6
China	49.64	42	Upper-middle income	Eastern, Southeastern Asia and Oceania	8
Oman	49.63	43	High income	Northern Africa and Western Asia	7
Poland	49.48	44	High income	Europe	25

(continued on next page)

Table 1 (continued)

Global Talent Competitiveness Index 2020 rankings

COUNTRY	SCORE	OVERALL RANK	INCOME GROUP	REGIONAL GROUP	REGIONAL GROUP RANK
Azerbaijan	48.57	45	Upper-middle income	Northern Africa and Western Asia	8
Philippines	47.52	46	Lower-middle income	Eastern, Southeastern Asia and Oceania	9
Greece	47.51	47	High income	Europe	26
Russian Federation	47.07	48	Upper-middle income	Europe	27
Mauritius	46.96	49	Upper-middle income	Sub-Saharan Africa	1
Trinidad and Tobago	46.78	50	High income	Latin America and the Caribbean	3
Uruguay	46.76	51	High income	Latin America and the Caribbean	4
Hungary	46.62	52	High income	Europe	28
Montenegro	46.32	53	Upper-middle income	Europe	29
Kazakhstan	46.02	54	Upper-middle income	Central and Southern Asia	1
Bulgaria	45.76	55	Upper-middle income	Europe	30
Argentina	45.33	56	Upper-middle income	Latin America and the Caribbean	5
Jamaica	44.00	57	Upper-middle income	Latin America and the Caribbean	6
Serbia	43.80	58	Upper-middle income	Europe	31
Croatia	43.53	59	High income	Europe	32
Armenia	43.52	60	Upper-middle income	Northern Africa and Western Asia	9
Jordan	43.48	61	Upper-middle income	Northern Africa and Western Asia	10
Panama	43.14	62	High income	Latin America and the Caribbean	7
Kuwait	42.65	63	High income	Northern Africa and Western Asia	11
Romania	42.14	64	Upper-middle income	Europe	33
Indonesia	41.81	65	Lower-middle income	Eastern, Southeastern Asia and Oceania	10
Ukraine	41.47	66	Lower-middle income	Europe	34
Thailand	41.30	67	Upper-middle income	Eastern, Southeastern Asia and Oceania	11
Georgia	41.11	68	Upper-middle income	Northern Africa and Western Asia	12
Mexico	41.03	69	Upper-middle income	Latin America and the Caribbean	8
South Africa	40.85	70	Upper-middle income	Sub-Saharan Africa	2
Botswana	40.71	71	Upper-middle income	Sub-Saharan Africa	3
India	40.42	72	Lower-middle income	Central and Southern Asia	2
Namibia	40.22	73	Upper-middle income	Sub-Saharan Africa	4
Colombia	39.85	74	Upper-middle income	Latin America and the Caribbean	9
Mongolia	39.62	75	Lower-middle income	Eastern, Southeastern Asia and Oceania	12
Albania	38.94	76	Upper-middle income	Europe	35
Peru	38.68	77	Upper-middle income	Latin America and the Caribbean	10
Turkey	38.37	78	Upper-middle income	Northern Africa and Western Asia	13
Tunisia	38.25	79	Lower-middle income	Northern Africa and Western Asia	14
Brazil	38.14	80	Upper-middle income	Latin America and the Caribbean	11
Dominican Republic	37.29	81	Upper-middle income	Latin America and the Caribbean	12
Ecuador	37.22	82	Upper-middle income	Latin America and the Caribbean	13
Sri Lanka	36.95	83	Upper-middle income	Central and Southern Asia	3
Tajikistan	36.89	84	Low income	Central and Southern Asia	4
Gambia	36.66	85	Low income	Sub-Saharan Africa	5
Moldova, Rep.	36.64	86	Lower-middle income	Europe	36
Ghana	36.45	87	Lower-middle income	Sub-Saharan Africa	6
Kenya	36.42	88	Lower-middle income	Sub-Saharan Africa	7

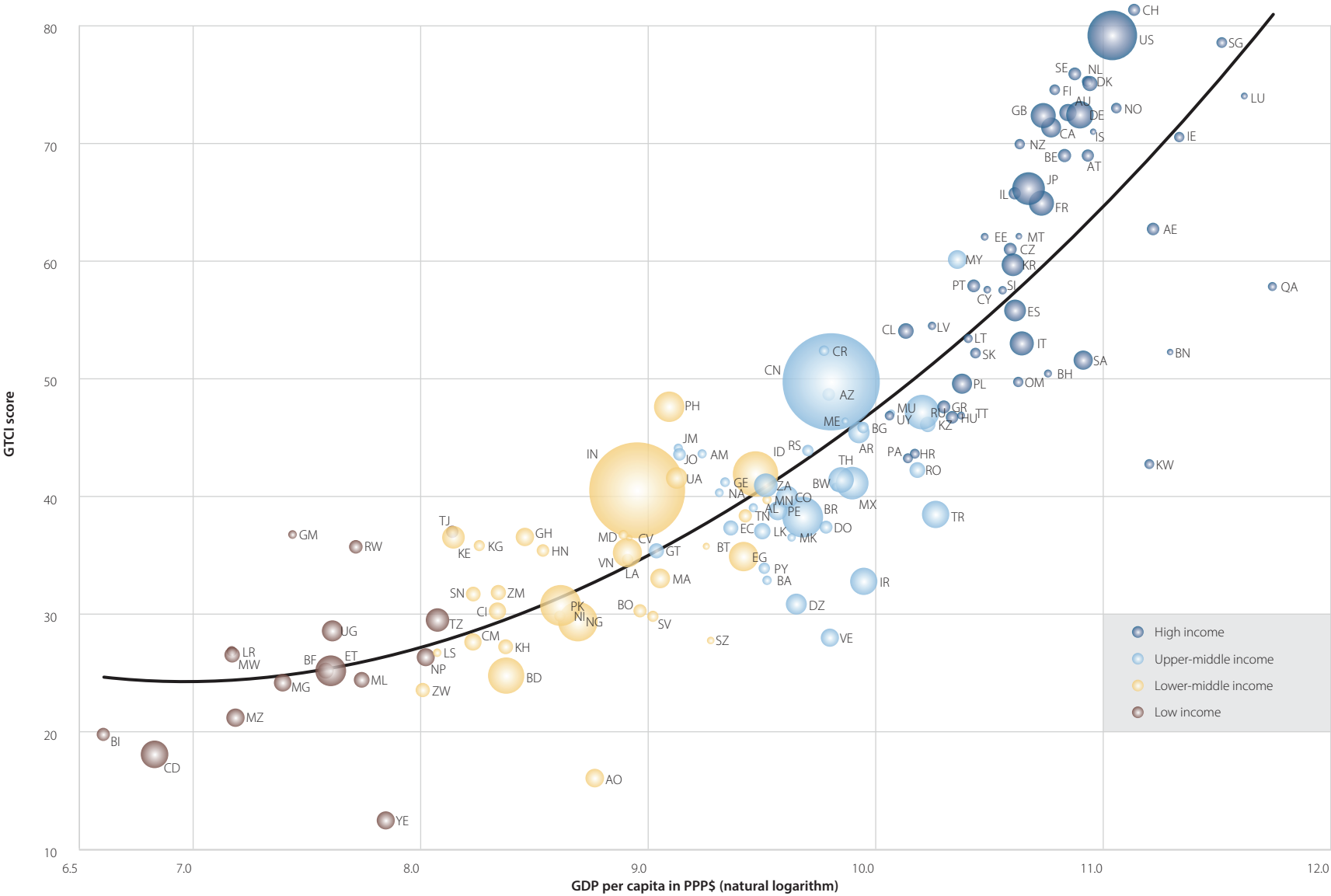
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Table 1 (continued)

Global Talent Competitiveness Index 2020 rankings

COUNTRY	SCORE	OVERALL RANK	INCOME GROUP	REGIONAL GROUP	REGIONAL GROUP RANK
North Macedonia	36.42	89	Upper-middle income	Europe	37
Cabo Verde	36.38	90	Lower-middle income	Sub-Saharan Africa	8
Kyrgyzstan	35.72	91	Lower-middle income	Central and Southern Asia	5
Bhutan	35.66	92	Lower-middle income	Central and Southern Asia	6
Rwanda	35.62	93	Low income	Sub-Saharan Africa	9
Honduras	35.31	94	Lower-middle income	Latin America and the Caribbean	14
Guatemala	35.28	95	Upper-middle income	Latin America and the Caribbean	15
Viet Nam	35.11	96	Lower-middle income	Eastern, Southeastern Asia and Oceania	13
Egypt	34.79	97	Lower-middle income	Northern Africa and Western Asia	15
Lao PDR	34.54	98	Lower-middle income	Eastern, Southeastern Asia and Oceania	14
Paraguay	33.80	99	Upper-middle income	Latin America and the Caribbean	16
Morocco	32.93	100	Lower-middle income	Northern Africa and Western Asia	16
Bosnia and Herzegovina	32.77	101	Upper-middle income	Europe	38
Iran, Islamic Rep.	32.68	102	Upper-middle income	Central and Southern Asia	7
Zambia	31.73	103	Lower-middle income	Sub-Saharan Africa	10
Senegal	31.60	104	Lower-middle income	Sub-Saharan Africa	11
Algeria	30.75	105	Upper-middle income	Northern Africa and Western Asia	17
Pakistan	30.63	106	Lower-middle income	Central and Southern Asia	8
Bolivia, Plurinational St.	30.18	107	Lower-middle income	Latin America and the Caribbean	17
Côte d'Ivoire	30.16	108	Lower-middle income	Sub-Saharan Africa	12
Nicaragua	29.73	109	Lower-middle income	Latin America and the Caribbean	18
El Salvador	29.71	110	Lower-middle income	Latin America and the Caribbean	19
Tanzania, United Rep.	29.40	111	Low income	Sub-Saharan Africa	13
Nigeria	29.26	112	Lower-middle income	Sub-Saharan Africa	14
Uganda	28.47	113	Low income	Sub-Saharan Africa	15
Venezuela, Bolivarian Rep.	27.89	114	Upper-middle income	Latin America and the Caribbean	20
Eswatini	27.66	115	Lower-middle income	Sub-Saharan Africa	16
Cameroon	27.53	116	Lower-middle income	Sub-Saharan Africa	17
Cambodia	27.12	117	Lower-middle income	Eastern, Southeastern Asia and Oceania	15
Liberia	26.74	118	Low income	Sub-Saharan Africa	18
Lesotho	26.62	119	Lower-middle income	Sub-Saharan Africa	19
Malawi	26.44	120	Low income	Sub-Saharan Africa	20
Nepal	26.23	121	Low income	Central and Southern Asia	9
Burkina Faso	25.09	122	Low income	Sub-Saharan Africa	21
Ethiopia	25.08	123	Low income	Sub-Saharan Africa	22
Bangladesh	24.67	124	Lower-middle income	Central and Southern Asia	10
Mali	24.31	125	Low income	Sub-Saharan Africa	23
Madagascar	24.06	126	Low income	Sub-Saharan Africa	24
Zimbabwe	23.44	127	Lower-middle income	Sub-Saharan Africa	25
Mozambique	21.09	128	Low income	Sub-Saharan Africa	26
Burundi	19.67	129	Low income	Sub-Saharan Africa	27
Congo, Dem. Rep.	17.98	130	Low income	Sub-Saharan Africa	28
Angola	15.96	131	Lower-middle income	Sub-Saharan Africa	29
Yemen	12.36	132	Low income	Northern Africa and Western Asia	18

Figure 6
GTCI scores versus GDP per capita



Note: GDP per capita in PPP\$ and population data (represented by the size of the bubbles) are for 2018 or the latest year available. The data are drawn from the World Bank's World Development Indicators database. The trend line is a polynomial of degree two ($R^2 = 0.78$).

Figure 6 (continued)

GTCI scores versus GDP per capita: ISO-2 country codes

CODE	COUNTRY	CODE	COUNTRY	CODE	COUNTRY	CODE	COUNTRY	CODE	COUNTRY
AE	United Arab Emirates	CO	Colombia	IL	Israel	MN	Mongolia	SA	Saudi Arabia
AL	Albania	CR	Costa Rica	IN	India	MT	Malta	SE	Sweden
AM	Armenia	CV	Cabo Verde	IR	Iran, Islamic Rep.	MU	Mauritius	SG	Singapore
AO	Angola	CY	Cyprus	IS	Iceland	MW	Malawi	SI	Slovenia
AR	Argentina	CZ	Czech Republic	IT	Italy	MX	Mexico	SK	Slovakia
AT	Austria	DE	Germany	JM	Jamaica	MY	Malaysia	SN	Senegal
AU	Australia	DK	Denmark	JO	Jordan	MZ	Mozambique	SV	El Salvador
AZ	Azerbaijan	DO	Dominican Republic	JP	Japan	NA	Namibia	SZ	Eswatini
BA	Bosnia and Herzegovina	DZ	Algeria	KE	Kenya	NG	Nigeria	TH	Thailand
BD	Bangladesh	EC	Ecuador	KG	Kyrgyzstan	NI	Nicaragua	TJ	Tajikistan
BE	Belgium	EE	Estonia	KH	Cambodia	NL	Netherlands	TN	Tunisia
BF	Burkina Faso	EG	Egypt	KR	Korea, Rep.	NO	Norway	TR	Turkey
BG	Bulgaria	ES	Spain	KW	Kuwait	NP	Nepal	TT	Trinidad and Tobago
BH	Bahrain	ET	Ethiopia	KZ	Kazakhstan	NZ	New Zealand	TZ	Tanzania, United Rep.
BI	Burundi	FI	Finland	LA	Lao PDR	OM	Oman	UA	Ukraine
BN	Brunei Darussalam	FR	France	LK	Sri Lanka	PA	Panama	UG	Uganda
BO	Bolivia, Plurinational St.	GB	United Kingdom	LR	Liberia	PE	Peru	US	United States of America
BR	Brazil	GE	Georgia	LS	Lesotho	PH	Philippines	UY	Uruguay
BT	Bhutan	GH	Ghana	LT	Lithuania	PK	Pakistan	VE	Venezuela, Bolivarian Rep.
BW	Botswana	GM	Gambia	LU	Luxembourg	PL	Poland	VN	Viet Nam
CA	Canada	GR	Greece	LV	Latvia	PT	Portugal	YE	Yemen
CD	Congo, Dem. Rep.	GT	Guatemala	MA	Morocco	PY	Paraguay	ZA	South Africa
CH	Switzerland	HN	Honduras	MD	Moldova, Rep.	QA	Qatar	ZM	Zambia
CI	Côte d'Ivoire	HR	Croatia	ME	Montenegro	RO	Romania	ZW	Zimbabwe
CL	Chile	HU	Hungary	MG	Madagascar	RS	Serbia		
CM	Cameroon	ID	Indonesia	MK	North Macedonia	RU	Russian Federation		
CN	China	IE	Ireland	ML	Mali	RW	Rwanda		

Focusing on these two averages leads to several advantages. For instance, it can make it easier to spot general trends that might be missed in a year-by-year analysis. In addition, it allows for some smoothing of annual fluctuations in the data that, in turn, results in more reliable conclusions. Related to this is that the aggregation absorbs year-to-year changes because of improvements in the methodology of GTCI.²³

Only countries that feature in all of the most recent six GTCI reports are included in the analysis: all in all, 88 countries. Of these, 41 are high-income countries, 28 are upper-middle-income countries, 17 are lower-middle-income countries, and 2 are low-income countries. The regional breakdown, meanwhile, is the following: 7 are in Central and Southern Asia; 13 in Eastern, Southeastern Asia and Oceania; 33 in Europe; 16 in Latin America and the Caribbean; 11 in Northern Africa and Western Asia; 2 in Northern America; and 6 in Sub-Saharan Africa.

The calculation of the averages of the two three-year periods is based on the GTCI scores that the countries have achieved. More specifically, the calculation comprises two simple steps: (1) averaging overall GTCI scores for 2015–2017 and 2018–2020, respectively, and (2) computing country rankings based on the resulting averages. The advantage of this approach is that it is straightforward and yields distinct rankings for each country. The drawback is that the scores are not necessarily fully comparable from one year to the next because of changes in data or methodological improvements. An alternative approach that does not suffer from this drawback would be to calculate the averages based on relative rankings rather than absolute scores. That is, rankings for the 88 countries would first be computed for each single year before being averaged across the two three-year periods. These averages would then form the basis for the rankings of 2015–2017 and 2018–2020, respectively.²⁴ However, a problem with this approach is that it yields many ties (i.e., two or more countries with the same ranking), which makes the analysis less clear. In the end, therefore, the results presented in this section stem from an analysis based on the first approach, while the second approach is used to corroborate the findings.

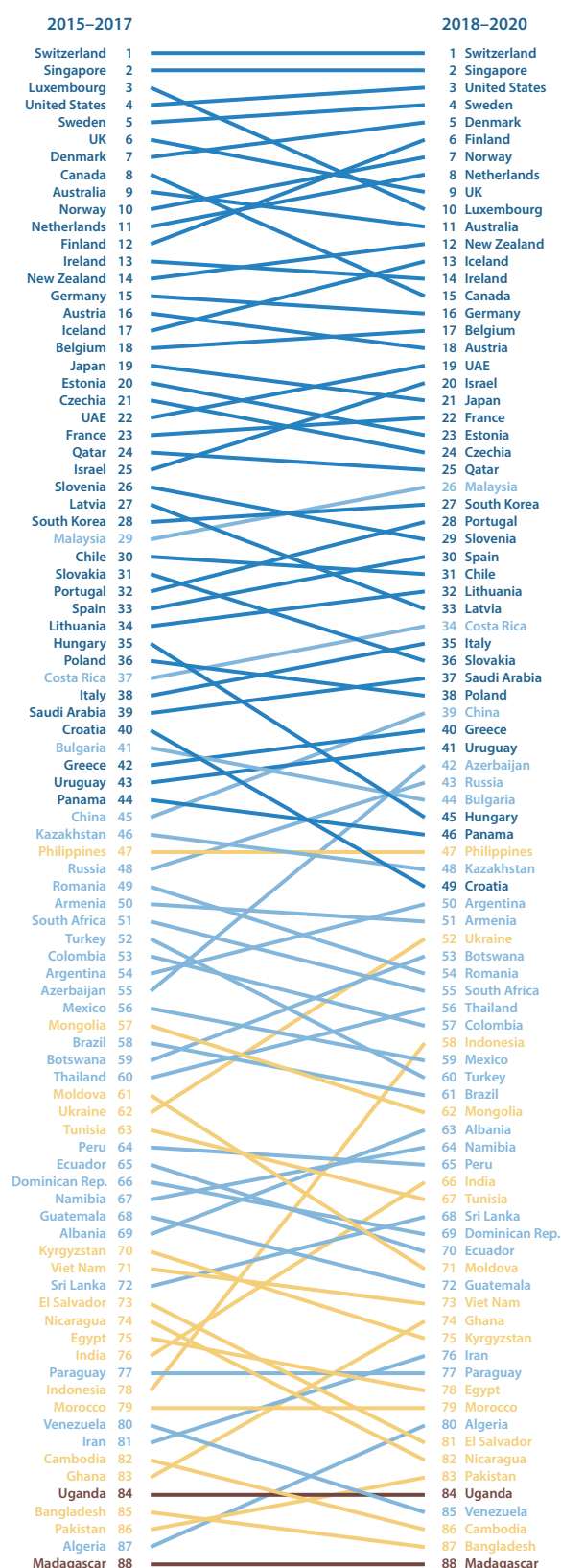
Of Talent Champions, Movers, Limpers, and Laggards

Figure 7 depicts visually how the relative positions of countries in the GTCI have changed in the two periods 2015–2017 and 2018–2020. The left-hand and right-hand columns of the figure rank the countries according to their GTCI scores in the earlier and latter periods, respectively. Hence, an upward (downward) slope implies an improvement (deterioration) in the ranking over the two periods, which in turn suggests strengthening (weakening) talent competitiveness.

Each of the five top-ranked countries for the period 2018–2020 either retained its position or improved it over the earlier three-year period. The three countries that follow—Finland, Norway, and the Netherlands—appear to have strengthened their talent competitiveness, while the opposite seems to hold for the last two countries in the top 10, the United Kingdom and Luxembourg.

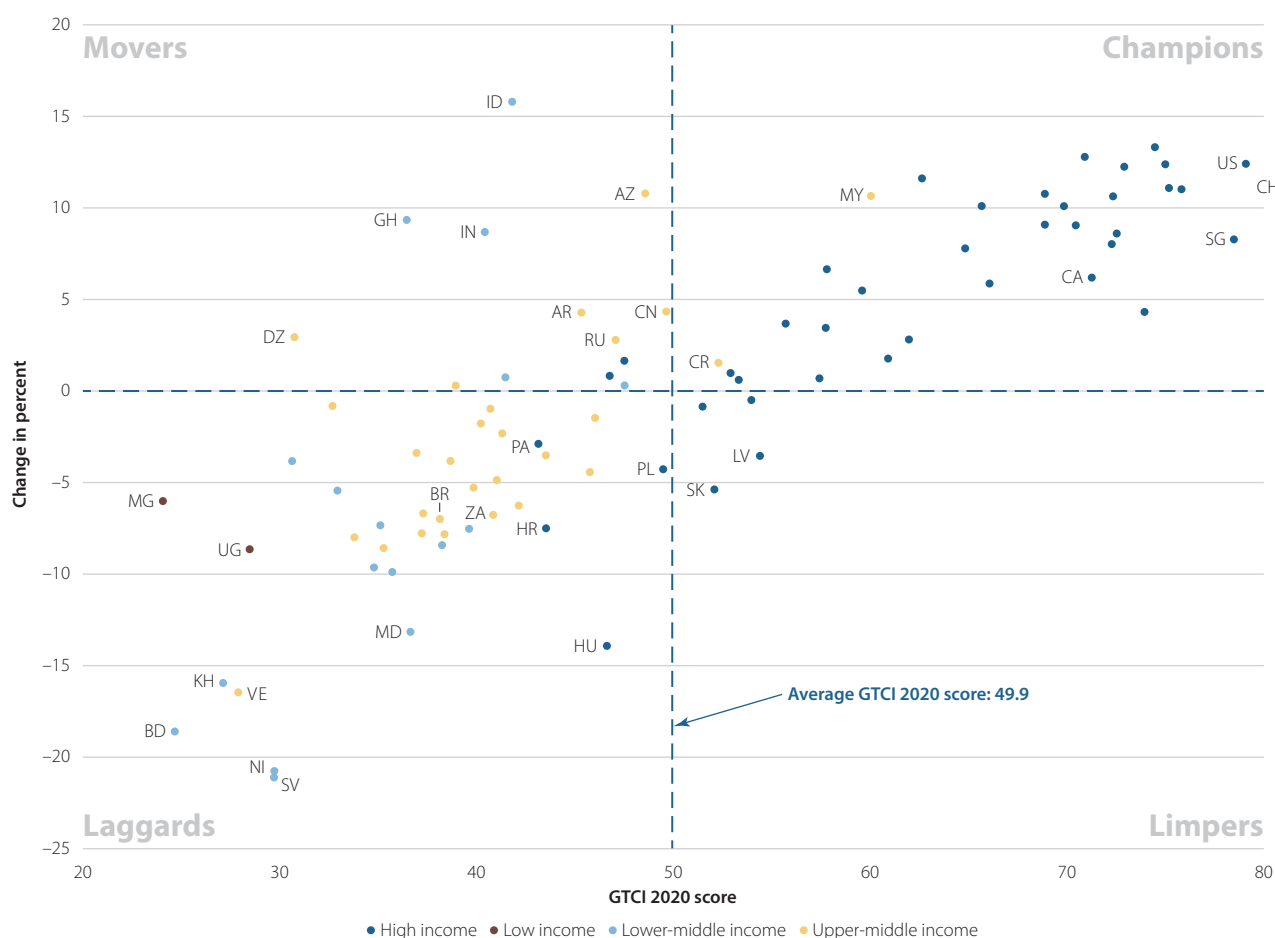
Figure 7

GTCI rankings in 2015–2017 and 2018–2020



Note: Colours refer to income groups, which range from dark blue (high income) to light blue (upper-middle income), light brown (lower-middle income), and dark brown (low income).

Figure 8

Change in scores for 2015–2017 vs 2018–2020 and GTCI 2020 score

Note: A complete ISO-2 country code key can be found as part of Figure 6, page 16.

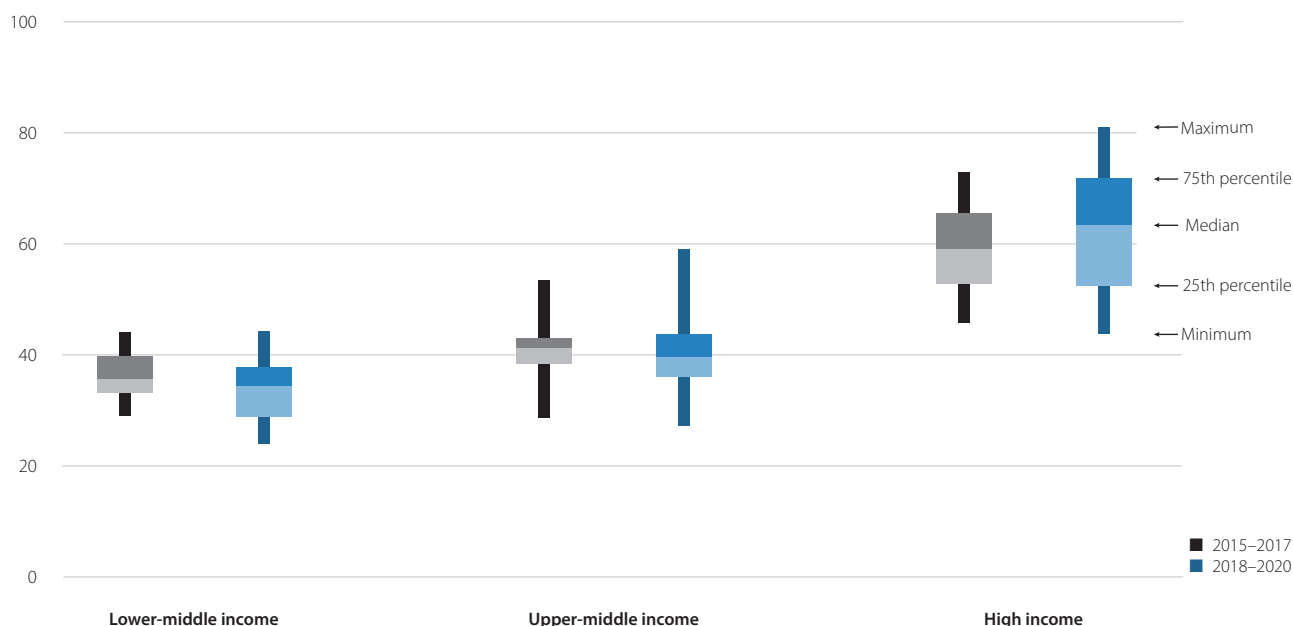
One of the two key messages last year was, as mentioned above, that countries' positions over the two three-year periods tend to fluctuate more at lower rankings. Indeed, as one's eyes move from top to bottom of the slope graph in Figure 7, it seems as if the criss-crosses become increasingly pronounced. For instance, it can be seen that seven of the top 10 countries in 2015–2017 were also in the top 10 in 2018–2020, which is the highest share of any of the following 10-country groups (i.e., 11–20, 21–30, etc.). This impression is corroborated by an analysis of the frequency and magnitudes of changes in rankings within various percentiles.

Figure 7 shows how relative positions over the two three-year periods have changed, but it does not provide any information about how scores have evolved. Figure 8 does so by showing two aspects of each country's scores: (1) the change (in percent) of its average GTCI scores from 2015–2017 to 2018–2020 and (2) what score it achieved in this year's ranking. Plotting this information shows how countries fare against a combined benchmark of zero change for the two three-year periods and of the average 2020 score (49.9) for this set of countries. The resulting four quadrants are meant to indicate whether a country

is primarily a *talent champion* (with an improved score over the two periods and a high score in the GTCI 2020), a *talent mover* (an improved score over time, but a low score this year), a *talent limper* (a worsened score over time, but a high score this year), or a *talent laggard* (a worsened score over time and a low score this year).

As can be seen in the scatter plot (Figure 8), most high-income countries are talent champions. Even countries such as Ireland and Luxembourg—which have fallen in the rankings over the two periods—have achieved improved GTCI scores, albeit at a lower rate than other leading countries. Most upper-middle-income countries are considered to be talent laggards even if a few of them are placed in the talent mover quadrant, and two—Malaysia and Costa Rica—are regarded as talent champions. Similarly, the majority of lower-middle-income countries are found in the talent laggards' quadrant. The two low-income countries—Madagascar and Uganda—are deemed talent laggards, although there are several countries from the other three income groups that have seen their scores worsen over the two three-year periods.

Figure 9

GTCI scores in 2015–2017 and 2018–2020 by income group

Note: Narrow bars indicate maximum and minimum values; wide bars indicate 25th, 50th, and 75th percentiles. Black bars indicate 2015–2017 values and blue bars indicate 2018–2020 values. There are only two low-income countries in the analysis, so that income group has been excluded.

The pacesetter over the two periods is Indonesia, a lower-middle-income country that has seen improvements in all pillars but Global Knowledge Skills. Two other impressive lower-middle-income talent movers in the time period under discussion are Ghana and India, where the former country has benefited from improved showings in the pillars related to Attract and VT Skills and the latter has primarily enjoyed a boost in scores concerning the Grow, Retain, and VT Skills dimensions. Two lower-middle-income countries that stand in stark contrast to these talent movers are El Salvador and Nicaragua: They are talent laggards with average scores that are more than 20% lower in 2018–2020. Both countries experienced lower scores in each of the six pillars.

The two upper-middle-income countries that are regarded as talent champions—Costa Rica and Malaysia—have both improved their ability to retain talent and their pools of VT Skills. Malaysia has also strengthened its scores in the Attract pillar. China, which is almost as much a talent champion as a talent mover, has primarily been boosted by better showings in the Grow and Retain pillars. The worst-performing upper-middle-income country is Venezuela, which has primarily suffered from a worsening ability to enable and attract talent.

Most high-income countries are talent champions, including the top 3 of Switzerland, the United States, and Singapore, which saw their average scores over the two time periods grow by close to 10% or more. Four high-income countries fall into the talent laggards category: Croatia, Hungary, Panama, and Poland. They all have in common disappointing results in the Output-related pillars—that is, VT Skills and GK Skills. Hungary has seen the worst drop in overall scores (almost 14%), as performances have worsened in each pillar.

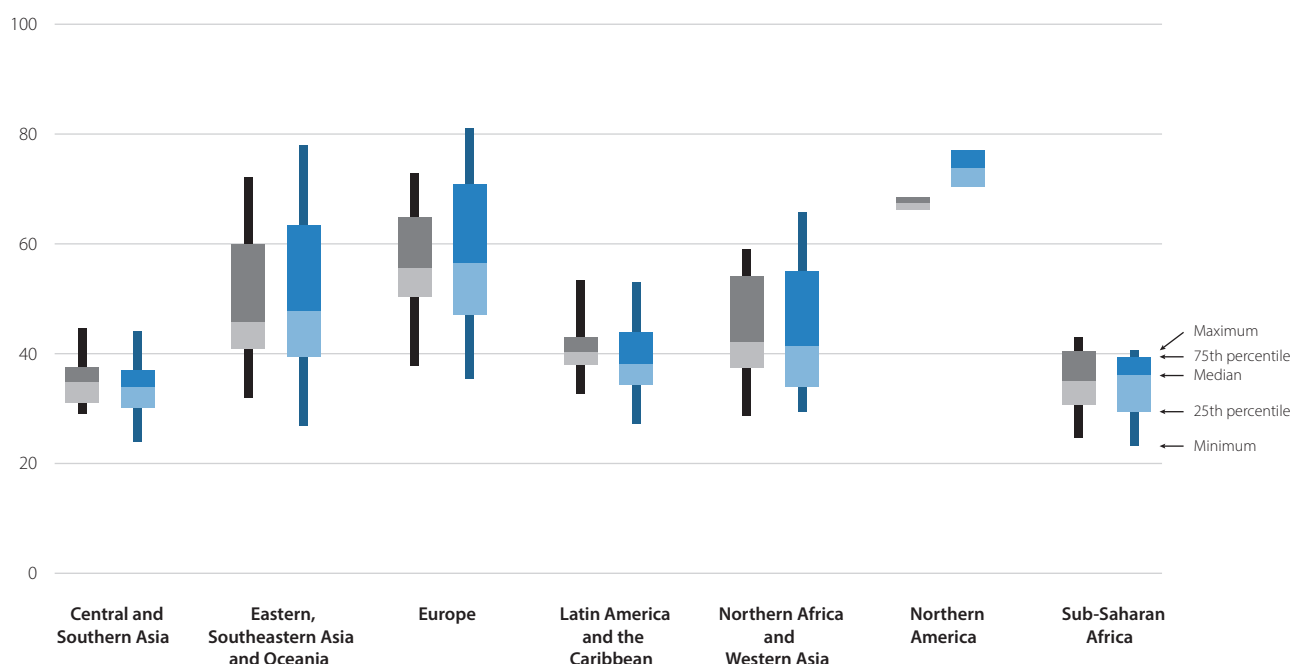
An Ever-Widening Gap between Talent Champions and the Rest?

In view of Figure 8 and the way the GTCI scores of many high-income countries have improved over the years, while the opposite seems to hold for most lower-income countries, it is only to be expected to see this reflected in an analysis of performances by income group. Figures 9 and 10 show that this is indeed the case by depicting the distributions of GTCI scores for the two three-year periods by income group and region, respectively.

In both figures, it is the groups with higher scores that have primarily improved their scores—at least at the 50th, 75th, and 100th percentiles. This is clearly the case in terms of income group, where high-income countries have a greater median score in the latter period, while the upper-middle-income and lower-middle-income groups have lower median scores (the group of low-income countries has been excluded because it includes only two countries). Similarly, the three highest-scoring regions—Eastern, Southeastern Asia and Oceania, Europe, and Northern America—have improved their median scores over the two periods, whereas Central and Southern Asia, Latin America and the Caribbean, and Northern Asia and Western Africa have seen their corresponding values decline. Some encouragement can be had from the higher median of the group of countries from Sub-Saharan Africa, although the other displayed percentiles have all worsened.

The upshot is that the gap between the talent champions and the rest of the countries is significant and, more worryingly, it seems to be on the increase. This was already highlighted in last year's report, which attributed the widening gap to two opposing trends: talent competitiveness strengthening in groups

Figure 10
GTCI scores in 2015–2017 and 2018–2020 by regional group



Note: Narrow bars indicate maximum and minimum values; wide bars indicate 25th, 50th, and 75th percentiles (the figure for Northern America has only two bars because it contains only two countries: Canada and the United States).

of countries where it is already comparatively high and weakening in those where it is relatively low. In order to effectively address this growing gap, it will be imperative to see whether this trend continues in the near future. The GTCI time-series analysis will be an important part of assessing this.

As the GTCI time series continue to grow, their analysis will offer additional possibilities to deepen the initial approach offered here. Considering ways in which individual countries and groups have changed along specific pillars and variables of the GTCI model appears to be a particularly promising way to identify trends as well as to draw additional policy conclusions about how the various components of talent competitiveness can be better fostered. This will remain a key objective of the GTCI report in coming years.

ENDNOTES

- 1 Lanvin & Evans, eds. (2017)
- 2 J. McCarthy et al., 31 August 1955, Dartmouth AI Project Proposal, available at https://www.livinginternet.com/i/ii_ai.htm
- 3 See Lanvin & Miroux (2019).
- 4 Biases can be expected from AI, however. This is likely to be the case when the algorithms on which it is based have been programmed by a specific group that is less diverse (culturally, technically, or philosophically) than the general population. It has been underlined, for example, that the relatively small number of female programmers involved in AI projects might create such biases. See, for example, Cairns (2019).
- 5 This is amply demonstrated by Daniel Kahneman and Amos Tversky (see Kahneman & Tversky 1979).
- 6 See <https://www.tengai-unbiased.com/ai-robot-tengai-unbiased-first-independent-job-interview/>
- 7 See Greenfield (2018).
- 8 Dramatic estimates provided by Eric Brynjolfsson and Andrew McAfee of the number of jobs threatened by automation and AI—see Brynjolfsson & McAfee (2014)—have been later mitigated by the OECD and others; see OECD (2018). Kai-Fu Lee has criticised both approaches as underestimating some ‘organic adaptation mechanisms’; see Lee (2018). All agree, however, that, whatever the angle chosen, the anticipated effects of AI on jobs will be quantitatively and qualitatively massive.
- 9 Roose (2019).
- 10 See Daugherty & Wilson (2018).
- 11 Daugherty & Wilson (2018), p. 191.
- 12 See Financial Times (2019).
- 13 For the French approach, see Villani (2018); for the European approach see Servoz (2018).
- 14 See Dutton (2018), as well as the National and International AI Strategies portal of the Future of Life institute, available at <https://futureoflife.org/national-international-ai-strategies/>
- 15 Interview to the New York Times (2019), <https://www.nytimes.com/paidpost/imda/singapores-governing-framework-for-artificial-intelligence.html>
- 16 Idem.
- 17 See the Talent Development portal on the AI Singapore website at <https://www.aisingapore.org/talentdevelopment/>
- 18 See Element AI (2019).
- 19 See Lee (2019).
- 20 Lee (2019), p. 91.
- 21 See Cappelli & Keller (2014); Stahl et al. (2012).
- 22 The years 2015, 2016, and 2017 refer to the results reported in *The Global Talent Competitiveness Index 2014*, *The Global Talent Competitiveness Index 2015–16*, and *The Global Talent Competitiveness Index 2017*, respectively.

The reason for the apparent year discrepancy is as follows. The GTCI reports are always printed towards the end of the calendar year. The first two editions of the GTCI referred to this in their titles (*The Global Talent Competitiveness Index 2013* and *The Global Talent Competitiveness Index 2014*). However, because the launch of the report is held in January, a change was made in the third edition, whereby the title would refer to the launch year. Thus, the third edition became *The Global Talent Competitiveness Index 2015–16*; the three subsequent editions were entitled *The Global Talent Competitiveness Index 2017*, *The Global Talent Competitiveness Index 2018*, and *The Global Talent Competitiveness Index 2019*.

- 23 One caveat to the results discussed in this section is that the GTCI model has evolved over the years, with the possible implication that a score that changes from one year to the next might primarily be a reflection of a methodological adjustment rather than new data. This is less of a concern from the second GTCI edition onwards (which is analysed here), since the model has been become increasingly stable over the years. Moreover, this potential problem is addressed by the averaging of scores across three years (as it implies some smoothing of modifications to the GTCI model) and by focusing the analysis on aggregate overall GTCI scores (which entails a degree of cancelling-out effects).
- 24 More concretely, the country with the best average rank for a three-year period would be ranked 1st, the country with the next-best rank would be ranked 2nd, and so on.

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Statistical Annex to Chapter 1

OVERVIEW

The statistics in this annex analyse country performance in the GTCI 2020 in terms of its overall score and also in terms of its pillars and sub-pillars. Performance data are broken down in different ways: by top performers (the top 15 GTCI score leaders) and by region and income group (high, upper-middle, lower-middle, and low income).¹

In total, there are 132 countries included in this year's GTCI, up from last year's 125. Of these, 48 are high-income countries, 36 are upper-middle-income countries, 32 are lower-middle-income countries, and 16 are low-income countries. The regional distribution, meanwhile, is as follows: 10 countries from Central and Southern Asia, 15 countries from Eastern, Southeastern Asia and Oceania, 38 countries from Europe, 20 countries from Latin America and the Caribbean, 18 countries from Northern Africa and Western Asia, 2 countries from Northern America, and 29 countries from Sub-Saharan Africa. Eight of the covered countries are new since the GTCI 2019 (Angola, the Plurinational State of Bolivia, Burkina Faso, Cabo Verde, Côte d'Ivoire, Eswatini, Jamaica, and North Macedonia), while one country (Lebanon) has dropped out of this year's index because of a lack of available data.

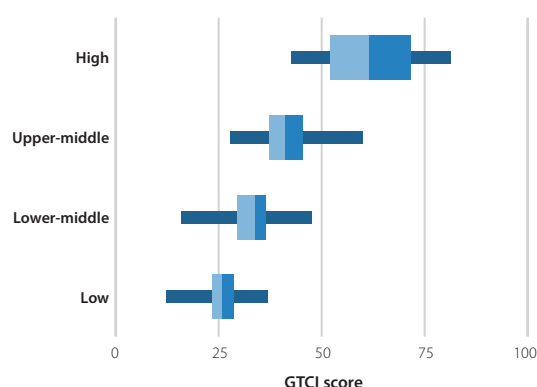
Figure A1 presents the dispersion of GTCI scores by income group and region. In terms of income group, the left panel provides another illustration of the positive relationship between GTCI score and GDP per capita, as it shows that higher-income-country groups outperform lower-income-country groups. The dominance of high-income countries is particularly striking, with the lowest-ranked country of that group having a higher GTCI score than the median upper-middle-income country. Scores by region naturally reflect the prevalence of types of income group. Thus, Northern America and Europe—with the greatest shares of high-income countries—are the two best-performing regions, followed by Eastern, Southeastern Asia and Oceania. Conversely, the two regions with the greatest shares of low-income and lower-middle-income countries—Sub-Saharan Africa and Central and Southern Asia—are the two worst-performing regions. Dispersion of GTCI scores within regions also reflects the variation of income groups that each region contains. This is especially the case for Eastern, Southeastern Asia and Oceania, Northern Africa and Western Asia, and Europe, which is evident from the widths of their wide and narrow bars in the figure.

At the country level, year-on-year changes in rankings are to be expected given data updates and the refinements to the

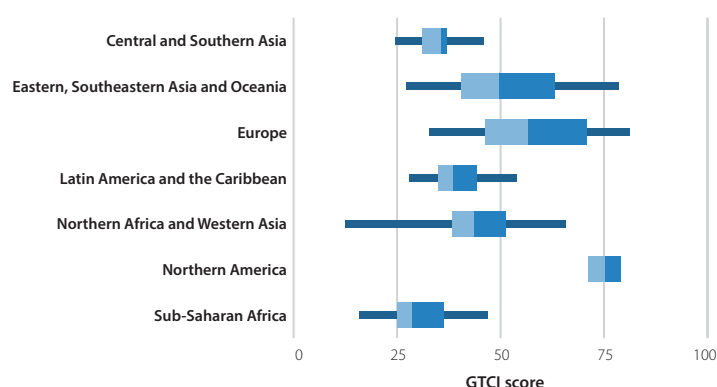
Figure A1

Country dispersion of GTCI scores

By income group



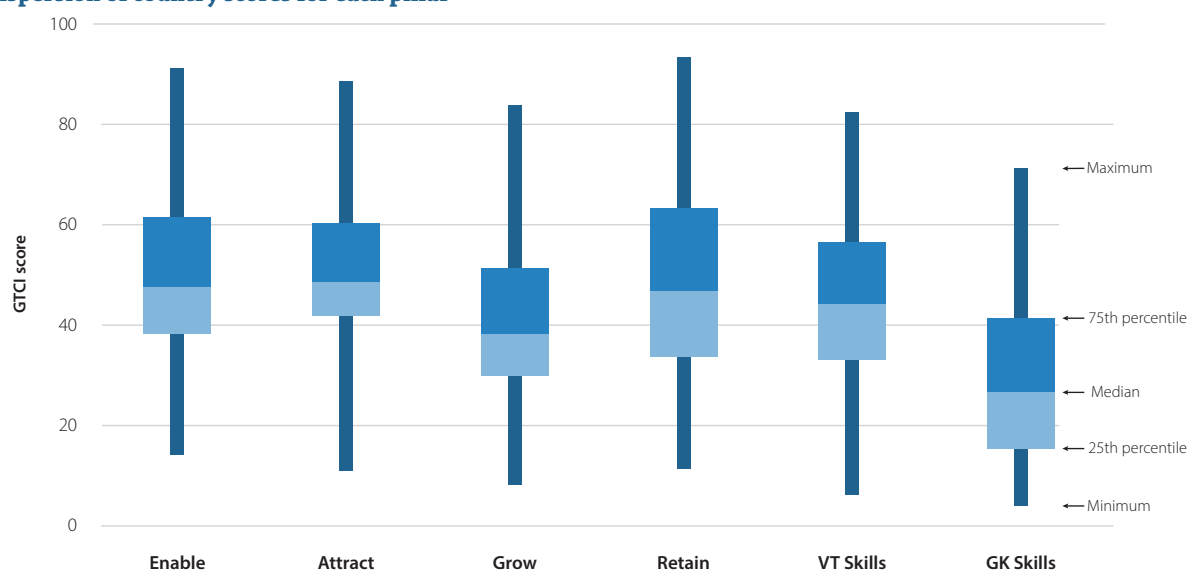
By region



Minimum 25th percentile Median 75th percentile Maximum

Note: Narrow bars indicate maximum and minimum values; wide bars indicate 25th, 50th, and 75th percentiles (the figure for Northern America has only two bars because it contains only two countries: Canada and the United States).

Figure A2

Dispersion of country scores for each pillar

Note: Narrow bars indicate maximum and minimum values; wide bars indicate 25th, 50th, and 75th percentiles. GK Skills = Global Knowledge Skills; VT Skills = Vocational and Technical Skills.

GTCI model. On the whole, however, the changes are usually small and countries are often ranked in the same quartile as they were the previous year. For instance, although there have been permutations among the top-25 ranked countries, the list of countries within that group is almost identical to that of last year (Qatar has dropped out of it, while Malta has broken into it). Something similar could be said about the bottom-25 ranked countries, taking into account the countries that are new additions to the index.

European countries continue to dominate the GTCI rankings, with 17 of them in the top 25 and Switzerland maintaining its position at the very top. Other top-scoring European countries include the Nordics (Sweden, 4th; Denmark, 5th; Finland, 7th; Norway, 9th; Iceland, 14th) and Western European countries such as the Netherlands (6th), Luxembourg (8th), and Germany (11th).

As for other regions, both Northern American countries are in the top 25 (United States of America, 2nd; Canada, 13th). Eastern and Southeastern Asia is represented by Singapore (3rd) and Japan (19th), while the two largest economies of Oceania (Australia, 10th; New Zealand, 16th) are also among the highest-scoring countries. The two remaining countries in the top 25 are Israel (20th) and the United Arab Emirates (22nd), both of which are located in Western Asia.

The discussion has so far focused on aggregate GTCI scores and rankings. Analysing scores by pillar sheds some light on what might be driving these overall results. Figure A2 therefore presents the dispersion of scores by pillar in terms of the five-number summary (the minimum, the lower quartile, the median, the upper quartile, and the maximum). As can be seen, there are clear differences in dispersion across the pillars. For instance, the dispersion of scores is largest in the Retain pillar (standard deviation = 20.3) and smallest in the Attract pillar

(standard deviation = 14.1), which suggests that the ability of countries to retain talent sets them apart more than their capacity to attract talent.

One might expect a certain degree of complementarity across pillars in that a strong performance in one dimension of talent has positive spillovers on other dimensions. Such a conjecture is supported by the heatmap of Figure A3 on pages 25–26, which presents the overall rankings in the GTCI and those in each pillar, coloured by the quartile to which the rankings of each of the 132 countries belong. The complementarities across pillars are most evident at the top and bottom of the figure, where countries that are among the best and worst performers in the overall GTCI rankings are also among the best and worst performers in the six pillars. In fact, the difference between overall GTCI rank and pillar-level rank is no higher than 10 in absolute value in at least four pillars for more than half of all countries in this year's index. To take a concrete example: Chile, which is ranked 34th overall, does not rank better than 26 or worse than 40 in any of the six pillars.

TOP 15 COUNTRIES IN THE GTCI 2020

The group of top-performing countries in the GTCI remains stable from year to year, notwithstanding some movement within the group. In fact, all countries but one in the top 15 of the GTCI 2020 were also in the top 15 in last year's index. Ireland (15th, up from 16th) is the new country in the list, while New Zealand has dropped out of it (16th, down from 11th). A similar story applies to the top 25, with Malta (rising from 26th to 23rd) and Qatar (falling from 24th to 29th) being the exceptions.

That there might exist complementarities across pillars certainly seems to be the case for the countries in the top 15, as they typically perform well in each of the six pillars of the GTCI model (Figure A3). More specifically, 5 of the 15 countries rank among

Figure A3

Heatmap: Rankings on GTCI overall and by pillar

COUNTRY	GTCI RANKING	ENABLE	ATTRACT	GROW	RETAIN	VT SKILLS	GK SKILLS
Countries ABOVE the median in the overall GTCI score							
Switzerland	1	2	6	2	1	2	4
United States	2	3	11	1	12	1	2
Singapore	3	1	1	8	24	5	1
Sweden	4	4	10	6	9	7	5
Denmark	5	6	14	7	3	10	6
Netherlands	6	5	15	3	7	6	16
Finland	7	10	13	4	8	4	15
Luxembourg	8	9	2	19	4	16	11
Norway	9	11	16	12	2	8	13
Australia	10	17	7	9	11	20	9
Germany	11	7	19	13	10	3	23
United Kingdom	12	15	12	5	17	24	3
Canada	13	14	8	11	20	19	14
Iceland	14	16	18	18	6	14	7
Ireland	15	21	9	14	13	11	12
New Zealand	16	12	5	15	18	26	17
Austria	17	13	24	16	5	9	25
Belgium	18	18	21	10	15	18	18
Japan	19	8	40	20	16	13	24
Israel	20	19	48	21	21	12	8
France	21	23	36	17	19	17	22
United Arab Emirates	22	22	3	24	29	31	38
Malta	23	27	20	37	14	37	21
Estonia	24	24	31	28	31	29	10
Czech Republic	25	25	33	27	22	21	30
Malaysia	26	26	28	23	34	15	33
South Korea	27	20	71	25	26	30	20
Portugal	28	29	26	32	25	43	35
Qatar	29	28	4	36	41	22	67
Cyprus	30	37	27	47	32	28	19
Slovenia	31	30	49	31	27	27	27
Spain	32	32	45	29	23	53	34
Latvia	33	35	43	39	38	35	28
Chile	34	38	39	26	40	36	40
Lithuania	35	31	42	35	46	58	26
Italy	36	42	67	33	28	33	42
Costa Rica	37	39	29	30	36	50	68
Brunei Darussalam	38	33	37	69	55	25	37
Slovakia	39	36	51	42	33	39	44
Saudi Arabia	40	44	41	41	42	32	49
Bahrain	41	34	17	50	45	46	86
China	42	45	87	22	52	73	29
Oman	43	40	22	40	48	44	91
Poland	44	43	72	49	44	40	45
Azerbaijan	45	52	44	82	35	23	74
Philippines	46	68	55	34	69	61	32
Greece	47	69	81	60	30	52	36
Russia	48	65	86	43	57	51	31
Mauritius	49	41	46	70	49	41	80
Trinidad and Tobago	50	72	38	61	56	34	71
Uruguay	51	46	30	46	37	96	75
Hungary	52	47	63	83	50	48	41
Montenegro	53	56	50	58	61	38	55
Kazakhstan	54	62	58	78	39	62	39
Bulgaria	55	55	91	63	43	60	43
Argentina	56	82	57	38	51	67	64
Jamaica	57	51	32	59	92	57	69
Serbia	58	78	74	57	65	42	58
Croatia	59	76	104	62	59	54	50
Armenia	60	61	59	100	64	49	47
Jordan	61	48	65	86	47	75	66
Panama	62	57	25	85	58	83	82
Kuwait	63	74	35	95	53	74	78
Romania	64	66	95	74	54	71	56
Indonesia	65	54	78	48	81	55	84
Ukraine	66	94	93	68	73	56	46

(continued on next page)

Figure A3 (continued)

Heatmap: Rankings on GTCI overall and by pillar

COUNTRY	GTCI RANKING	ENABLE	ATTRACT	GROW	RETAIN	VT SKILLS	GK SKILLS
Countries BELOW the median in the overall GTCI score							
Thailand	67	50	60	72	76	86	61
Georgia	68	58	69	103	68	68	54
Mexico	69	70	90	45	79	81	62
South Africa	70	64	52	54	106	63	60
Botswana	71	53	47	51	93	98	72
India	72	63	92	44	95	76	57
Namibia	73	71	34	79	100	66	79
Colombia	74	81	102	53	75	69	77
Mongolia	75	84	83	84	63	87	51
Albania	76	83	62	73	78	65	104
Peru	77	87	75	76	89	72	73
Turkey	78	77	114	67	62	97	63
Tunisia	79	102	101	81	66	78	53
Brazil	80	79	96	55	70	101	81
Dominican Republic	81	67	53	96	86	93	92
Ecuador	82	96	107	52	67	80	93
Sri Lanka	83	85	112	92	77	47	96
Tajikistan	84	107	89	115	71	45	87
Gambia	85	75	23	88	99	85	131
Moldova	86	91	103	80	80	94	70
Ghana	87	60	61	71	103	84	99
Kenya	88	80	80	75	104	64	103
North Macedonia	89	86	117	107	60	79	76
Cabo Verde	90	73	56	99	88	77	120
Kyrgyzstan	91	113	94	110	72	59	89
Bhutan	92	49	85	91	83	99	126
Rwanda	93	59	66	77	91	112	107
Honduras	94	93	68	65	94	92	109
Guatemala	95	88	82	56	98	106	88
Viet Nam	96	90	105	89	87	117	59
Egypt	97	105	116	104	74	104	52
Lao PDR	98	95	97	111	107	100	48
Paraguay	99	101	64	94	90	109	102
Morocco	100	89	111	97	85	116	95
Bosnia and Herzegovina	101	106	121	87	96	70	98
Iran	102	114	131	101	82	89	65
Zambia	103	100	54	117	113	91	108
Senegal	104	92	70	90	109	107	119
Algeria	105	117	123	116	84	95	97
Pakistan	106	111	118	105	108	82	90
Bolivia	107	121	128	64	102	114	85
Côte d'Ivoire	108	104	79	93	118	108	105
Nicaragua	109	112	84	109	97	115	122
El Salvador	110	98	115	98	105	105	114
Tanzania	111	99	77	106	111	122	118
Nigeria	112	115	99	108	123	88	94
Uganda	113	103	76	114	122	113	111
Venezuela	114	130	129	66	101	111	83
Eswatini	115	109	88	123	110	121	123
Cameroon	116	119	113	102	124	103	100
Cambodia	117	97	100	124	116	125	112
Liberia	118	116	73	113	120	120	129
Lesotho	119	110	108	121	115	102	130
Malawi	120	118	110	125	112	129	101
Nepal	121	120	126	118	119	90	116
Burkina Faso	122	124	106	120	121	126	110
Ethiopia	123	125	122	119	114	128	106
Bangladesh	124	108	127	128	125	118	115
Mali	125	123	119	122	117	124	125
Madagascar	126	122	98	127	129	123	121
Zimbabwe	127	126	120	112	128	119	124
Mozambique	128	127	109	129	126	131	127
Burundi	129	129	125	126	127	127	132
Congo, Dem. Rep.	130	131	130	130	132	110	128
Angola	131	128	124	131	130	132	117
Yemen	132	132	132	132	131	130	113

Note: The darkest blue means the country belongs to the 4th quartile (best performers); medium colour = 3rd quartile; pale colour = 2nd quartile; palest colour = 1st quartile (worst performers). GK Skills = Global Knowledge Skills; VT Skills = Vocational and Technical Skills.

the top 15 performers in every pillar, 4 countries do so in five of the six pillars, and 5 countries do so in four of the six pillars. In terms of pillars, 13 of the top 15 countries are also in the top 15 in the Grow and Global Knowledge Skills pillars; 12 are in the top 15 in the Enable, Attract, and Retain pillars; and 11 are in the top 15 in the Vocational and Technical Skills pillar.

Several countries outside the top 15 are among the top performers in specific pillars. For instance, New Zealand has the fifth-highest score when it comes to attracting talent, while Austria (17th overall) is one of the global leaders in terms of retaining talent (5th) and in its pool of Vocational and Technical Skills (8th). Other countries that stand out in certain pillars are Japan (19th), which is a top performer in the Enable pillar (8th); and Israel (20th), which scores well in the Global Knowledge Skills pillar (6th). Both the United Arab Emirates (22nd) and Qatar (29th) are among the highest-scoring countries in terms of attracting talent (3rd and 4th, respectively).

The top 3 positions in this year's index are occupied by Switzerland, the United States, and Singapore. That the top spot is held by Switzerland is hardly surprising, since this has been the case ever since the first GTCI was launched in 2013. That the United States is placed 2nd is more noteworthy. For one thing, it is the country's highest ranking in the GTCI so far. For another, it means that it overtakes Singapore, which has been in the runner-up position in the index since its inception. To be sure, there is not much separating the United States and Singapore, but the improved ranking of the United States is consistent with its upward trend since the launch of the GTCI.

Switzerland (1st) remains the outright leader in the GTCI by virtue of its strong performances in almost every dimension. At the pillar level, its lowest rank is 6th (Attract), while it is ranked 1st in Retain; 2nd in Enable, Grow, and Vocational and Technical Skills; and 4th in Global Knowledge Skills. At the level of the sub-pillar, it is the global leader with respect to Lifelong Learning and Sustainability. In fact, Switzerland ranks outside the top 10 in only one of 14 sub-pillars: Internal Openness (16th), where it has relatively low rankings in variables related to gender equality and tolerance of minorities and immigrants. Another manifestation of Switzerland's strong talent competitiveness across the board is that it is placed in the top 10 in 42 variables, claiming the top spot in 14 of these.

The United States (2nd) makes it into the top 3 in four of the six pillars: Enable (3rd), Grow (1st), Vocational and Technical Skills (1st), and Global Knowledge Skills (2nd). The country's superiority in growing talent stems from outstanding performances in all three sub-pillars: Formal Education (2nd), Lifelong Learning (2nd), and Access to Growth Opportunities (1st). Its strong pool of Vocational and Technical Skills is primarily due to its ability to match the skills of people with the needs of the economy (1st in Employability), while its Global Knowledge Skills benefits from strong High-Level Skills (3rd). As for enabling talent, the sub-pillars related to Market Landscape (3rd) and Business and Labour Landscape (2nd) are particularly strong. The United States' lower ranking of 11th in Attract and 12th in Retain can be partly attributed to a relatively weak level of Internal Openness (14th) in the former case and a below-par Lifestyle (36th) in the latter.

Table A1

Countries with highest GTCI scores by pillar

PILLAR	TOP 3 COUNTRIES
Enable	Singapore, Switzerland, United States
Attract	Singapore, Luxembourg, United Arab Emirates
Grow	United States, Switzerland, Netherlands
Retain	Switzerland, Norway, Denmark
Vocational and Technical (VT) Skills	United States, Switzerland, Germany
Global Knowledge (GK) Skills	Singapore, United States, United Kingdom

Singapore (3rd) is the highest-ranked country in three pillars—Enable, Attract, and Global Knowledge Skills—and is therefore the country with most top spots at the pillar level. The country performs well in all the sub-pillars related to the three pillars, ranking 1st with respect to Regulatory Landscape, Business and Labour Landscape, External Openness, and High-Level Skills; 2nd when it comes to Talent Impact; 4th in Market Landscape; and 7th in Internal Openness. Singapore has also high scores in the pillars related to growing (8th) talent—boosted by strong opportunities for Lifelong Learning (3rd)—and to its pool of Vocational and Technical Skills (5th)—mainly benefiting from strong Employability (4th). However, the city-state's performance in the Retain (24th) pillar continues to be underwhelming, with scope for improvement in both sub-pillars (Sustainability, 24th, and Lifestyle, 28th).

Sweden (4th) is one of the most solid performers in the GTCI in that it scores well in almost every dimension. Tellingly, the country does not claim the top spot in a single indicator, but—in contrast to the top 3 countries—it ranks above the median in each indicator. At the pillar level, Sweden's lowest rank relates to attracting talent (10th), where relatively weak scores in attracting international business and people lead to a low degree of External Openness (21st) that is offset by a high degree of Internal Openness (3rd). Its highest rank is in the Enable pillar (4th), with strong performances in all three sub-pillars (Regulatory Landscape, 6th; Market Landscape, 5th; and Business and Labour Landscape, 8th).

Denmark (5th) performs particularly well in retaining talent (3rd), as a result of strong performances in both the Sustainability (5th) and Lifestyle (8th) sub-pillars. It has also an excellent pool of Global Knowledge Skills (6th), where a high degree of entrepreneurship and innovation makes it the global leader in terms of Talent Impact. Denmark also ranks 6th with respect to enabling talent, with performances in the top 10 in all associated sub-pillars. The only pillar where the country ranks outside the top 10 is that related to attracting talent (14th), which has particular room for improvement in luring talented people from abroad and in strengthening gender equality.

The Netherlands (6th) is most impressive when it comes to growing talent (3rd), where it posts high scores in all three sub-pillars: Formal Education (5th), Lifelong Learning (4th), and

Access to Growth Opportunities (2nd). The country is also a top performer in the pillars Enable (5th), Vocational and Technical Skills (6th), and Retain (7th), where some of its greatest assets include a conducive Business and Labour Landscape (5th), robust Sustainability (6th), and talent that matches the needs of the economy well (Employability, 5th). The Netherlands ranks outside the top 10 in two pillars: Attract (15th) and Global Knowledge Skills (16th). Scope for improvement include increasing Internal Openness (17th) in the former pillar and expanding High-Level Skills (21st) in the latter.

Finland (7th) is ranked 4th in both the Grow and Vocational and Technical Skills pillars. The country impresses in every dimension in the former category, with ranks in the top 10 in all sub-pillars (Formal Education, 3rd; Lifelong Learning, 6th; and Access to Growth Opportunities, 7th). In the latter category, Finland is one of the leading countries when it comes to matching the skills of people with the needs of the economy (3rd in Employability). It also does very well in retaining talent (8th), which can be mainly attributed to a high degree of Sustainability (7th). At the sub-pillar level, Finland's highest ranking relates to Internal Openness (2nd). However, a relatively low degree of External Openness (32nd)—with scope to attract more people from abroad—results in a rank of 13th in the Attract pillar.

Luxembourg (8th) stands out in two dimensions regarding talent competitiveness: attracting (2nd) and retaining (4th) talent. As for the former, the country has a high degree of External Openness (2nd) thanks to the country's strong ability to attract foreign business and talent. As for the latter, Luxembourg's world-class pension system and social protection contributes to its solid Sustainability (2nd). The country is a highly innovative and entrepreneurial country (it ranks 3rd in Talent Impact), but its pool of Global Knowledge Skills (11th) would increase with greater High-Level Skills (19th). Luxembourg's lowest rankings are in the Grow (19th) and Vocational and Technical Skills (16th) pillars, where areas for improvement include strengthening Formal Education (60th) and ensuring the Employability (25th) of domestic talent in the private sector.

Norway (9th) is one of the global leaders when it comes to retaining talent (2nd). The country's social welfare system gives it a rank of 4th in Sustainability, while its high level of personal health and safety results in a rank of 6th in Lifestyle. Norway also performs well in the sub-pillars related to Regulatory Landscape (4th) and High-Level Skills (6th), but the pillars with which they are associated—Enable (11th) and Global Knowledge Skills (13th)—are ranked lower because of its weaker Market Landscape (16th) and Business and Labour Landscape (14th) in the former case, and Talent Impact (18th) in the latter. The lowest-ranked pillar—Attract (16th)—is also the one with the largest contrasts: whereas Norway ranks 4th in terms of Internal Openness, it ranks 31st in External Openness, where there is potential to attract more business.

Australia (10th) claims the top spot in the sub-pillar Formal Education, primarily as a result of high scores in indicators related to tertiary education. However, the rank of its associated pillar, Grow (9th), is dampened by the performances in Lifelong Learning (14th) and Access to Growth Opportunities

(14th). Australia's best rank at the pillar level, meanwhile, concerns attracting talent (7th), where the high degrees of External Openness (8th) and Internal Openness (10th) are chiefly due to, respectively, its ability to attract talent from abroad and its strong social inclusion. Australia also makes it into the top 10 in the pillar Global Knowledge Skills (9th) thanks to solid performances in both sub-pillars (11th in High-Level Skills and 8th in Talent Impact). The country's lowest-ranked pillar remains Vocational and Technical Skills (20th), where more could be done to raise Mid-Level Skills (38th) and match labour market demand and workforce supply (17th in Employability).

Germany (11th) features in the top 10 countries in the three pillars: Vocational and Technical Skills (3rd), Enable (7th), and Retain (10th). The country's performance in both sub-pillars that relate to Vocational and Technical Skills—Mid-Level Skills (1st) and Employability (7th)—are excellent. As for Enable, it benefits from a favourable Business and Labour Landscape (4th) with a high level of technology adoption. When it comes to retaining talent, Germany combines a positive quality of life (7th in Lifestyle) with robust Sustainability (13th). The country's weakest points in terms of talent competitiveness concern Attract (19th) and Global Knowledge Skills (23rd), where there is room for improvement in areas related to gender equality and entrepreneurship, among others.

The United Kingdom (12th) is one of the top countries in growing talent (5th) and in having a strong pool of Global Knowledge Skills (3rd), ranking inside the top 10 in all the associated sub-pillars. As a talent magnet for overseas business and people, the country also performs well in the sub-pillar External Openness (6th), but a relatively low degree of Internal Openness (31st) drags down its overall rank in the Attract (12th) pillar. Solid performances in all sub-pillars related to Enable (15th) and Retain (17th) also contribute to the United Kingdom's overall ranking in the GTCI. The country's weakest pillar is Vocational and Technical Skills (24th), where more could be done to improve secondary education and make it more relevant for the labour market.

Canada (13th) makes it into the top in one pillar—Attract (8th)—particularly by virtue of widespread social inclusion that contributes to a high level of Internal Openness (5th). The country's best performance at the sub-pillar level is in High-Level Skills (4th), but a weaker Talent Impact (20th) results in a rank of 14th in the Global Knowledge Skills pillar. Canada's top 10 performances in the sub-pillars Lifelong Learning (10th) and Access to Growth Opportunities (9th) boost the country's rank in growing talent (11th). Canada's overall GTCI rank is dragged down by sub-par scores in Retain (20th) and Vocational and Technical Skills (19th), where improved Lifestyle (25th) indicators in the former case and greater Mid-Level Skills (42nd) in the latter would significantly raise the rankings of the respective pillars.

Iceland (14th) is the global leader when it comes to attracting domestic talent (Internal Openness). By contrast, it has a much lower ability to attract overseas business and people (54th in External Openness), which renders Attract (18th) the country's lowest-ranked pillar. Iceland's highest-ranked pillar is instead Retain (6th), with high scores in both Sustainability (8th) and Lifestyle (4th). It also makes it into the top 10 in the Global

Knowledge Skills (7th) pillar, where it primarily benefits from a strong pool of High-Level Skills (5th). Its pool of Mid-Level Skills (34th), however, is relatively weak, but is offset by an ability to match labour market demand and workforce supply (it ranks 11th in Employability). As a result, Iceland ranks 14th in terms of Vocational and Technical Skills.

Ireland (15th) returns to the top 15—at the expense of New Zealand—in the GTCI 2020. At the pillar level, it ranks in the top 10 with respect to Attract (9th), thanks to high scores in both External Openness (9th) and Internal Openness (13th). The country is particularly successful in attracting overseas business. It also has a good pool of Vocational and Technical Skills (11th), where a key strength is how well it matches labour supply with market demand (8th in Employability). Solid performances in both High-Level Skills (13th) and Talent Impact (11th) mean that the country also has a good pool of Global Knowledge Skills (12th). There is most scope for improvement in areas related to enabling talent (21st), where all three sub-pillars rank below Ireland's overall rank (Regulatory Landscape, 17th; Market Landscape, 30th; and Business and Labour Landscape, 20th).

ANALYSIS BY INCOME AND REGIONAL GROUPS

It has already been seen that all the top 15 countries in the GTCI 2020 are high-income countries. In fact, all high-income countries feature in the upper half of the rankings and, with one exception, the top quartile of 33 countries is comprised of only high-income countries. The exception is Malaysia (26th)—the top-ranked upper-middle-income country (Table A2). Within its income group, Malaysia is followed by Costa Rica (37th) and China (42nd), with an additional 12 upper-middle-income countries in the third quartile. Of the remaining upper-middle-income countries, 16 are ranked in the second quartile and 4 are placed in the bottom quartile. Only three lower-middle-income countries—the Philippines (46th), Indonesia (65th), and Ukraine—make it into the third quartile, with 13 countries in the second quartile and 16 countries in the first quartile. As for the 16 low-income countries, the top 3—Tajikistan (84th), Gambia (85th), and Rwanda (93rd)—are the only ones ranked above the bottom quartile.

In terms of regional distribution, the top quartile is dominated by European countries (21 of the top 33 countries to be precise). Europe is a heterogeneous region, however, and there are several economies further down the rankings, mainly in the third quartile (13 countries). Similarly, the Eastern, Southeastern Asia and Oceania region includes countries with highly varied performances in the GTCI 2020, although—like Europe—most of them are in the upper half of the rankings (10 out of 15 countries). The third regional group with considerable variation is Northern Africa and Western Asia, where four countries are in the fourth quartile, seven countries are in the third quartile, four countries in the second quartile, and three countries in the first quartile. Latin America and the Caribbean is not represented in the top quartile (although Chile—ranked 34th—is just outside it), with most countries in the third and second quartiles (16 out of 20). Central and Southern Asia has only one country in the upper half of the GTCI 2020 (Kazakhstan, 54th), while there are five countries

Table A2

Countries with highest GTCI scores by income and regional group

COMPARISON GROUP	TOP 3 COUNTRIES
By region	
Central and Southern Asia	Kazakhstan, India, Sri Lanka
Eastern, Southeastern Asia and Oceania	Singapore, Australia, New Zealand
Europe	Switzerland, Sweden, Denmark
Latin America and the Caribbean	Chile, Costa Rica, Trinidad and Tobago
Northern Africa and Western Asia	Israel, United Arab Emirates, Qatar
Northern America	United States, Canada
Sub-Saharan Africa	Mauritius, South Africa, Botswana
By income group	
High-income countries	Switzerland, United States, Singapore
Upper-middle-income countries	Malaysia, Costa Rica, China
Lower-middle-income countries	Philippines, Indonesia, Ukraine
Low-income countries	Tajikistan, Gambia, Rwanda

in the second quartile and four in the first quartile. The worst-performing region, Sub-Saharan Africa, is also the one with the highest proportion of countries in the bottom quartile (20 out of 29), with an additional eight countries in the second quartile and one country (Mauritius, 49th) in the third quartile.

Income Groups

The dominance of high-income countries in the overall ranking of the GTCI 2020 extends to the pillar level. A glance at Figure A4, which depicts the average score of each income group in each pillar, makes this all too clear. The gap in average scores between high-income countries and upper-middle-income countries ranges from about 18 (Vocational and Technical Skills, Attract, and Grow) to 24 (Retain). Thus, not only does the average high-income country outperform the averages of other income groups in all pillars, it does so by a significant margin.

It is also evident from Figure A4 that differences across countries from the other three income groups are not, generally speaking, as large as the gaps with respect to high-income countries. Nevertheless, their relative performances in the GTCI against one another are usually in the expected order in five of the six pillars—that is, upper-middle-income countries generally outperform lower-middle-income countries that, in turn, typically have higher scores than low-income countries.

The Attract pillar is the one pillar where there is not much separating the three income groups. Differences are not very large at when comparing scores for various types of summary statistics—for example, with respect to the mean or the 25th, 50th, and 75th percentiles. In fact, the group of low-income countries even outscores the group of lower-middle-income countries at certain percentiles.

It was mentioned earlier that there might be complementarities across the various dimensions of talent competitiveness. Analysis of the top performances in each income group lends

Figure A4

Average pillar scores, by income group



Note: The figure shows the average scores for each pillar of all countries within each group. GK Skills = Global Knowledge Skills; VT Skills = Vocational and Technical Skills.

further credence to this hypothesis. Indeed, eyeballing the best-performing (top 10) countries for each income group is enough to get a sense of how frequently the same countries recur in the various pillars (Tables A3a–A3d on pages 31–33). It can, for instance, be seen that, for each income group, the three top-performing countries in the overall GTCI are among the top-10 countries in at least four of the six pillars. This is to be expected insofar as the calculation of the GTCI is based on average pillar scores, but it also suggests the degree to which synergies occur across pillars.

Turning now our attention to specific income groups, 43 out of the 48 high-income countries are in the top 50 in the GTCI 2020. The best-performing high-income countries have already been analysed in detail above in the section discussing the top 15 countries. As for high-income countries at the other end of the scale, there are only five countries outside the top 50: **Uruguay** (51st), **Hungary** (52nd), **Croatia** (59th), **Panama** (62nd), and **Kuwait** (63rd). At the pillar level, they appear to be lagging behind when it comes to growing talent and in their pools of Vocational and Technical Skills, where four of these five countries are ranked below 50.

There are no new high-income countries in this year's index. The only difference compared with the GTCI 2019 is that **Argentina** (56th)—classified as a high-income country last year—has been assigned to the upper-middle-income group by the World Bank in its latest classification (July 2019).

Despite its improvement in the GTCI rankings over the previous year, Argentina is only in 10th position within the group of upper-middle-income countries. Instead, the best-performing country within the group is, as last year, **Malaysia** (26th). As already mentioned, Malaysia is the only non-high-income country to make it into the top quartile of the GTCI 2020. Not only that: It is a very consistent performer that finds itself in the top quartile in

all pillars apart from Retain (where it is just outside, at rank 34th). Unsurprisingly, Malaysia dominates other upper-middle-income countries, leading in four pillars (Enable, Attract, Retain, and Vocational and Technical Skills) and in the top 3 in the other two pillars. The country's most impressive showing relates to its ability to match labour market demand and workforce supply (6th in Employability), which contributes to its rank in 15th position in the Vocational and Technical Skills pillar, despite a weak pool of Mid-Level Skills (50th). Malaysia also performs well in two of the three sub-pillars that relate to enabling (26th) talent—Business and Labour Landscape (13th) and Market Landscape (22nd)—although more could be done to strengthen the Regulatory Landscape (45th). Other dimensions with a lot of scope for improvement include Lifestyle (53rd) and Internal Openness (52nd), where the latter would benefit from higher tolerance and greater opportunities for minorities and immigrants. The second-best performer among the upper-middle-income countries is **Costa Rica** (37th). Its strengths are clearly in the Input-related pillars, ranking in the top quartile in Attract (29th) and Grow (30th) and in the upper part of the third quartile in Enable (39th) and Retain (36th). The two Output-related pillars—Vocational and Technical Skills (50th) and Global Knowledge Skills (68th)—are primarily dragged down by weak skills at both the mid and high levels.

The third-highest-scoring upper-middle-income country is **China** (42nd), which makes it the best performer of the group of large emerging countries that make up **BRICS** (Brazil, Russia, India, China, and South Africa). China's performances in the various pillars of the GTCI is quite checkered. On the one hand, the country finds itself in the top quartile in two pillars—Grow (22nd) and Global Knowledge Skills (29th)—mainly as a result of its world-class educational system (8th in Formal Education) and its standing as a global power in innovation (15th in Talent Impact). On the other hand, it ranks in the second quartile when

Table A3a

Best performers by income group: High-income countries (48 countries)

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Switzerland (1)	Singapore (1)	Singapore (1)	United States (1)	Switzerland (1)	United States (1)	Singapore (1)
United States (2)	Switzerland (2)	Luxembourg (2)	Switzerland (2)	Norway (2)	Switzerland (2)	United States (2)
Singapore (3)	United States (3)	UAE (3)	Netherlands (3)	Denmark (3)	Germany (3)	United Kingdom (3)
Sweden (4)	Sweden (4)	Qatar (4)	Finland (4)	Luxembourg (4)	Finland (4)	Switzerland (4)
Denmark (5)	Netherlands (5)	New Zealand (5)	United Kingdom (5)	Austria (5)	Singapore (5)	Sweden (5)
Netherlands (6)	Denmark (6)	Switzerland (6)	Sweden (6)	Iceland (6)	Netherlands (6)	Denmark (6)
Finland (7)	Germany (7)	Australia (7)	Denmark (7)	Netherlands (7)	Sweden (7)	Iceland (7)
Luxembourg (8)	Japan (8)	Canada (8)	Singapore (8)	Finland (8)	Norway (8)	Israel (8)
Norway (9)	Luxembourg (9)	Ireland (9)	Australia (9)	Sweden (9)	Austria (9)	Australia (9)
Australia (10)	Finland (10)	Sweden (10)	Belgium (10)	Germany (10)	Denmark (10)	Estonia (10)

Note: Numbers in parentheses are global ranks in the associated dimension.

it comes to attracting (87th) talent and Vocational and Technical Skills (73rd), where higher levels of both External Openness (83rd) and Internal Openness (89th) would improve the former pillar and greater Mid-Level Skills would do much to strengthen the latter pillar.

The second-highest ranked BRICS member is **Russia** (48th), whose strong pool of High-Level Skills (12th) contributes to a position in the top quartile when it comes to Global Knowledge Skills (31st). The country also performs well in terms of growing (43rd) talent, where it is primarily boosted by a solid system of Formal Education (27th). A weak Regulatory Landscape (103rd) impedes Russia's ability to enable (65th) talent. However, the country's greatest challenge is, as in previous years, its ability to attract (86th) talent. Higher External Openness (87th) towards foreign investment and ownership and greater Internal Openness (85th) towards minorities and immigrants would go a long way to change that.

Russia is followed by **South Africa** (70th). The country is a consistent performer with positions in the lower part of the third quartile in five of the six pillars. Of particular note are South Africa's performances in Access to Growth Opportunities (35th) and Talent Impact (47th), which boost the pillars Grow (54th) and Global Knowledge Skills (60th), respectively. However, its highest-ranked pillar is Attract (52nd) due to relatively high levels of External Openness (53rd) and Internal Openness (57th). The one dimension that drags down South Africa's overall ranking in the GTCI 2020 is its weak ability to retain (106th) talent, which stems from poor Sustainability (108th) and Lifestyle (102nd).

Not far behind South Africa is **India** (72nd). Although more could be done to improve the country's educational system (68th in Formal Education), India's key strength relates to growing (44th) talent, primarily by virtue of the possibilities for Lifelong Learning (40th) and Access to Growth Opportunities (39th). Its highest-ranked sub-pillar, however, is Employability (28th), but the ability to match labour market demand and supply stands in

contrast to the country's poor Mid-Level Skills (113th), which result in a mediocre score in Vocational and Technical Skills (76th). India's greatest challenge is to address its weak ability to attract (92nd) and retain (95th) talent. With regard to the former pillar, there is a need to strengthen the role of minorities and women in order to raise the level of Internal Openness (104th). As for the latter pillar, India's low scores in the indicators that relate to quality of life (Lifestyle, 115th) fall well short of its more positive showing in Sustainability (53rd).

The lowest-ranked BRICS country in the GTCI 2020 is **Brazil** (80th), whose lacklustre performance in the index is primarily due to its low ability to attract (96th) talent and its weak pool of Vocational and Technical Skills (101st). Greater External Openness (115th) would go a long way to lift the country's Attract score (96th), while improvements in matching job skills to the needs of the economy (123rd in Employability) would raise its Vocational and Technical Skills. Brazil's best performances relate to growing (55th) talent, where it benefits from a solid educational system (56th in Formal Education) and positive Access to Growth Opportunities (41st). The country also has a conducive Market Landscape (47th), but its sub-optimal Regulatory Landscape (85th) and Business and Labour Landscape (91st) result in a mediocre ability to enable (79th) talent.

The three highest-scoring countries of the lower-middle-income group—the **Philippines** (46th), **Indonesia** (65th), and **Ukraine** (66th)—are the only ones of that group positioned in the third quartile. The Philippines is even in the top quartile when it comes to Global Knowledge Skills (32nd), where it scores well in both High-Level Skills (37th) and Talent Impact (29th). The country is also just outside the top quartile when it comes to growing (34th) talent, where its strengths in Lifelong Learning (17th) and Access to Growth Opportunities (24th) offset a weaker Formal Education (88th). The greatest challenges facing the Philippines in terms of talent competitiveness relate to enabling (68th) and retaining (69th) talent, where the priorities

Table A3b

Best performers by income group: Upper-middle-income countries (36 countries)

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Malaysia (26)	Malaysia (26)	Malaysia (28)	China (22)	Malaysia (34)	Malaysia (15)	China (29)
Costa Rica (37)	Costa Rica (39)	Costa Rica (29)	Malaysia (23)	Azerbaijan (35)	Azerbaijan (23)	Russia (31)
China (42)	Mauritius (41)	Jamaica (32)	Costa Rica (30)	Costa Rica (36)	Montenegro (38)	Malaysia (33)
Azerbaijan (45)	China (45)	Namibia (34)	Argentina (38)	Kazakhstan (39)	Mauritius (41)	Kazakhstan (39)
Russia (48)	Jordan (48)	Azerbaijan (44)	Russia (43)	Bulgaria (43)	Serbia (42)	Bulgaria (43)
Mauritius (49)	Thailand (50)	Mauritius (46)	Mexico (45)	Jordan (47)	Sri Lanka (47)	Armenia (47)
Montenegro (53)	Jamaica (51)	Botswana (47)	Botswana (51)	Mauritius (49)	Armenia (49)	Georgia (54)
Kazakhstan (54)	Azerbaijan (52)	Montenegro (50)	Ecuador (52)	Argentina (51)	Costa Rica (50)	Montenegro (55)
Bulgaria (55)	Botswana (53)	South Africa (52)	Colombia (53)	China (52)	Russia (51)	Romania (56)
Argentina (56)	Bulgaria (55)	Dominican Rep. (53)	South Africa (54)	Romania (54)	Jamaica (57)	Serbia (58)

Note: Numbers in parentheses are global ranks in the associated dimension.

should be on strengthening the Regulatory (91st) and Market (86th) Landscapes in the context of the former pillar and improving the Lifestyle (81st) indicators that relate to the latter pillar. Indonesia, on the other hand, does not rank in the top quartile with respect to any of its pillars. However, at the sub-pillar level, it does so when it comes to Access to Growth Opportunities (26th) and Employability (30th), which boost the scores of, respectively, the pillars Grow (48th) and Vocational and Technical Skills (55th). By contrast, the sub-pillars High-Level Skills (82nd) and Talent Impact (91st)—which make up the pillar Global Knowledge Skills (84th)—are among the dimensions where Indonesia lags behind a majority of countries. Ukraine performs particularly well in the two Output-related pillars: Vocational and Technical Skills (56th) and Global Knowledge Skills (46th). Above all, it has a strong

pool of High-Level Skills (26th), which boost the latter pillar. More discouraging is the country's performance in the dimensions that relate to enabling (94th) and attracting (93rd) talent, where its greatest challenges include improving the Regulatory Landscape (115th), encouraging greater foreign investment and ownership for a higher External Openness (98th), and stimulating more social inclusion to increase Internal Openness (84th).

Only three low-income countries make it into the second quartile of the GTCI 2020: **Tajikistan** (84th), **Gambia** (85th), and **Rwanda** (93rd). Tajikistan finds itself in the upper half of the rankings with respect to Vocational and Technical Skills (45th), as a result of solid performances in both Mid-Level Skills (49th) and Employability (58th). However, it is in the bottom quartile when it comes to enabling (107th) and growing (115th) talent, where the

Table A3c

Best performers by income group: Lower-middle-income countries (32 countries)

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Philippines (46)	Bhutan (49)	Zambia (54)	Philippines (34)	Mongolia (63)	Indonesia (55)	Philippines (32)
Indonesia (65)	Indonesia (54)	Philippines (55)	India (44)	Tunisia (66)	Ukraine (56)	Ukraine (46)
Ukraine (66)	Ghana (60)	Cabo Verde (56)	Indonesia (48)	Philippines (69)	Kyrgyzstan (59)	Lao PDR (48)
India (72)	India (63)	Ghana (61)	Bolivia (64)	Kyrgyzstan (72)	Philippines (61)	Mongolia (51)
Mongolia (75)	Philippines (68)	Honduras (68)	Honduras (65)	Ukraine (73)	Kenya (64)	Egypt (52)
Tunisia (79)	Cabo Verde (73)	Senegal (70)	Ukraine (68)	Egypt (74)	India (76)	Tunisia (53)
Moldova (86)	Kenya (80)	Indonesia (78)	Ghana (71)	Moldova (80)	Cabo Verde (77)	India (57)
Ghana (87)	Mongolia (84)	Côte d'Ivoire (79)	Kenya (75)	Indonesia (81)	Tunisia (78)	Viet Nam (59)
Kenya (88)	Morocco (89)	Kenya (80)	Moldova (80)	Bhutan (83)	Pakistan (82)	Moldova (70)
Cabo Verde (90)	Viet Nam (90)	Mongolia (83)	Tunisia (81)	Morocco (85)	Ghana (84)	Indonesia (84)

Note: Numbers in parentheses are global ranks in the associated dimension.

Table A3d

Best performers by income group: Low-income countries (16 countries)

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Tajikistan (84)	Rwanda (59)	Gambia (23)	Rwanda (77)	Tajikistan (71)	Tajikistan (45)	Tajikistan (87)
Gambia (85)	Gambia (75)	Rwanda (66)	Gambia (88)	Rwanda (91)	Gambia (85)	Malawi (101)
Rwanda (93)	Tanzania (99)	Liberia (73)	Tanzania (106)	Gambia (99)	Nepal (90)	Ethiopia (106)
Tanzania (111)	Uganda (103)	Uganda (76)	Liberia (113)	Tanzania (111)	DR Congo (110)	Rwanda (107)
Uganda (113)	Tajikistan (107)	Tanzania (77)	Uganda (114)	Malawi (112)	Rwanda (112)	Burkina Faso (110)
Liberia (118)	Liberia (116)	Tajikistan (89)	Tajikistan (115)	Ethiopia (114)	Uganda (113)	Uganda (111)
Malawi (120)	Malawi (118)	Madagascar (98)	Nepal (118)	Mali (117)	Liberia (120)	Yemen (113)
Nepal (121)	Nepal (120)	Burkina Faso (106)	Ethiopia (119)	Nepal (119)	Tanzania (122)	Nepal (116)
Burkina Faso (122)	Madagascar (122)	Mozambique (109)	Burkina Faso (120)	Liberia (120)	Madagascar (123)	Tanzania (118)
Ethiopia (123)	Mali (123)	Malawi (110)	Mali (122)	Burkina Faso (121)	Mali (124)	Madagascar (121)

Note: Numbers in parentheses are global ranks in the associated dimension.

country's weakest dimensions are Regulatory (126th) and Market (118th) Landscapes in the former case and Formal Education (117th) and Access to Growth Opportunities (121st) in the latter. Gambia's greatest asset in terms of talent competitiveness is, by far, its ability to attract (23rd) talent, where it benefits from an impressive level of External Openness (14th). Its pool of Global Knowledge Skills (131st) stands in stark contrast to this, as very weak High-Level Skills (125th) and Talent Impact (129th) make it the second-lowest ranked country in this dimension.² Rwanda's greatest strengths are in the Input-related pillars. Its highest rank relates to enabling (59th) talent, which is primarily boosted by solid performances in Regulatory Landscape (51st) and Business and Labour Landscape (49th). The country also performs well in the Attract (66th) pillar, which can be mainly attributed to its level of External Openness (58th). However, Rwanda finds itself in the bottom quartile with respect to both Output-related pillars—Vocational and Technical Skills (112th) and Global Knowledge Skills (107th)—where it faces a particular challenge in raising the Mid- and High-Level Skills (122nd and 115th, respectively).

Regional Groups

Two conclusions that can be drawn from the results in the GTCI 2020 (as in previous years) are, as already discussed, (1) the strong positive correlation between GTCI score and income level and (2) the complementarities across the six pillars. The combination of these two findings would lead one to expect that regional groups with a greater share of higher-income countries perform better in the GTCI and that this is the case in all pillars.

The discussion concerning Figure A1 already made the previous point: performance in the overall GTCI at the regional level reflects the proportion of various income groups. Figure A5 shows that this association also holds at the pillar level. This is most obvious in the case of Northern America, which occupies the top position across the board. Granted, Northern America is an extreme case in that it only consists of two high-income

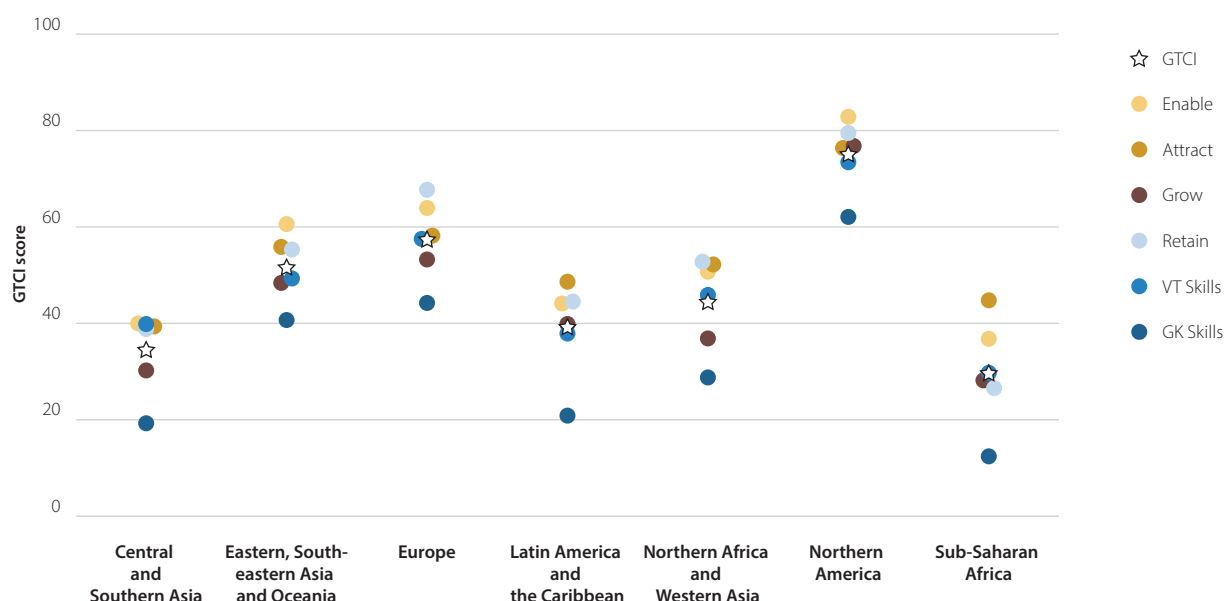
countries (the United States and Canada), but Europe (with 38 countries) and Eastern, Southeastern Asia and Oceania (with 15 countries) are similarly ranked 2nd and 3rd, respectively, in each of the six pillars.

The rankings of the remaining regions across the various pillars are also in most cases the same as the overall GTCI, but there are a few exceptions. Northern Africa and Western Asia is ranked 4th in all pillars apart from Grow, where it is behind Latin America and the Caribbean because of the latter's superior performance in Formal Education and Lifelong Learning. Latin America and the Caribbean is frequently ranked 5th among the various regions, but—in addition to Grow—it has a different rank when it comes to Vocational and Technical Skills. In this instance, Central and Southern Asia—which is most often ranked 6th—outperforms Latin America and the Caribbean as a result of a generally better Employability. Finally, Sub-Saharan Africa is bottom ranked in all pillars except for Attract, where it benefits from higher External Openness and Internal Openness than Central and Southern Asia.

Table A4 lists the top 10 performers by regional group. The remainder of this section looks at them each in turn, with a focus on the top-ranked countries.

Central and Southern Asia (10 countries): Five countries in this region are classified as belonging to the lower-middle-income group, whereas three are upper-middle-income and two are low-income countries. The top performer of the group, **Kazakhstan** (54th), is the only country from the region that is ranked in the third quartile. Indeed, it is ranked in that quartile in five of the six pillars, with retaining talent and Global Knowledge Skills being the two dimensions where it performs best (ranked 39th in both). The exception is the Grow (78th) pillar, where a lack of personal rights and a low use of virtual networks hamper Access to Growth Opportunities (98th). The second-highest ranked country in the region is also the largest: India (72nd). As discussed in the previous section, its strongest performance

Figure A5

Average pillar scores, by regional group

Note: The figure shows the average scores for each pillar of all countries within each group. GK Skills = Global Knowledge Skills; VT Skills = Vocational and Technical Skills.

relates to the Grow (44th) pillar, while much remains to be done to improve its ability to Attract (92nd) and Retain (95th) talent. **Sri Lanka** (83rd) has the third-highest score in the region—just ahead of Tajikistan (84th), discussed above—which is primarily boosted by the country's pool of Vocational and Technical Skills (47th). This, in turn, is chiefly the result of its ability to match labour market demand and workforce supply (43rd in Employability). More discouraging is Sri Lanka's weakness in attracting (112th) talent, which is in no small part due to a very low level of External Openness (127th).

Eastern, Southeastern Asia and Oceania (15 countries):

This region is one of the most heterogeneous in the GTCI 2020—ranging from Singapore ranked 3rd to **Cambodia** ranked 117th. It includes six high-income countries, three upper-middle-income countries, and six lower-middle-income countries. Singapore has already been discussed above in the section on the top 15 countries in this year's index, as has the second best-performing country in the region: Australia (10th). **New Zealand** (16th)—a top 15 country last year—is a global leader with respect to attracting (5th) talent, with strong performances in both External Openness (7th) and Internal Openness (8th). The country also has a conducive environment for enabling (12th) talent, with the second-best Regulatory Landscape being particularly impressive. The pillar that is holding back New Zealand's overall rank the most is Vocational and Technical Skills (26th), where a relatively weak pool of Mid-Level Skills (36th) suggests the need for additional efforts to raise secondary education and improve vocational and technical training. Not far behind is **Japan** (19th), which is one of the leading countries in enabling (8th) talent,

where its second-placed performance in Market Landscape is particularly noteworthy. The only pillar where the country finds itself outside the top quartile is Attract (40th), where External Openness (38th) would mainly benefit from a greater ability to attract foreign people and Internal Openness (46th) would gain a lot from improvements in gender equality. Attracting talent is also the biggest challenge facing the **Republic of Korea (South Korea, 27th)**, which is positioned just behind Malaysia (26th, discussed in the previous section) in the GTCI 2020. Its global rank of 71st in that pillar is a result of low levels in both External Openness (70th) and Internal Openness (78th). As for the other pillars, South Korea—just like Japan—is ranked in the top quartile in all of them. Most impressive are its performances relating to Enable and Global Knowledge (ranked 20th in both), especially when it comes to Market Landscape, where it is the highest-ranked country in the world.

Europe (38 countries): This is another of the most heterogeneous regions in the GTCI, with 28 high-income countries, 8 upper-middle-income countries, and 2 lower-middle-income countries. Hence, the varied performances seen in Europe—from the top position of Switzerland to the 101st rank of the **Bosnia and Herzegovina**. All the top 11 performing European countries have been discussed earlier in the section on the top 15 countries in the GTCI 2020. Next in the list of highest-ranked European countries are **Austria** (17th) and **Belgium** (18th). Austria is in the top 10 when it comes to Retain (5th) and Vocational and Technical Skills (9th), where the former is boosted by a strong Formal Education (10th) and the latter benefits from outstanding Mid-Level Skills (6th). This stands in contrast

Table A4

Ten best performers by regional group

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Central and Southern Asia (10 countries)						
Kazakhstan (54)	Bhutan (49)	Kazakhstan (58)	India (44)	Kazakhstan (39)	Tajikistan (45)	Kazakhstan (39)
India (72)	Kazakhstan (62)	Bhutan (85)	Kazakhstan (78)	Tajikistan (71)	Sri Lanka (47)	India (57)
Sri Lanka (83)	India (63)	Tajikistan (89)	Bhutan (91)	Kyrgyzstan (72)	Kyrgyzstan (59)	Iran (65)
Tajikistan (84)	Sri Lanka (85)	India (92)	Sri Lanka (92)	Sri Lanka (77)	Kazakhstan (62)	Tajikistan (87)
Kyrgyzstan (91)	Tajikistan (107)	Kyrgyzstan (94)	Iran (101)	Iran (82)	India (76)	Kyrgyzstan (89)
Bhutan (92)	Bangladesh (108)	Sri Lanka (112)	Pakistan (105)	Bhutan (83)	Pakistan (82)	Pakistan (90)
Iran (102)	Pakistan (111)	Pakistan (118)	Kyrgyzstan (110)	India (95)	Iran (89)	Sri Lanka (96)
Pakistan (106)	Kyrgyzstan (113)	Nepal (126)	Tajikistan (115)	Pakistan (108)	Nepal (90)	Bangladesh (115)
Nepal (121)	Iran (114)	Bangladesh (127)	Nepal (118)	Nepal (119)	Bhutan (99)	Nepal (116)
Bangladesh (124)	Nepal (120)	Iran (131)	Bangladesh (128)	Bangladesh (125)	Bangladesh (118)	Bhutan (126)
Eastern, Southeastern Asia and Oceania (15 countries)						
Singapore (3)	Singapore (1)	Singapore (1)	Singapore (8)	Australia (11)	Singapore (5)	Singapore (1)
Australia (10)	Japan (8)	New Zealand (5)	Australia (9)	Japan (16)	Japan (13)	Australia (9)
New Zealand (16)	New Zealand (12)	Australia (7)	New Zealand (15)	New Zealand (18)	Malaysia (15)	New Zealand (17)
Japan (19)	Australia (17)	Malaysia (28)	Japan (20)	Singapore (24)	Australia (20)	South Korea (20)
Malaysia (26)	South Korea (20)	Brunei Darussalam (37)	China (22)	South Korea (26)	Brunei Darussalam (25)	Japan (24)
South Korea (27)	Malaysia (26)	Japan (40)	Malaysia (23)	Malaysia (34)	New Zealand (26)	China (29)
Brunei Darussalam (38)	Brunei Darussalam (33)	Philippines (55)	South Korea (25)	China (52)	South Korea (30)	Philippines (32)
China (42)	China (45)	Thailand (60)	Philippines (34)	Brunei Darussalam (55)	Indonesia (55)	Malaysia (33)
Philippines (46)	Thailand (50)	South Korea (71)	Indonesia (48)	Mongolia (63)	Philippines (61)	Brunei Darussalam (37)
Indonesia (65)	Indonesia (54)	Indonesia (78)	Brunei Darussalam (69)	Philippines (69)	China (73)	Lao PDR (48)
Europe (38 countries)						
Switzerland (1)	Switzerland (2)	Luxembourg (2)	Switzerland (2)	Switzerland (1)	Switzerland (2)	United Kingdom (3)
Sweden (4)	Sweden (4)	Switzerland (6)	Netherlands (3)	Norway (2)	Germany (3)	Switzerland (4)
Denmark (5)	Netherlands (5)	Ireland (9)	Finland (4)	Denmark (3)	Finland (4)	Sweden (5)
Netherlands (6)	Denmark (6)	Sweden (10)	United Kingdom (5)	Luxembourg (4)	Netherlands (6)	Denmark (6)
Finland (7)	Germany (7)	United Kingdom (12)	Sweden (6)	Austria (5)	Sweden (7)	Iceland (7)
Luxembourg (8)	Luxembourg (9)	Finland (13)	Denmark (7)	Iceland (6)	Norway (8)	Estonia (10)
Norway (9)	Finland (10)	Denmark (14)	Belgium (10)	Netherlands (7)	Austria (9)	Luxembourg (11)
Germany (11)	Norway (11)	Netherlands (15)	Norway (12)	Finland (8)	Denmark (10)	Ireland (12)
United Kingdom (12)	Austria (13)	Norway (16)	Germany (13)	Sweden (9)	Ireland (11)	Norway (13)
Iceland (14)	United Kingdom (15)	Iceland (18)	Ireland (14)	Germany (10)	Iceland (14)	Finland (15)

(continued on next page)

Table A4 (continued)

Ten best performers by regional group

GTCI	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
Latin America and the Caribbean (20 countries)						
Chile (34)	Chile (38)	Panama (25)	Chile (26)	Costa Rica (36)	Trinidad and Tobago (34)	Chile (40)
Costa Rica (37)	Costa Rica (39)	Costa Rica (29)	Costa Rica (30)	Uruguay (37)	Chile (36)	Mexico (62)
Trinidad and Tobago (50)	Uruguay (46)	Uruguay (30)	Argentina (38)	Chile (40)	Costa Rica (50)	Argentina (64)
Uruguay (51)	Jamaica (51)	Jamaica (32)	Mexico (45)	Argentina (51)	Jamaica (57)	Costa Rica (68)
Argentina (56)	Panama (57)	Trinidad and Tobago (38)	Uruguay (46)	Trinidad and Tobago (56)	Argentina (67)	Jamaica (69)
Jamaica (57)	Dominican Rep. (67)	Chile (39)	Ecuador (52)	Panama (58)	Colombia (69)	Trinidad and Tobago (71)
Panama (62)	Mexico (70)	Dominican Rep. (53)	Colombia (53)	Ecuador (67)	Peru (72)	Peru (73)
Mexico (69)	Trinidad and Tobago (72)	Argentina (57)	Brazil (55)	Brazil (70)	Ecuador (80)	Uruguay (75)
Colombia (74)	Brazil (79)	Paraguay (64)	Guatemala (56)	Colombia (75)	Mexico (81)	Colombia (77)
Peru (77)	Colombia (81)	Honduras (68)	Jamaica (59)	Mexico (79)	Panama (83)	Brazil (81)
Northern Africa and Western Asia (18 countries)						
Israel (20)	Israel (19)	UAE (3)	Israel (21)	Israel (21)	Israel (12)	Israel (8)
UAE (22)	UAE (22)	Qatar (4)	UAE (24)	UAE (29)	Qatar (22)	Cyprus (19)
Qatar (29)	Qatar (28)	Bahrain (17)	Qatar (36)	Cyprus (32)	Azerbaijan (23)	UAE (38)
Cyprus (30)	Bahrain (34)	Oman (22)	Oman (40)	Azerbaijan (35)	Cyprus (28)	Armenia (47)
Saudi Arabia (40)	Cyprus (37)	Cyprus (27)	Saudi Arabia (41)	Qatar (41)	UAE (31)	Saudi Arabia (49)
Bahrain (41)	Oman (40)	Kuwait (35)	Cyprus (47)	Saudi Arabia (42)	Saudi Arabia (32)	Egypt (52)
Oman (43)	Saudi Arabia (44)	Saudi Arabia (41)	Bahrain (50)	Bahrain (45)	Oman (44)	Tunisia (53)
Azerbaijan (45)	Jordan (48)	Azerbaijan (44)	Turkey (67)	Jordan (47)	Bahrain (46)	Georgia (54)
Armenia (60)	Azerbaijan (52)	Israel (48)	Tunisia (81)	Oman (48)	Armenia (49)	Turkey (63)
Jordan (61)	Georgia (58)	Armenia (59)	Azerbaijan (82)	Kuwait (53)	Georgia (68)	Jordan (66)
Northern America (2 countries)						
United States (2)	United States (3)	Canada (8)	United States (1)	United States (12)	United States (1)	United States (2)
Canada (13)	Canada (14)	United States (11)	Canada (11)	Canada (20)	Canada (19)	Canada (14)
Sub-Saharan Africa (29 countries)						
Mauritius (49)	Mauritius (41)	Gambia (23)	Botswana (51)	Mauritius (49)	Mauritius (41)	South Africa (60)
South Africa (70)	Botswana (53)	Namibia (34)	South Africa (54)	Cabo Verde (88)	South Africa (63)	Botswana (72)
Botswana (71)	Rwanda (59)	Mauritius (46)	Mauritius (70)	Rwanda (91)	Kenya (64)	Namibia (79)
Namibia (73)	Ghana (60)	Botswana (47)	Ghana (71)	Botswana (93)	Namibia (66)	Mauritius (80)
Gambia (85)	South Africa (64)	South Africa (52)	Kenya (75)	Gambia (99)	Cabo Verde (77)	Nigeria (94)
Ghana (87)	Namibia (71)	Zambia (54)	Rwanda (77)	Namibia (100)	Ghana (84)	Ghana (99)
Kenya (88)	Cabo Verde (73)	Cabo Verde (56)	Namibia (79)	Ghana (103)	Gambia (85)	Cameroon (100)
Cabo Verde (90)	Gambia (75)	Ghana (61)	Gambia (88)	Kenya (104)	Nigeria (88)	Malawi (101)
Rwanda (93)	Kenya (80)	Rwanda (66)	Senegal (90)	South Africa (106)	Zambia (91)	Kenya (103)
Zambia (103)	Senegal (92)	Senegal (70)	Côte d'Ivoire (93)	Senegal (109)	Botswana (98)	Côte d'Ivoire (105)

Note: Numbers in parentheses are global ranks in the associated dimension.

to the country's weaker pool of High-Level Skills (30th), which impedes its Global Knowledge Skills (25th). Belgium, meanwhile, is particularly strong in growing (10th) talent, with solid performances in all three sub-pillars. The dimension with most scope for improvement is Attract (21st), especially as it relates to Internal Openness (25th). The rankings of two of Europe's largest economies—**France** (21st) and **Italy** (36th)—are also mainly impeded by lacklustre performances in the Attract pillar (36th and 67th, respectively). In the case of France, the low level of Internal Openness (58th) presents the biggest challenge. In the case of Italy, both sub-pillars need to improve considerably (External Openness, 72nd; Internal Openness, 65th). On a more positive note, France finds itself in 17th position with respect to both Grow and Vocational and Technical Skills, while Italy's showing in Lifestyle (18th) benefits the country's ability to retain (28th) talent.

Latin America and the Caribbean (20 countries): This region consists primarily of upper-middle-income countries: 12 in total. The eight remaining countries are equally divided in the low- and high-income groups. None of the countries in the region makes it into the top quartile at the global level, although **Chile** (34th) is as close as it gets. Chile stands out as one of the more consistent performers in the GTCI 2020, with rankings in all six pillars that are near its overall position. That said, the country only finds itself in the top quartile in one dimension, Grow (26th), as a result of solid performances in all associated sub-pillars. Although no particular pillar is much weaker than the others, the weaker performances in the sub-pillars High-Level Skills (64th), Lifestyle (59th), and Business and Labour Landscape (59th) suggest the main areas in need of improvement. **Costa Rica** (37th) is the next-highest performer in the region. Its strengths are primarily in the Input-related dimensions, where the ability to attract (29th) and grow (30th) talent place the country in the top quartile in those pillars. Of particular note is its relatively high level of Internal Openness (22nd). As for the Output-related pillars, Global and Knowledge Skills (68th) is the only one where Costa Rica finds itself below the median, with sub-par performances in both sub-pillars. When it comes to Vocational and Technical Skills (50th), a strong showing in Employability (23rd) is cancelled out by weak Mid-Level Skills (88th). Both economic powerhouses of the region, **Brazil** (80th) and **Mexico** (69th), are below the median in terms of GTCI score. Mexico, like Brazil (already discussed above in the context of BRICS), performs relatively well in the Grow (45th) pillar, which is built on fairly solid performances in all three sub-pillars. Its greatest challenge relates to Internal Openness (102nd), which decreases the country's ability to attract (90th) talent.

Northern Africa and Western Asia (18 countries): This is the only region that includes countries from all income groups: eight high-income economies, six upper-middle-income economies, three lower-middle-income economies, and one low-income economy. The top three regional countries—**Israel** (20th), the **United Arab Emirates** (UAE, 22nd), and **Qatar** (29th)—are all part of the top quartile in the global rankings. Israel is a top-10 country when it comes Global Knowledge

Skills (8th), where its second-best showing in High-Level Skills is particularly impressive. The country also puts in a strong performance in the other Output-related pillar—Vocational and Technical Skills (12th)—where it is adept at matching labour market demands and job skills (9th in Employability). The one pillar where Israel is ranked outside the top quartile is Attract (48th), where a very low level of Internal Openness (105th) would primarily improve through greater tolerance of minorities and immigrants. In contrast to Israel, both the UAE and Qatar are among the global leaders when it comes to attracting talent (3rd and 4th, respectively), as a result of impressive levels of both External Openness (3rd and 5th) and Internal Openness (9th and 6th). Whereas Attract is the greatest strength of both countries, they also share the same main weakness: Global Knowledge Skills (UAE, 38th; Qatar, 67th). In the case of the UAE, there is clear scope for improvement in innovation and entrepreneurship (61st in Talent Impact). In the case of Qatar, there is a need to strengthen both sub-pillars (High-Level Skills, 63rd; Talent Impact, 65th). As the table on the regional top 10 shows, Western Asian countries outshine Northern African countries in the GTCI 2020. Indeed, it is the Northern African countries that, together with **Yemen** (132nd), bring up the rear of the regional rankings. Yemen is the lowest-ranked country in all pillars within the region, but some encouragement can be had from how the country's High-Level Skills (100th) boosts its pool of Global Knowledge Skills (113th).

Northern America (2 countries): Both Northern American economies—the United States (2nd) and Canada (13th)—feature in the top 15 high performers of this year's GTCI. As can be seen in the table, the United States tops its neighbouring country in every pillar apart from Attract. It is also the more consistent performer of the two, ranking inside the top 15 in all pillars. As their performances are extensively discussed in the section on the top 15 of the GTCI 2020, the reader is referred to that section for further analysis.

Sub-Saharan Africa (29 countries): It has already been seen that this region has the weakest average performance in the GTCI 2020. In fact, no fewer than 20 of the Sub-Saharan African countries are found at the bottom quartile of the index. This is not a surprising result given that 13 of the countries in the region belong to the low-income group, while the rest of Sub-Saharan Africa is represented by 12 lower-middle-income countries and 4 upper-middle-income ones. **Mauritius** (49th) is the only country in the region that has an overall score above the GTCI median. At the pillar level, this can primarily be attributed to solid performances in enabling talent and Vocational and Technical Skills (41st in both), where the former pillar benefits from a strong Regulatory Landscape (35th) and the latter is lifted by the country's Mid-Level Skills (44th). At the other end of the spectrum, the country's main challenge is to improve its pool of Global Knowledge Skills (80th), particularly as they relate to High-Level Skills (86th). South Africa (70th) is the second-best-performing country in the region. As discussed in the previous section, the country performs relatively well in five of the six pillars but faces a significant challenge in strengthening its ability to retain (106th) talent. Just behind South Africa is **Botswana** (71st).

Its main strengths relate to enabling (53rd), attracting (47th), and growing (51st) talent, with the best showings being in the sub-pillars Formal Education (37th), Regulatory Landscape (40th), and Internal Openness (47th). Botswana's greatest scope for improvement can be found in the Retain (93rd) and Vocational and Technical Skills (98th) pillars, with weak performances in all the associated sub-pillars.

ENDNOTES

- 1 Countries are grouped according to the World Bank Income Classifications. Economies are divided based on their 2018 gross national income (GNI) per capita, calculated using the World Bank Atlas method (see <https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2019-2020>). The groups are: low income; lower-middle income; upper-middle income; and high income. Regional groups are based on United Nations Regional Classifications: Central and Southern Asia; Eastern, Southeastern Asia and Oceania; Europe; Latin America and the Caribbean; Northern Africa and Western Asia; Northern America; and Sub-Saharan Africa.
- 2 However, as pointed out in the GTCI 2020 JRC Statistical Audit (Chapter 6), the results that relate to Gambia should be treated with caution in view of the wide range of the associated confidence intervals.

CHAPTER 2

Latin America: The Next Big AI Talent Pool?

Fabio Caversan and Marco Stefanini

Stefanini

This chapter assesses the scope of Artificial Intelligence (AI) science and technology in Latin America, and Stefanini's vision of current and future scenarios. The global challenges when it comes to AI are significant, and it's no different in Latin America. There are a number of Latin American countries leading AI initiatives—not only in the region but also globally—and these countries are also well-ranked globally in terms of AI development. Finally, at Stefanini we genuinely believe that this unique moment offers a historic opportunity for Latin America to become a global development and delivery leader for AI technology.

CURRENT LANDSCAPE

Among the many requirements and enablers necessary to evolve in the AI field today, entrepreneurship is vital. As technology advances, limited resources present a challenge; however, it is possible to become a player—and even challenge global leaders—with the right amount of creativity and hard work.

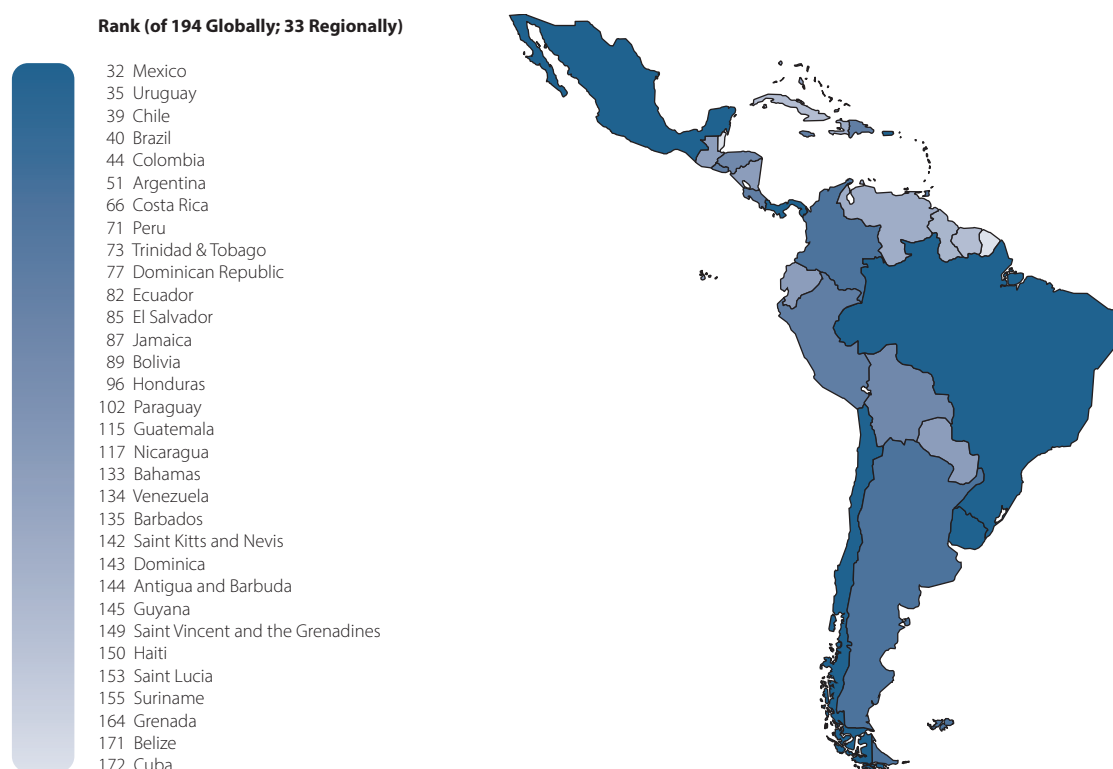
Regarding entrepreneurship, last year's *Global Talent*

Competitiveness Index report demonstrated that entrepreneurial activity in Latin America is very modest.¹ The report highlights Chile and Mexico as having robust entrepreneurial talent, which aligns perfectly with the latest AI initiatives in the region, as demonstrated in the latest AI readiness rankings of the Government Artificial Intelligence Readiness Index 2019.

The index evaluates AI readiness globally, merging information from several sources such as the United Nations, World Economic Forum, Global Open Data Index, World Bank, Gartner, and others.² The ranking system takes into account:

- **Governance:** Indicators include whether a country has privacy laws in place and a forthcoming AI strategy.
- **Infrastructure and data:** Indicators include the availability of open-sourced data, data capability within the government, and the government's procurement of advanced technology products.

Figure 1
AI readiness in Latin America, 2019



Source: Oxford & IDRC (2019).

Note: Darker blue is lower score; lighter blue is higher score.

- **Skills and education:** Indicators include digital skills among the population, innovation capability by the private sector, and the number of registered AI start-ups.
- **Government and public services:** Indicators include government effectiveness, availability of digital public services, and the importance of information and communication technologies (ICTs) to government vision for the future.

The Skills and education pillar of this system is especially critical. To better understand the evaluation framework, the pillar's component details are outlined below:

- **Technology skills:** serve as a proxy for AI skills in the general population. This is important both as an indication of skills in the public sector as well as of the available pool of local talent.
- **Private sector innovation capability:** measures the readiness of the private sector to develop the AI tools needed by government.
- **Number of AI start-ups:** measures, similar to the previous indicator, the readiness of the private sector to develop AI tools and solutions for government.

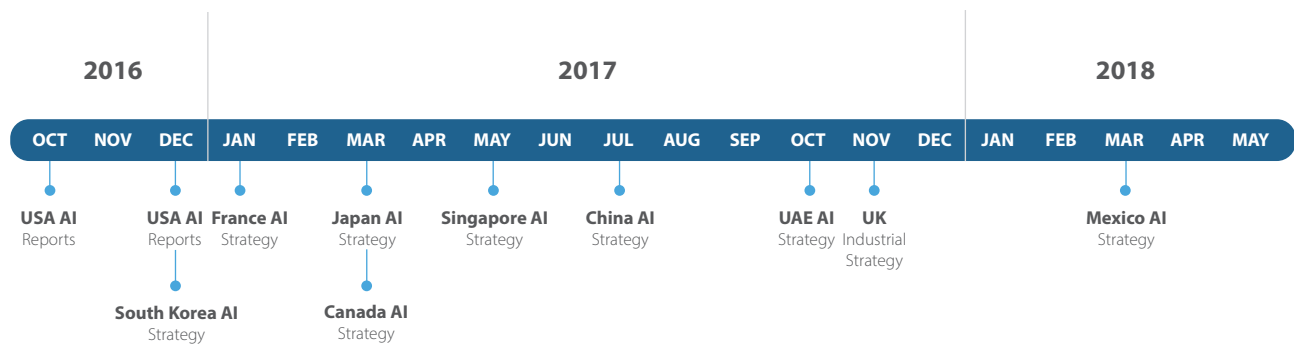
Figure 1 shows the AI readiness rankings for Latin America. The top four countries are Mexico, Uruguay, and Chile, followed by Brazil, and their initiatives can set examples for the entire region to successfully and effectively initiate or sustain AI development.

It is also worth noting that the bottom part of the list presents countries in the region with very low rankings for AI readiness, emphasising one of the region's key concerns: the gap between leading and trailing companies in the race. The challenge is recursive in nature: it exists globally among all regions, among the countries within Latin America, and within each country, among its divisions.

Mexico

In 2018, Mexico was one of the first 10 countries to launch a national AI strategy.³ Before Mexico, only seven countries had announced a national AI strategy: Canada, China, the United Arab Emirates, Singapore, South Korea, France, and Japan. Some countries have AI strategies under another name. The United Kingdom's Industrial Strategy contains significant AI policy proposals, which, combined with an extensive independent review, makes the United Kingdom another world leader in AI policy. In the United States, three reports completed under the Obama administration, including a research and development (R&D) strategy, demonstrate America's own potential policy approach.

Figure 2

Timeline of AI strategies and policy statements

Source: Martinho-Truswell et al. (2018).

Mexico was the first country in Latin America to publicly announce a national AI strategy. Figure 2 shows the timeline of the various country strategies and policy statements.

See below the initial framework of Mexico's national AI strategy:⁴

- Creation of a sub-commission for AI within the existing Commission for Development of the Electronic Government
- Mapping use cases and needs of industry, and identifying best practices within government
- Promoting Mexico's international leadership in digital policy, following Organisation for Economic Co-operation and Development (OECD) policies
- Opening up the recommendations of the report for public consultation
- Working with experts and citizens through the AI sub-committee to ensure the continuity of these efforts with future governments

Unlike the other countries, Mexico has focused on the social impacts of AI, with case studies using AI to achieve social goals, such as increasing financial inclusion, combating corruption, improving public health, and reducing crime. There is a unique vision among groups that focus on using AI ethically and responsibly to ensure that AI can promote benefits for all Mexican citizens.⁵ This focus, combined with the closeness to economy and cultures of both South and North America, places Mexico in an ideal spot to progress rapidly in AI.

Uruguay

Following Mexico, in April 2019 Uruguay established a public consultation to create an AI strategy for the digital government. It was divided into four phases, and at the time of publication,

the fourth phase of the consultation was already underway. Final documentation is expected to be ready by the end of 2019.⁶

Part of Uruguay's strategy is that anyone—regardless of whether or not they are from Uruguay—can add comments and suggestions to the plan, to be submitted for revision. To date, the four pillars of the strategy are:

- 1. AI governance in public administration:** Ensure principles comply with the recommendations indicated in the AI strategy document. The main goals are to identify the existing AI ecosystem in Uruguay and define a governance model.
- 2. Development of AI capabilities:** Foster the generation of the skills necessary to develop AI in public administration and knowledge exchange between public and private, and national and international AI initiatives.
- 3. Use and application of AI:** Generate technical guides for the proper use of AI in public administration, promote transparency of used algorithms, and design specific action plans in strategic sectors.
- 4. AI and digital citizenship:** Develop public awareness and trust as well as campaigns to inform citizens about AI and how it is being used by the public administration. Promote the development of digital intelligence to enhance involvement, participation, and apprehension in the development and application of AI solutions.

Chile

Start-Up Chile (SUP) is a public start-up accelerator created by the Chilean government in 2010 to help entrepreneurs bootstrap their start-ups and use Chile as a foundation. Today, Start-Up Chile is the leading accelerator in Latin America, among the top 10 globally, and one of the biggest and most diverse start-up communities in the world.⁷ Businesses also receive mentoring, workshops, co-working office space, and access to

investors. In return, they are asked to give something back to local society—such as taking part in hackathons or giving talks at universities.⁸

Entrepreneurs are encouraged and supported by government incentives and programmes, along with the proper technical education. Currently, SUP has approximately 20 start-ups focusing mainly on AI, in addition to the start-ups that use AI indirectly in Aerospace, Robotics, Smart Factories, and other sectors.

Furthermore, in August 2019, Chile's president announced a plan to enable Chile to participate successfully in the fourth industrial revolution. The Ministry of Science, Technology, and Innovation will be responsible for developing an AI strategic plan, which will entail innovations in various areas such as healthcare, education, and production. The process will happen in 2020 and will address three main areas:

- The elements required to enable AI, such as specialist human skills, fibre-optic networks, and computational infrastructure
- How AI should be developed and used in Chile
- The ethics, standards, security, and regulations that should apply to this technology

Brazil

Brazil has defined a strategy for digital transformation that will include AI, among several other dimensions.⁹ The government already approved the document, which presents the vision and strategic actions it will execute to leverage a digital transformation within institutions and throughout the entire economy. The plan is divided into seven main aspects: infrastructure, R&D, privacy and security of digital data, education, international digital relations, digital economy, and, finally, digital citizenship and government.

AI is included as part of R&D, but it can also be found in other directives. Brazil's government recognises a need for a specific strategy addressing AI, and its Ministry of Science, Technology, Innovation and Communications (MCTIC) is engaged with UNESCO to start planning the process. One of the elements of the plan is to have a public consultation, similar to the one executed by Uruguay, in late 2019 or early 2020.

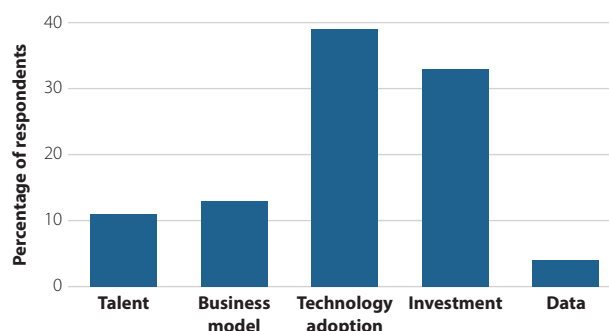
Brazil is also engaged in international discussions about AI and has adopted the recommendations of the OECD's Principles on Artificial Intelligence. Data available from MCTIC indicate there are already incentives from the institutions to around 60 start-ups focusing on AI in the country.

OPPORTUNITIES AND CHALLENGES

Although Latin America is not entirely out of the AI game—and the region has good examples of AI initiatives among the top-ranked AI-ready countries—there are still a lot of challenges to positioning the region as a relevant global player. According to research by Endeavor, which surveyed more than 240 companies in Latin America, these major challenges include:

Figure 3

Main challenges to AI development in Latin America



Source: Endeavor (2018).

Note: Survey respondents were asked to identify the biggest challenge to AI development in Latin America.

- **Lack of specialised AI talent:** This is not an exclusive Latin America problem, but a worldwide problem.
- **Lack of data to use in AI systems:** The region must start to think more about data gathering. This is a challenge that top-ranked AI countries realized a while ago and are working harder to improve.
- **Insufficient or incorrect understanding of AI technology in the marketplace:** The belief that AI will solve a problem miraculously is fiction. Society must be educated on the realities of the technology.
- **Insufficient funding:** Investments of this kind require a leap of faith and significant financial resources, which are hard to find in the region.

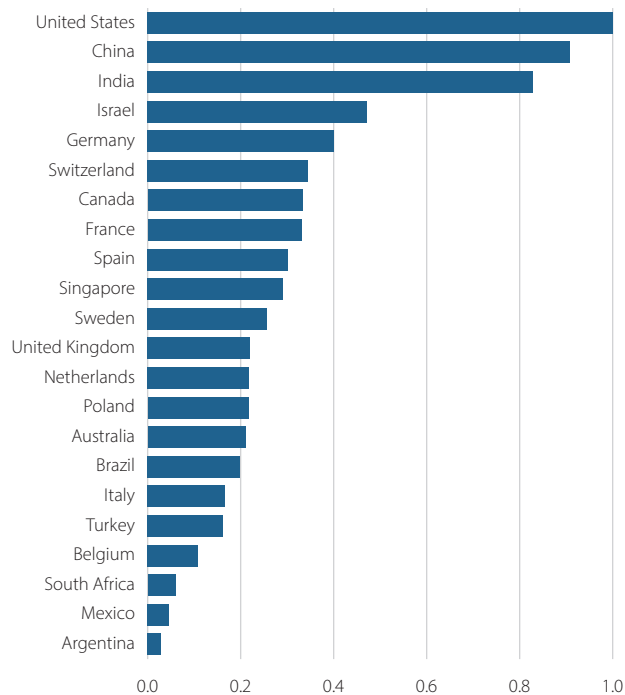
As illustrated in Figure 3, the two main challenges are technology adoption, which is related to the lack of understanding of AI technology, and investment. The survey's results are something to keep in mind when thinking about opportunities for the region: lack of understanding and lack of investment walk hand in hand; given that this dichotomy exists in other regions, this might be a golden opportunity for Latin America.

When it comes to the availability and development of AI talent and skills, LinkedIn's analysis presented in Figure 4 (evaluated by Perisic) demonstrates that AI skills and talent among the workforce in both Brazil (ranked 16th) and Mexico (ranked 21st) is sizable compared to the rest of the world, with a lot of room for improvement to approach the global leaders.¹⁰

The challenge here is that all of the countries ranked above Brazil and Mexico need more people. There is a war for talent among Google, Amazon, Microsoft, Facebook, Apple, Alibaba, Baidu, and other major firms, and they are recruiting and relocating talent out of Latin America if they have the right skills.

From another perspective, if the challenge for Latin America is fostering and retaining skilled talent and entrepreneurs, there

Figure 4
AI skills penetration, by country



Source: Perisic (2018), <https://economicgraph.linkedin.com/blog/how-artificial-intelligence-is-already-impacting-todays-jobs>

Note: Country comparison is benchmarked by benching every country against the United States; thus, the country index reflects how much AI skills penetrate a country's occupations relative to the United States over a three-year period. See <https://economicgraph.linkedin.com/blog/how-artificial-intelligence-is-already-impacting-todays-jobs> for more details.

also need to be analyses of the activities of the majority of the workforce. McKinsey & Company, for example, has estimated the number of full-time equivalents (FTEs) that will be automated by 2030 in various countries and regions globally, including Latin America.¹¹ Its research forecasts 15.7 million FTEs will be automated in Brazil, 8.8 million in Mexico, and just 0.2 million in Costa Rica. By contrast, estimates for China (111.2 million) and the United States (38.6 million) are much greater, illustrating further why Latin America must start to take action as soon as possible to align with advancements in AI.

AI automation is inevitable and is going to strike countries in Latin America hard. The region must immediately start the necessary and fundamental actions to shift the workforce towards the new roles and challenges required by this potentially large market.

Looking more deeply at what AI skills are currently most prevalent in the region, analyses from Endeavor reveal that the majority of the companies in Latin America that are applying AI technologies in their businesses are working primarily with classification (58%), prediction (58%), and natural-language (52%) related technologies. Interestingly, these technologies are on the fringes of the field at the moment.¹²

To build such applications, one concern is whether companies are working in basic or even applied research to expand

the boundaries of the AI field, or if they are leveraging current technologies to do so. Additional research from Endeavor demonstrates that, for now, Latin America is using, like most of the world, technology developed and made available from large AI technology enablers to build their AI applications. For example, 42% of companies analysed have purchased Microsoft AI services while 32% are using Google Tensorflow.¹³

The resources and talent required to expand the field of AI in Latin America today are certainly a huge challenge. Yet it is clear—when analysing the data presented in this chapter—that there are also a lot of opportunities in the region:

- A few countries in the region are well positioned in terms of governance, skills, and infrastructure in the AI field.
- Market adoption and investments are still low in terms of volume.
- Much of the region's workforce could be replaced by AI systems.
- Talent already exists but, just like the rest of the world, is not enough to handle the need.

Although these can be viewed as challenges, together, they also present a historic opportunity to transform Latin America into a large AI talent pool. Opportunities can be evaluated for their short- and long-term effects and grouped into three aspects: (1) people, (2) infrastructure, and (3) science, technology, and investments.

People

Whether in the short or long term, Latin America needs to heavily drive the workforce towards AI skills. People are the most important aspect of the technological revolution. However, with the exponential advances of technology, the main challenge, as discussed in last year's *Global Talent Competitiveness Index*, is how to prepare people for future jobs.¹⁴

In the coming decade, it's likely that many professions will be extinct, and that several others will rise. This will require people who are well prepared for learning new skills. AI is a rich field not only for applications within AI; but AI also empowers advances in other fields, like autonomous vehicles, quantum computing, and brain-machine interfaces. What professions will emerge when highly theoretical research becomes a product that we use daily? Furthermore, how can Latin America prepare its workforce for that future?

Arguably the most important skill is the ability to learn and adapt. The ever-growing worldwide knowledge gap is also increasing in Latin America: people with more resources can access the best tools and education, leapfrogging them ahead of the overall population. Fortunately, technology has enabled alternatives that offer opportunities to more people as well.

Initiatives like the Khan Academy¹⁵ and Code.org¹⁶ are good examples of how knowledge can be available to everyone. Those were pioneers in the field, funded by large companies (also in search of talent). Today, there is a wide range of similar tools, and many are free or affordable. As more and more content becomes available online—especially related to AI—it is

Table 1

Research in AI in Latin America

INSTITUTION	MAIN LOCATION	REFERENCE
Universidad Nacional Autónoma de México	Mexico City, Mexico	https://www.unam.mx/
Instituto Tecnológico y de Estudios Superiores de Monterrey	Mexico City, Mexico	https://tec.mx/es
Universidad de la República del Uruguay	Montevideo, Uruguay	https://www.fing.edu.uy/
Universidad de Chile	Santiago, Chile	http://www.uchile.cl/
Universidade de São Paulo	São Paulo, Brazil	https://www5.usp.br/
Universidade Estadual de Campinas	Campinas, Brazil	https://www.unicamp.br/
Advanced Institute for AI (AI2)	São Paulo, Brazil	https://advancedinstitute.ai/

important to make sure the population in Latin America has access to these resources. Simply put, everyone needs access to the internet.

People also need to be convinced of the *value* of these skills. The localisation of the content—not only in terms of language, but also cultural adaptation, resources, and education levels—is important as well. The goal is to raise awareness among young people of the importance of science computing skills for the future, regardless of their experience with software coding. Companies and organisations can help with minimal investments to drive more and more people towards these skills.

Stefanini Brazil, for instance, has partnerships with several research centres and universities, like TECHNOPUC (Scientific and Technological Park of PUCRS)¹⁷ and CESAR (Recife Center for Advanced Systems Studies),¹⁸ with offices inside the institutions. R&D projects are conducted with students and company professionals, creating a symbiosis providing real projects skills for future professionals and low-cost talent preparation for the company.

The client education side is no different: for about 20 of its biggest clients in Brazil, Stefanini created joint project teams (named *AI Squads*) that bring together business experts (usually from the client side) and AI and Cognitive Science experts (usually from Stefanini's side) to help, initially, educate the client on what can and cannot be solved with the current status of the technology, designing the solution, and, finally, implementing it.

Infrastructure

Based on the need to spread new knowledge throughout the region, access to technology devices, particularly the internet, is paramount. Nowadays, there is no need to compete for room-size computers; yet there is still a need for a minimum number of resources. Fortunately, there is more and more content available for anyone eager to learn. Here, too, localisation of content and programmes to advertise the importance of the necessary knowledge can help lead to better awareness and adoption.

Once talent with the right skills to work in AI solutions is readily available and accessible, companies that are prepared can accelerate the process of building out their AI capabilities. AI can

indeed work with unstructured and incomplete data, but it can work even better if the data are organised and clean. Furthermore, many businesses in Latin America have not taken the first steps of collecting and storing data digitally. Governments and companies have much to gain if they prepare themselves with the foundations that can speed AI initiatives.

The new revolution in AI can start anywhere. That's why focusing on the research and the creation of technology is also critical. In the AI field, it's possible for anyone from anywhere to come up with a new algorithm or technique. It's important to recognise that resources like nanotechnology and quantum computers will be part of the next revolution. These are more difficult technologies to prepare for, partly because they will require a lot more of investment and resources.

Science, Technology, and Investment

Evaluating the AI profiles of companies in Latin America, many are working with the technology, and the majority are using third-party frameworks, including Google, Microsoft, IBM, and Amazon. There is no doubt that the ability to efficiently implement AI, with the support of these platforms, is important for the region, and it is arguably the most important skill set needed.

Nevertheless, AI initiatives cannot discount the importance of the more basic side of scientific research. A healthy technology ecosystem needs to encompass the entire cycle, from scientific research to more applied research, and finally to the applications themselves. In practice, however, the maturity of this cycle often develops backward, starting from the applications. This is not a problem, but Latin American companies looking to hire and retain AI talent cannot take their attention away from the entire process.

In fact, there are a lot of universities and research centres in the region, already working to expand the boundaries of the AI field. Table 1 lists a few examples. From courses and events related to AI to start-up incentives, these institutions are helping to increase the AI talent pool in the region.

One particular initiative of note is the Advanced Institute for Artificial Intelligence (AI2), which was established in 2018 by researchers from São Paulo's biggest universities. The institute aims to help improve society as a whole and, in particular, foster

growth in this area to help Brazil engage in the state-of-the-art advances in the field. AI2 is a good example of a partnership between academic and private institutions that brings cutting-edge scientific tools to Brazil that are not readily available in the region.

The path to successful AI development begins, at a minimum, with internet access that can enable the population to obtain the basic skills. A few countries in Latin America are already at this initial stage, although internet access does yet not reach the entire population. Beyond internet access, people will need access to devices or cloud services that provide access to proper AI-specific tools. The final stage is to work and research with state-of-the-art platforms and equipment. This final challenge can be addressed only when the first two are solved. Ongoing development of the region might enable access to more advanced technology in the future.

CONCLUSION

The AI revolution—like many revolutions in history—presents challenges, opportunities, and risks for governments, countries, and workers in Latin America. Opportunities and risks are alike, though at opposite ends of the spectrum: We can drastically either increase or decrease the growing gap that exists today between the population with access to resources and those without it. Technology can be a blessing, a curse, and—more often than not—both.

After analysing many countries' strategies, it is clear there are a lot of similarities throughout the region: public consultations, a focus on the social aspects, and talent fostering. At Stefanini, we propose that Latin America countries try to gather and create a joint strategy for AI in the region. That would increase the potential of the region to be an AI talent pool.

People must be educated and trained in the AI field. Short-term requirements include mathematics, computer science, and AI tools. For the long term, talent must develop skills in neuroscience, machine learning, and, especially, problem-solving, in addition to self-learning, adaptation, and mindset. There are also other job roles not necessarily threatened by automation but that are helpful for AI development: artists and designers, computer engineers and specialists, education professionals and support workers, and managers and executives.

We believe it is important for companies to invest in the AI field—preferably, joining or creating one of the AI centres in the region. This could be an opportunity to attract investment from the leading AI countries in Latin America since there is a war for talent in the area and talent is getting more expensive in the world's leading AI countries.

Finally, we would like to restate that it is a truly golden opportunity in Latin America to become a 'global delivery centre' for AI applications and projects. Doing so will help draw investments from leading countries looking for talent. It's worth noting that governments and companies must plan to retain the talent in the region. For example, approximately 20 years ago India positioned itself as a general Delivery Center of IT. Looking at how high the country is ranked in Figure 4, it is clear the strategy worked.

As the AI revolution takes off in Latin America, people will be driven towards the field. We believe that will help to reduce social inequalities and increase the likelihood of basic research flourishing throughout the region. If institutions take this opportunity now, they will not only be able to apply the technology to properly develop the region, but also effectively participate in the creation of new science fields and technologies that will shape the future of humankind.

ENDNOTES

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- 2 Oxford & IDRC (2019).
- 3 Martinho-Trusswell, et al. (2018).
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- 9 E-Digital (2018).
- 10 Perisic (2018).
- 11 McKinsey & Company (2018).
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- 13 Ibid.
- 14 INSEAD (2019).
- 15 Further information about Khan Academy is available at <https://www.khanacademy.org/>
- 16 Further information about Code.org is available at <https://code.org>
- 17 See <http://www.pucrs.br/tecnopuc/> for more information.
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A SPECIAL GTCI INTERVIEW

AI and Talent Competitiveness: Luxembourg and the European Union

An interview with Nicolas Schmit

European Union Commissioner for Jobs and Social Rights

The advance of Artificial Intelligence (AI) technologies is not only changing the nature of work but also forcing a re-evaluation of workplace practices, corporate structures, and innovation ecosystems. As machines and algorithms continue to absorb a multiplicity of tasks and responsibilities and almost every job gets reinvented, the right talent is required not only to adapt but also to capture value from this transformative technology. At this critical juncture, it is important to understand how strategies for embedding AI in corporate settings and institutional frameworks compare in different countries.



In September, 2019, the GTCI team conducted an interview with Nicolas Schmit, before he became European Commissioner in charge of the 'Jobs and Social Rights' portfolio, to learn about how his native Luxembourg is approaching the opportunities and

changes brought about by AI as well as the prospects and challenges for the European Union as a whole.

In terms of AI and talent, a human-centric approach is generally considered necessary. Why do you think that is? Are smaller economies such as Luxembourg advantaged or disadvantaged in that context?

Nicolas Schmit:

We are aware that Luxembourg's future lies with being very high performing in new technologies, especially in ICT [information and communication technologies] and the development of these technologies and their application. I think it's important for all countries and for all economies. But it's even more important for a smaller country that is very much focused on services. First, we have to keep a very high level of good performance overall and specifically in ICT networks. So infrastructure and particularly information infrastructure is of utmost importance (i.e., there must be high-speed internet everywhere). To achieve this you need a strategy to implement that. The second element is the diffusion of new technologies in the economy and in the

society. This might distinguish this new technological revolution from the previous ones. This is not a revolution affecting just the economic sector, but also the whole society. It is important that you favour a positive and open though also critical attitude towards this technological revolution. This means also that you have to provide guarantees in terms of data protection and privacy, for example. Another point, which is very important for me, is the human aspect: It is crucial because when people talk about the fourth industrial revolution, they always think about AI. They think about robots and so they forget the most important, which is the human perspective. We need to keep control and command over technology to ensure that our values are not lost in the process. Establishing the required new relationship between humans and machines is a massive challenge.

We also need to master globalisation: Hypercompetitive wages and the massification of production in goods and services will be emphasised by the rise of AI. This should be of particular concern to smaller economies. More generally, AI will also need to be embedded in corporate settings and institutional frameworks. The more intelligent the machines are, the more we can get out of them: They can be of tremendous help and transform our world of work. Certainly, this will change industrial patterns internationally. But we have to make sure that we still have control over the processes involved, as they will affect all dimensions of our lives: Data are the 'new oil' in all sectors from health to energy, from mobility to finance, and they are now usable in ways that could not be envisaged before. Now we start to have possibilities for really exploring and exploiting these data. This not only changes the economy, but also creates new economic possibilities. I think this is a great opportunity for everyone, regardless of whether we live in a large or a small country, because it transcends national borders.

As AI becomes the obvious liaison between data and society's most valuable products and services, how can it become a concrete source of competitive advantage, and what opportunities do you see that AI will offer?

Nicolas Schmit:

In the example of Luxembourg, we want to be a *data hub*. Therefore we have to encourage ways to own or share the really big powerful computers that can handle big data. Such an approach will have a significant employment impact, as repetitive jobs vanish and new ones are created. Some sectors, like finance—which is key to the economy of Luxembourg—will be deeply transformed: Tomorrow's banks will be closer to fintech's. This means that the changes to come will not be just technological but also organisational. For a small economy like that of Luxembourg, this implies the ability to make strategic choices very swiftly.

For many observers of talent worldwide, Luxembourg is a typical example of the consequences of brain gain;* the country has now reached the top 10 in GTCI rankings. How replicable is such a strategy? More generally, how can countries produce, attract, grow, and retain talent in the age of AI?

Nicolas Schmit:

Well, our world is a world of competition where no country should rest on its laurels. Winners are the ones who are permanently proactive (as opposed to reactive) and have an ambitious digital strategy that they can reinvent every day. This is what innovation is about. But we also have to promote cultural and social innovation. This implies huge investments in education, and in the required continuous up-skilling of the workforce. We have to adopt the frameworks legally but also financially, to make a country all the more attractive to the outside world. I believe that's what Luxembourg, at the country level, has been good at, and this helped us retain our talent (born and educated here), not to mention our capacity to develop in fields such as medical sciences and health, where research is being conducted thoroughly via the use of AI.

What makes a country attractive for global talents? I would say having good living conditions, safety, social protection and social services, good education, good jobs, interesting cultural offerings, a clean environment, a good pension system, and finally connectivity to other European cities are all crucially important. All the above create a very positive and sustainable ecosystem (sustainability being highly regarded by highly educated talents) that benefits from technology and AI. Simultaneously, countries also need to work on their weaknesses (for example, in Luxembourg housing is expensive—both for locals and expats—but the fact that public transportation will be free as of 2020 is seen very positively). The goal is for the citizens to feel as though they're contributing to the country's success, while managing to be even more successful themselves! As such, they offer their knowledge and competencies in exchange for recognition. Overall, countries should meticulously choose which are the areas where they can really develop excellence, as this creates a positive dynamic. This circles back to the importance of talents in a globalised economy. In such a complex world, Luxembourg made some efforts to be a bit less complex—that is, making things easier for start-ups and individuals (i.e., immigration, welcoming culture and being cosmopolitan, for example), simply because technology is more or less the same everywhere, so at the end of the day, what really makes a difference are the soft skills. A creative branding of the country—based on realities and not just dreams—is therefore a must.

*Luxembourg is the second-largest financial centre in the world and the first in Europe, with 144 banks, more than 3,800 investment funds, and 320 insurance and reinsurance and 10 payments institutions.

How can we aim to include AI skills in European governments' talent strategies and modernise Europe's education and training systems?

Nicolas Schmit:

One of the big challenges that some countries may have is to figure out how to deal with all the anxiety around AI potentially cancelling the need for certain jobs. People get afraid of what's going to happen to their roles and to their companies. I didn't have really the feeling that in Luxembourg people are so scared about that aspect. Why? Because, globally speaking, the labour market is still good. So the people who are worried might be the ones already facing certain levels of unemployment, coupled with some resistance to work in a field that's different from the one in which they studied or specialised. Hence the importance of up-skilling and re-skilling. As a Minister, I contributed to the creation of a special school, Fit4Coding,* teaching people from different areas how to code over a four-month period. The success is very encouraging (after three months, 80% of them found a job). I'm not a pessimist regarding the future of AI and jobs, as I believe this future depends on us, on how we organise the world of work—probably we have to totally change the way people work. This can translate into greater opportunities.

All in all, I believe workforces must be re-skilled much more often, whether this process touches on hard, soft, or technical skills. There will therefore be a greater overlap between education and professional lives. As technology becomes more and more autonomous, the idea behind the notion of a 'skills bridge' is that first we want to encourage companies to develop their own digital strategies as fast and as efficiently as possible, and to anticipate what kind of new technological change they will have to adapt to. Only then can they start working on reducing and filling the identified skills gaps, collaborating with social partners as needed. Along with re-skilling the workforce, we have to up-skill and create programmes to do so (promoting mobility between firms and even between sectors). I would imagine that governments would support that, and individuals would keep their salaries during a hybrid work/training professional transition. Looking for alternative jobs when one is made redundant is another challenge, and we shall have to reduce the periods of unemployment during transitions. However, re-skilling is only second best: Up-skilling remains the optimal solution. We should always fight for a win-win situation. Lifelong training and vocational training are therefore crucial resources and should be expanded to all kinds of jobs. More and more universities are taking this approach because individuals are more and more keen on learning during their entire lives—this undoubtedly benefits society!

As a European Commissioner in charge of the Jobs and Social Rights portfolio, what is your plan of action to harness digitalisation as a tool for positive transformation in the long run, and to leverage AI and innovation to ensure global competitiveness?

Nicolas Schmit:

Personally, I believe that in such complex endeavours, collaboration is key. I look forward to collaborating with other Commissioners—mainly with Margrethe Vestager, who oversees the digital portfolio, because I think employment and digital are undeniably intertwined. I am also looking forward to working with Frans Timmermans, the Commissioner in charge of Sustainable Development & Climate, because this also has a very strong impact on employment. We really have to make sure that there is good coordination between those who are in charge of such key areas and what happens on the employment front, and how job transfers can be organised in a harmonious and sustainable fashion. Moreover, we should learn from each other as the increasing need of AI mostly translates into a social transition, which is key to an efficient technological transition involving skilling, social protection, and social cohesion. As AI will transform everything—from the way we produce to how we consume and how we drive our cars, for example—we should really put the right resources into development, into research, into attracting talents, and into placing Europe at the highest level of this technological development, to better position Europe as a technological frontrunner on the global stage. With the current United States–China duopoly, this sense of urgency needs to be communicated. There is also, in parallel, a productivity debate as productivity gains seem to have slowed down, possibly since we are creating a lot of jobs where productivity is low (i.e., certain services), and also partly as a result of our slowing demographic evolution. Could this challenge be somewhat compensated for by AI and more sustainable technologies? This, for me, is one of the key challenges for Europe in the coming decade.

Can we hope for a narrative able to explain the challenges and the opportunities of AI to a broad and diverse population such as the European one?

Nicolas Schmit:

Indeed, the risk is that one can be afraid of the AI revolution, in the same way that there were risks in previous industrial revolutions. This is a narrative we have to work on. Technology should not be discriminatory. We need to make it open to as many people as possible. Particular attention should be paid to addressing the gender gap, for example. Macroeconomics is the responsibility of governments. But the most immediate effects

*For information about the Fit4Coding initiative, see <http://luxembourg.public.lu/en/actualites/2016/10/17-fit4coding/index.html>

of AI will be felt at the micro-level—that is, the organisation level. Hence, we need to enhance the narrative at that level. As I mentioned before, we need to keep the ‘broader picture’ in mind, and to consider sustainability, climate change, and the need for a human-centric approach to technological change. Hence the need to redesign the way companies function and how we produce, and which criteria should be used to define successful companies. This is a big challenge because it goes to the core of our economic system. This is particularly important for younger generation, for whom values and meaning are key; this is why I plan on collaborating with the new Commissioner for Innovation and Youth, Mariya Gabriel. I personally believe in the power of dreamers and in the wisdom of the next generation of leaders, and all that we can all learn from their fears—but also from their hopes. There is clearly a worldwide need for a stronger Europe, leading towards the notion of a more ethical AI model, that should be somewhere between government-controlled models (such as China’s) on one hand and the highly capitalistic hypercompetitive approaches that prevail in countries such as the United States. Europe can and should insist on giving the highest priority to values and ethics. AI may be one of the key areas in which Ursula von der Leyen’s Commission will carry a visible and operational value. Such an ethical approach is highly valuable: It should not make things impossible, but it should also put clear limitations when necessary. As such, technology should be a tool to promote democracy through AI, and to measure its impact in our global, hyper-connected world.

As so many jobs are being reinvented and increasingly automated, which jobs are, in your opinion, the most exposed to competition from AI? Which soft and hard skills do you believe should be developed as a priority in such a context?

Nicolas Schmit:

First off, all jobs will be transformed at some point or another, hence the re-skilling imperative. Second, the more repetitive a job is, the less creative it is, and the less room for initiative there is in it, the more easily it can be replaced by machines. So the challenge will be to improve living conditions and the environment, to care for the elderly and children, and so on and so forth. So, we have to rethink in that way, which means that we have to organise the transfer for very highly performing sectors through these activities. For example, why do we need a radiologist when machines can work on conducting exams and compare millions of X-rays and MRIs [magnetic resonance imaging scans]? The radiologist will still be important in the end because the machine will provide only the analyses—the radiologist still needs to make the final decision, communicate it, and take the patient through a human-to-human conversation. Therefore, the soft skills (communication, empathy) will remain crucial, and need to be emphasised in our education systems.

Now, certainly some jobs will disappear. But there will also be jobs created. We do not know which ones exactly—yet!—but we need to be prepared. In Europe, there are hundreds of

thousands of vacancies in the ICT sector that we cannot fill. This shows that our system that produces talent is lagging far behind current and future needs. This is due to the inadequacy of our education system, but also to a lack of awareness among many young people, who have difficulties envisaging their future and the training they should aim for. These gaps have been reduced and there is going to somehow be a competition that is going to be even more acute in AI to identify and address those gaps. For any minister of labour, this is a very difficult equation to resolve over the course of a few years’ mandate. I believe we should be more creative in thinking about fundamental changes and not just looking at typologies and employment slots. Business for good, as they say, also should be good for business. In a time of major disruptions, like climate change and deep technological transformation, companies have to rethink their organisational model. It cannot be focused on the short term and on maximisation of profit. Their purposes should be much larger. This is also a revolution we need if we want to be up to the vital challenges of our time. To miss this could have disastrous consequences. This is an area where Europe can make its mark, and it will be also one of my key objectives as EU Commissioner for Jobs and Social Rights.

CHAPTER 3

Preparing for Economic Transformation through Human-Centred AI

Karine Perset, Andrew Wyckoff, and Alistair Nolan

Organisation for Economic Co-operation and Development (OECD)

Artificial Intelligence (AI) is an emerging general-purpose technology with the potential to improve prediction and enable better decision-making—leading to enhanced productivity and improved well-being—and address complex scientific and societal challenges.

As it diffuses across the economy, AI is expected to change the nature of work, complementing humans in some tasks, replacing them in others, and generating entirely new types of work. Apart from routine manual and cognitive tasks, AI technologies are beginning to perform a range of non-routine and hard-to-codify tasks across the skills spectrum. AI has the potential to augment labour productivity, raising demand for workers and creating job opportunities. Profound changes in labour markets associated with AI will require policies that help workers in all functions and all sectors of the economy to adjust.

As jobs change, so will the skills required of workers. AI is expected to increase demand for three broad types of skills:

(1) specialist skills to programme and develop AI applications, such as skills for fundamental research, engineering, AI applications, data science, and computational thinking; (2) generic skills, which form the basis for continuous acquisition of new technical skills in a world where technological change is rapid; and (3) skills that are complementary to AI, such as critical thinking and creativity. Education and training policies will have to adjust to strengthen skills development. Also needed will be new educational initiatives, changes to curricula, better and more comprehensive systems of lifelong learning, and the use of advanced digital technologies to deliver skills.

In addition to its impact on the workforce, AI could widen economic divides between people, companies of different sizes, and countries and continents. That's why policies and programmes should work to minimise negative outcomes and broaden access to AI for individuals, companies, and sectors in danger of being left behind—while also addressing issues of AI

Note: Avi Goldfarb, University of Toronto, and Mario Cervantes, Senior Policy Analyst for the OECD, collaborated on the development of this chapter.

safety and privacy. Given the possible scale of AI's impacts on the labour market, and the likelihood that many in the workforce will need to adapt, up-skill and re-skill, and other concerns raised by AI, stakeholders across all sectors of government, industry, and policymaking will need to develop human-centred approaches to AI.

ECONOMIC CHARACTERISTICS OF AI

AI Enables Prediction for Decision-Making

Recent advances in AI can either decrease the cost of prediction or improve the quality of predictions available at the same cost. Better prediction can generate new knowledge used to create new products and services, improve labour productivity, and decrease the material inputs used per unit of production, such as energy, which can contribute to sustainable development objectives.

Machine Prediction Can Substitute for Human Prediction

As machine prediction becomes less expensive, machines will begin to substitute for humans in prediction tasks. For example, AI applications can predict the risk of loan default more accurately than bankers. And AI is already quicker and more accurate than most humans in performing transcription, filling in missing information on the set of symbols that match spoken words.

Data, Action, and Judgement Complement Machine Prediction

While prediction is a key input into decision-making, a prediction is not a decision. Decisions require data, actions, and judgement, which can be considered complements to AI. Data comprise the information that goes into a prediction. Some actions are inherently more valuable when performed by a human (e.g., actions by professional athletes, child carers, or salespeople). Perhaps even more important to decision-making is judgement: the process of determining the reward to a particular action in a particular environment.

AI Requires Complementary Investments and Process Changes

AI requires investments in data collection and curation, talent to use the data and engineer essential digital hardware, and process changes to take advantage of new opportunities arising from reduced uncertainty. The scope of opportunities offered by better predictions will vary. For example, Google, Baidu, and other large digital platform companies are well-positioned to benefit from major investments in AI. They already have systems in place to collect data and enough customers to justify the fixed costs of investment in the necessary technology. However, most other businesses have not fully digitised their workflows and cannot yet apply AI tools directly to existing processes. As the costs of implementing AI fall over time, these businesses will recognise the opportunities made possible by reducing a range of uncertainties.

AI AND THE FUTURE OF WORK

As it diffuses across sectors, AI is widely expected to change the nature of work—complementing humans in some tasks, replacing them in others, and generating new types of work.

AI Is Expected to Improve Productivity in a Number of Ways

Some activities previously carried out by people will be automated. AI can also make previously automated tasks better and faster. Machine autonomy enables systems to operate and adapt to circumstances with reduced or no human control.¹ And AI systems will *augment* human capabilities directly—for instance, through AI coaches (research on 12 developed economies estimated that AI could increase labour productivity by up to 40% by 2035 compared to expected baseline levels).² For example, IBM's Watson assists client advisors at Crédit Mutuel, a French bank, to field client questions 60% faster.³ Alibaba's chatbot handled more than 95% of customer inquiries during a 2017 sale, allowing human customer representatives to handle more complicated or personal issues.⁴

Human-AI teams could be more productive than either AI or workers alone through better coordination and circulation of information. For example, human-AI teams in BMW factories increased manufacturing productivity by 85% compared to non-integrated teams. And when a human radiologist worked with AI models to screen chest X-rays for tuberculosis, net accuracy reached 100%—higher than AI or human methods alone.⁵

AI techniques, coupled with big data, could help companies identify suitable roles for workers or match people to jobs. IBM uses AI to optimise employee training, recommending training modules to employees based on their past performance, career goals, and IBM skills needs. Companies such as KeenCorp and Vibe have developed text analytics techniques to help companies parse employee communications to help assess metrics such as morale, worker productivity, and network effects.

Increasing worker productivity could result in higher wages, since each individual employee produces more value-added, higher profits, or lower prices of goods and services for consumers, or a combination of all three. All of these results can support job creation through different channels.

AI is Expected to Change—Perhaps Accelerate—the Tasks that Can Be Automated

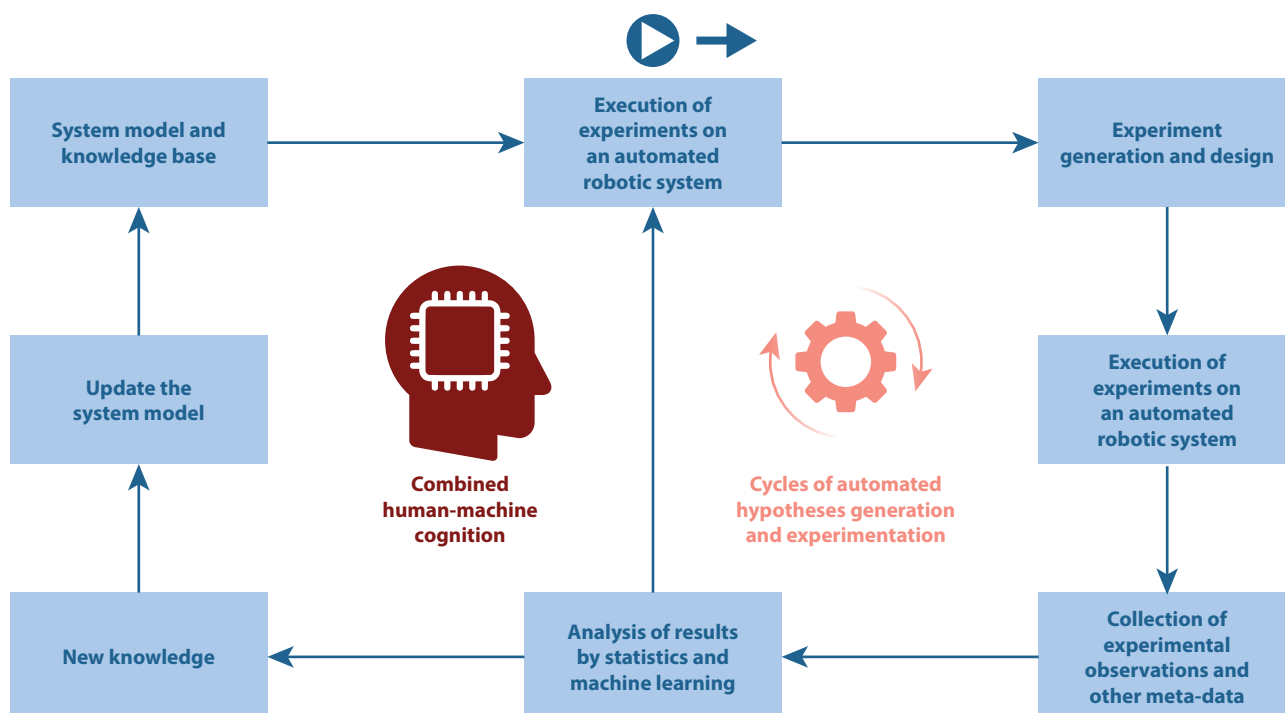
Computers have tended to reduce employment in middle-skill occupations involving many routine tasks. However, AI-powered applications can increasingly perform relatively complex tasks that involve prediction, including transcription, translation, driving vehicles, diagnosing illness, and answering customer inquiries.

AI's Impact on Jobs Will Depend on Its Speed of Diffusion across Different Sectors

Autonomous vehicles, for instance, are widely expected to disrupt driving and delivery service jobs. Established truck companies such as Volvo and Daimler are competing with start-ups like Kodiak and Einride to develop and test driverless trucks.

Figure 1

Hypothesis-driven, closed-loop learning



Source: OECD (2018c).

Some 50% to 70% of the 6.4 million professional trucking jobs in the United States and Europe could be eliminated by 2030.⁶ However, new jobs will be created in parallel, for instance, to provide support services for the increased number of driverless trucks.

AI Technologies Are Also Likely to Impact Higher-Skilled Tasks

AI technologies are already performing prediction tasks traditionally performed by higher-skilled workers. For instance, a robotic lawyer has successfully appealed over \$12 million worth of traffic tickets.⁷ In 2016, IBM's Watson and DeepMind Health outperformed human doctors in diagnosing rare cancers.

AI also has the potential to transform science. For example, AI systems can assist human scientists by extracting information from millions of scientific papers. They can automate, reduce error rates, and improve reproducibility in certain experimental processes. It is already possible to physically implement a laboratory automation system that exploits techniques from AI—combined with robotics—to execute closed-loop cycles of scientific experimentation. Figure 1 illustrates how iterative cycles of hypothesis-driven experimentation allow for the autonomous generation of new scientific knowledge.⁸

AI Can Create New Types of Work

Abilities in critical thinking, creativity, and empathy can complement AI-enabled prediction and increase demand for occupations that leverage those abilities.⁹

- *Data and machine learning (ML) experts.* Specialists are needed to create and clean data and to program and develop AI applications (though they are unlikely to generate large numbers of new tasks for workers).
- *Personal services.* Humans will increasingly perform work to improve each other's lives, such as physical coaching and care for the terminally ill. But even in personal services, machines will likely play a complementary role.
- *Roles requiring judgement to determine what to predict.* When AI is used for prediction, a human must decide what to predict and what to do with the predictions. Posing dilemmas, interpreting situations, and extracting meaning from text requires people with judgement and qualities such as fairness.
- *Roles requiring judgement to decide what to do with a prediction.* A decision cannot be made with a prediction alone; it also requires considerations of individual preferences, for instance.

Predictions Regarding AI's Net Impact on the Quantity of Work Vary Widely

Over the past five years, widely varying estimates have been made of the overall impacts of automation on job loss.¹⁰ Frey and Osborne (2017) predict that 47% of US jobs are at risk of displacement in the next 10 to 15 years.¹¹ The McKinsey Global Institute

found in 2017 that about one-third of activities in 60% of jobs are automatable.¹²

Based on existing technologies, 14% of jobs in OECD member countries are at high risk of automation, and another 32% of workers could see substantial change in how their jobs are carried out.¹³ Recent OECD analysis finds employment decline in occupations classified as ‘highly automatable’ in 82% of regions across 16 European countries. At the same time, the analysis identifies an increase in ‘low automation’ jobs in 60% of regions sufficient to offset job loss. This research supports the idea that automation may be shifting the mix of jobs, without driving down overall employment.¹⁴ Anticipating future job creation in new areas is challenging. One study estimated that AI would lead to a net job creation of 2 million by 2025.¹⁵

AI Will Change the Nature of Work

AI may also help make work more intellectually stimulating by automating routine tasks, allowing more flexible work and possibly a better work-life balance. The diffusion of AI in the workplace also further modifies the duration of work by enabling 24/7 cycles across the globe, and by requiring or enabling greater flexibility in human work hours. AI will enable more automation of dangerous tasks. For example, the current renaissance in space exploration is being enabled by AI-enabled robotic systems that allow machines to carry out tasks too dangerous for humans.

Parameters for Organisational Change Will Need to Be Set

The imperative is growing for new or revised industry standards and technological agreements between management and workers to promote reliable, safe, and productive workplaces. The European Economic and Social Committee (EESC) recommended that ‘*stakeholders to work together on complementary AI systems and their co-creation in the workplace*’.¹⁶ Workplaces also need flexibility, while safeguarding workers’ autonomy and job quality. The recent collective agreement between the German sector union IG Metall and employers (Gesamtmittel) provides an economic case for variable working times.¹⁷

Using AI to Support Labour Market Functions— with Safeguards—Is Also Promising

AI and other digital technologies could improve innovative and personalised approaches to job-search and hiring processes, and enhance the efficiency of labour supply-and-demand matching. LinkedIn uses AI to help recruiters find the right candidates for the right jobs. It draws on the profiles and activities of the platform’s 650 million registered users. And projects to develop labour market information using AI are already underway in Finland, the Czech Republic, and Latvia.

Governing the Use of Workers’ Data

While AI requires large data sets to be productive, there are some potential risks for individual workers. Agreements on the use of workers’ data are emerging in some countries. France’s Orange France Telecom and five trade union centres were among the

first to settle on commitments to protect employee data. Future provisions could include establishing data governance bodies—ensuring accountability with respect to (personal) data use—and agreements on data portability, explanation, and deletion rights.¹⁸

Policies for Managing the AI Transition, Including Social Protection, Are Critical

Labour markets could be disrupted as technology outpaces organisational adaptation. Some sectors are likely to grow, while others decline. Existing jobs may disappear, while new ones are created. Policies for managing the transition include social safety nets, health insurance, progressive taxation of labour and capital, and education and training. Attention should also be paid to competition policies and other policies that might affect concentration, market power, and income distribution.¹⁹

BUILDING THE TALENT BASE TO BENEFIT FROM AI

As Jobs Change, so Will the Skills Required of Workers

As jobs change, so will the talents and skills required of workers. Education policy is expected to require adjustments to expand lifelong learning, training, and skills development. AI is expected to generate demand in three skills areas. **Specialist skills** will be needed to programme and develop AI applications. These could include skills for AI-related fundamental research, engineering, and applications, as well as data science and computational thinking. **Generic skills** will be needed to acquire more specialised skills as technology evolves. AI will also need **complementary skills**, such as critical thinking, creativity, and know-how relating to entrepreneurship.²⁰

Initiatives to Build and Develop AI Skills Are Required to Address Growing AI Talent Shortages

Small and medium-sized enterprises (SMEs), universities, and research centres already compete with dominant firms for talent. Initiatives to build and develop AI skills are emerging in the public, private, and academic sectors. For instance, the Singaporean government has set up a five-year research programme on governance of AI and data use at the Singapore Management University.²¹ The Massachusetts Institute of Technology (MIT) has committed \$1 billion to create the Schwarzman College of Computing, which aims to equip students and researchers in all disciplines to use computing and AI to advance their disciplines.

Some countries have begun streamlining immigration processes for high-skilled experts. For example, the United Kingdom doubled the number of its Tier 1 (Exceptional Talent) visas to 2,000 a year and streamlined the process for top students and researchers to work there.²² Similarly, Canada introduced two-week processing times for visa applications from high-skilled workers as well as visa exemptions for short-term research

assignments—part of its 2017 Global Skills Strategy to attract talented workers and researchers from abroad.²³

All OECD countries assess skills needs over the medium and long term. For example, Finland proposed the Artificial Intelligence Programme, which includes a skills account or voucher-based lifelong learning programme to create demand for education and training.²⁴ The United Kingdom is promoting a diverse AI workforce and investing about £406 million (\$530 million) in skills focusing on science, technology, engineering and mathematics, and computer science teachers.²⁵

Skills for AI: Logic, Data Analysis, and Computer Science

Three traditional subjects can provide learners and workers with a fundamental understanding of AI: logic, data analysis (statistics), and computer science. Logic is currently not taught in schools in many countries—and is almost not taught at all in universities outside of specialised courses in computer science, philosophy, and law. This means that few students are trained to understand the fundamental role of logic in AI.²⁶ Data analysis is as fundamental as logic but is also seldom taught in schools. Most data analysis taught to non-specialists is based on classical statistics developed in the early 20th century and deals with such topics as hypothesis testing, confidence intervals, and simple optimisation methods, which present philosophical and technical problems.²⁷

Complementary Skills

AI practitioners must now be multi-disciplinary—specialised in one area such as economics, biology, or law, but also skilled in AI techniques such as machine learning (ML). In this vein, in October 2018 MIT announced the most significant change to its structure in 50 years: a new school of computing that will sit outside the engineering discipline and intertwine with all other academic departments. ‘Soft’ skills are also important: critical judgement, analysis, and interpersonal communication.²⁸ In 2021, the OECD will include a module in the Programme for International Student Assessment (PISA) to test creative and critical thinking skills.

CREATING AN ENABLING ENVIRONMENT FOR INCLUSIVE INNOVATION IN AI

Ensuring that AI Development Is Equitable Is a Growing Priority

Currently, technology, skills, data sets, and computing power are concentrated in just a few companies and nations. AI could also perpetuate biases and have a particularly unfavourable impact on vulnerable and under-represented populations.²⁹ Canada’s International Development Research Centre recently recommended the formation of a global AI for Development fund to ensure the benefits of AI are well distributed and lead to more egalitarian societies. Inclusive and sustainable AI is also an area of focus for companies such as Microsoft, as well as academic groups such as the Berkman Klein Center at Harvard University.

Long-Term Investment in Public Research Can Help Shape AI Innovation

Policymakers will need to reconsider the appropriate level of government involvement in AI research to address societal challenges.³⁰ In addition, research institutions in all areas will require capable AI systems to remain competitive, particularly in biomedical science and the life sciences, which may call for new investments. Japan, for example, invests more than \$120 million annually in high-performance computing infrastructure for universities and public research centres.

AI Will Require Greater Technology Infrastructure

Many of the existing tools to manage and use AI—such as TensorFlow (Google), Michelangelo (Uber), and Cognitive Toolkit (Microsoft)—are open-source, and some companies and researchers share curated training data sets and training tools publicly.

However, as AI projects move from concept to commercial application, specialised and expensive cloud computing and graphic-processing units are often needed. In addition, AI systems depend on extraordinary growth in computational power. The gaming software AlphaGo Zero, for example, required 300,000 times the computing power needed for the largest experiment just six years earlier.³¹

Data Access and Sharing Can Accelerate or Hinder Progress in AI

Current technologies require curated and accurate data to train and evolve. Access to high-quality data sets is critical and hinges on a number of factors, including (1) standards on interoperability, usage, access, and searchability; (2) costs of collection, access, sharing, usage, curation, storage, processing, and security; (3) commercial incentives; (4) user empowerment, including AI-powered agents; (5) trusted third parties, such as certification authorities, data-sharing platforms, and institutional review boards; (6) data representativeness that ensure data sets are inclusive and diverse; (7) risks involving confidentiality and privacy breaches, intellectual property rights (IPRs), commercial interests, and security; and (8) uncertainties about data ownership.

Possible policy approaches to enhance data access and sharing include providing access to public-sector data, facilitating data sharing in the private sector, developing statistical/data analytic capacities, and developing national data strategies.

Technical approaches are also emerging to address data constraints and shortages: deep reinforcement learning,³² transfer learning or pre-training,³³ augmented data, or data ‘synthesis’, and cryptographic advances, that let AI systems operate without collecting or accessing sensitive data.³⁴

Policy Environments for AI Innovation

Changes are clearly needed to improve the adaptability, reactivity, and versatility of policy instruments and experiments designed to foster AI and other digital innovations.³⁵ Governments can experiment with controlled environments—such as regulatory sandboxes, innovation centres, and policy labs. Governments can also encourage self-regulatory mechanisms—such as

codes of conduct, voluntary standards, and best practices—or establish and encourage public- and private-sector oversight mechanisms such as compliance reviews, audits, conformity assessments, and certification schemes.

NEXT STEPS FOR HUMAN-CENTRED AI

As AI advances and diffuses, the potential impacts of the technology's predictions, recommendations, and decisions increase. Technical, business, and policy communities are actively exploring how best to make AI human-centred and trustworthy to maximise benefits, minimise risks, and promote social acceptance.

The OECD—building on the work of the AI Group of Experts at the OECD (AIGO)—has identified key priorities for human-centred AI (The OECD AI Principles). The OECD's Principles on AI promote innovative, trustworthy AI that respects human rights and democratic values. They were adopted in May 2019 by OECD countries and partner economies, and provide the basis for the G20 AI Principles endorsed by leaders in June 2019 (see Box 1).

The OECD's AI Policy Observatory (OECD.AI) is the next major endeavour at the OECD to move from the AI principles to concrete policy action. An inclusive and multi-stakeholder hub, OECD.AI facilitates information and knowledge-sharing, provides evidence, and facilitates collaboration to promote human-centred, trustworthy AI systems.³⁶

POLICY CONCLUSIONS

AI is a general-purpose technology that is set to usher in a uniquely broad set of economic and societal changes. AI technologies are rapidly evolving and transforming economic and social sectors deeper and faster than expected. Policymakers must move quickly, and the policies they adopt must be agile and flexible, as the nature of future AI applications and their implications is hard to foresee.

Not only are AI's impacts cross-cutting, they could be exceptionally disruptive, economically and socially, in some ways that are beneficial and in other ways that are problematic. AI can improve welfare and well-being, contribute to sustainable global economic activity, increase innovation and productivity, and help respond to key global challenges. At the same time, these transformations may have disparate effects within and between societies and economies—regarding economic shifts, competition, transitions in the labour market, inequalities, and implications for democracy and human rights, privacy and data protection, and digital security.

That's why policymakers must be ready to address a broad set of policy concerns—skills development, data access, and safety in machine-based systems—and policies on privacy, research and development (R&D), infrastructure, entrepreneurship, technology diffusion, and social safety nets. This requires coordinated efforts at the highest levels, technical expertise, and understanding in government, international cooperation and knowledge-sharing, active public-private engagement, and well-developed foresight capabilities. Finally, budget allocations in a number of fields must secure the best that AI has to offer and ensure inclusive AI so that benefits are broadly shared and improve well-being for all.

BOX 1: THE OECD AI PRINCIPLES¹

The first intergovernmental standards on AI were adopted by OECD countries and partner economies in May 2019. The Recommendation of the OECD's Council on Artificial Intelligence identifies five complementary values-based principles for the responsible stewardship of trustworthy AI:

1. AI should benefit people and the planet by driving inclusive growth, sustainable development, and well-being.
2. AI systems should be designed in a way that respects the rule of law, human rights, democratic values, and diversity, and they should include appropriate safeguards—for example, enabling human intervention where necessary—to ensure a fair and just society.
3. There should be transparency and responsible disclosure around AI systems to ensure that people understand AI-based outcomes and can challenge them.
4. AI systems must function in a robust, secure, and safe way throughout their life cycles and potential risks should be continually assessed and managed.
5. Organisations and individuals developing, deploying, or operating AI systems should be held accountable for their proper functioning in line with the above principles.

Consistent with these value-based principles, the OECD also provides five recommendations to governments:

1. Facilitate public and private investment in research and development to spur innovation in trustworthy AI.
2. Foster accessible AI ecosystems with digital infrastructure, technologies, and mechanisms to share data and knowledge.
3. Ensure a policy environment that will open the way to deployment of trustworthy AI systems.
4. Empower people with the skills for AI and support workers for a fair transition.
5. Cooperate across borders and sectors to progress on responsible stewardship of trustworthy AI.

Note

1. For further information see <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449>

ENDNOTES

- 1 OECD (2017d).
- 2 Purdy & Daugherty (2016).
- 3 For more information, see <https://www.ibm.com/watson/stories/creditmutuel/>
- 4 Zeng (2018).
- 5 Lakhani & Sundaram (2017).
- 6 ITF (2017).
- 7 Dormehl (2018).
- 8 OECD (2018c).
- 9 Executive Office of the President, Government of the United States (2016).
- 10 Winick (2018), MGI (2017) & Frey & Osborne (2017).
- 11 Frey & Osborne (2017).
- 12 MGI (2017).
- 13 Nedelkoska & Quintini (2018).
- 14 OECD (2018d).
- 15 Gartner (2017).
- 16 EESC (2017).
- 17 Byhovskaya (2018).
- 18 UNI (2018).
- 19 OECD (2019b).
- 20 EOP (2016).
- 21 For further information see <https://caidg.smu.edu.sg/>
- 22 Government of the United Kingdom (2017b).
- 23 Canada (2017).
- 24 Ministry of Economic Affairs and Employment of Finland (2017).
- 25 UK (2017b).
- 26 OECD (2018c).
- 27 Ibid.
- 28 Agrawal et al. (2018b).
- 29 Smith & Neupane (2018).
- 30 OECD (2018a).
- 31 OpenAI (2018).
- 32 Among others, this technique has been used to train autonomous vehicles in doing complex manoeuvres, to train the AlphaGo programme, and to treat cancer patients—determining the smallest doses and administration frequency that still shrink brain tumours (Matheson [2018]).
- 33 Jain (2017).
- 34 Technologies such as full homomorphic encryption, in combination with neural networks, have been successfully tested and employed (Dowlin [2016]).
- 35 OECD (2018c).
- 36 See <http://www.oecd.ai>

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CHAPTER 4

Artificial Intelligence and the SDGs: Harnessing AI for Sustainable Development

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Since the term was first coined in 1956, the definition of *Artificial Intelligence* (AI) has evolved over time to refer to the theories, methods, technologies, and applications that can simulate and extend human intelligence. The aim of AI is to develop intelligent machines that can discover, contextualise, and act on data in a manner that reflects human perception and behaviour. Ideally, AI-enabled applications can augment our perception, experiences, and capacity for knowledge discovery at both a macro- and microscale.

As AI moves out of the realm of science fiction and is viewed as more of a general-purpose technology, it is set to have a broad spectrum of use and impact across industries and sectors. However, the rapid progress of innovation and the race to capture value from the technology is challenging pre-existing economic, social, and political structures.

OVERVIEW

Digital, knowledge, and resource gaps related to AI can disenfranchise non-digital natives (individuals who are generally

unfamiliar with digital technologies) from leveraging the technology to improve their quality of life. For example, according to the 2017 World Bank Global Findex Database, about 1.7 billion adults remain unbanked—that is, without access to an account or services at a financial institution.¹ A majority of the world's unbanked population lives in developing economies and tends to be concentrated among poorer households, skew disproportionately young, and have low educational attainment. AI can be used to improve digital financial services and have the most effective positive outcomes for these underserved communities. Yet they must also navigate factors such as weak digital infrastructure, inaccessible financial institutions, and lack of enough money, which can limit the efficacy of AI-enabled applications. These considerations should inform the ways AI can enable digital financial inclusion with relevant data collection and equitable access to services.

The United Nations Sustainable Development Goals (SDGs) are a critical component for leaders and experts from business, government, civil society, public policy, and science to examine

the role of AI in society. Serving as the foundation of the 2030 Agenda for Sustainable Development adopted by all United Nations member states in 2015, the SDGs are the global community's shared blueprint for benchmarking humanity's progress towards improving our quality of life and the world in which we live. Successfully executing this promise requires multi-stakeholder participation to holistically tackle these issues in a scalable manner.

AI has enormous potential for overall social good and enabling the achievement of all 17 SDGs by helping address many of humanity's most critical social issues—including those related to health, nutrition, ageing, disability, youth, employment and decent work, social inclusion, and poverty.²

In order to fully leverage AI's potential for productivity, prosperity, and peace for all, it is critical for all stakeholders, including the global talent and entrepreneurship community, to be active participants in the conversations around the application of responsible AI. To that end, the ITU's AI for Good Global Summit series,³ first held in 2017, was developed to connect problem owners, problem-solvers, and experts who are invested in developing action-oriented AI solutions to help humanity meet the SDGs. As the leading United Nations platform of the global and inclusive dialogue on AI, the AI for Good Global Summit has helped stakeholders ideate and support emerging breakthrough solutions that meaningfully address global challenges.

One such solution is the ITU/WHO Focus Group on Artificial Intelligence for Health (FG-AI4H),⁴ which was launched at the 2018 Summit. The focus group works in partnership with the World Health Organization (WHO) to establish a standardised framework for evaluating AI-based methods for health, diagnosis, triage, and treatment solutions. Since its launch, the FG-AI4H has identified several evidence-based solutions that address different dimensions of healthcare. These are carefully being evaluated in the field to improve on the metrics by which similar solutions can be measured. Taking into account the development of informed technology policy, algorithmic bias, data accountability, and adequate measures for impact are necessary steps towards the safe and ethical implementation of AI for healthcare. These advances can help us reach the SDG for good health and well-being (Goal 3) by improving the quality of healthcare for all and providing support to medical practitioners contending with growing populations and a shortage of medical talent in hospitals and healthcare institutions.

However, a significant barrier to leveraging these technological advances is that AI talent is scarce and unequally distributed across industries, sectors, and economies. To successfully harness the transformative potential of AI for sustainable development, it is critical for the global talent community to develop the right digital skills, core competencies, mindsets, and attitudes towards the technology. Bridging the skills and talent gap is necessary for our society to use AI in a way that is accountable to our values, our world, and each other.

BRIDGING THE SKILLS-TALENT GAP

The ongoing development and dispersion of AI is set to increase productivity, efficiency, and accuracy. The growth of the AI

industry will also greatly change the information technology (IT) talent landscape as it demands new sets of skills and reshapes how those skills are deployed and utilised. Training providers and academic institutions therefore need to understand these shifting skills dynamics and adjust their training to align with the demands of this increasingly AI-driven digital economy.

The importance of education and training and providing citizens with the necessary skills cannot be over-emphasised in a discussion around AI and SDGs. Digital and 21st century skills—such as AI skills—are essential to digital entrepreneurship, digital adoption, and even successful conceptualisation and implementation of digital transformation projects in both the private and public sectors. If people do not have the skills to use the digital technologies that are being put into place, there will be no impact on sustainable development.

Some of the key questions that arise from the need for new digital skills in the age of AI are: What is the impact of AI on the labour market? What are the new skills and talents that need to be acquired in the digital economy as a result of AI? What current skills will be redundant and most threatened under an AI environment? How do we address the challenges within the training and skills development sector arising from these skills needs in the labour market? How can educational institutions and training providers from both public and private spheres address these skills gaps?

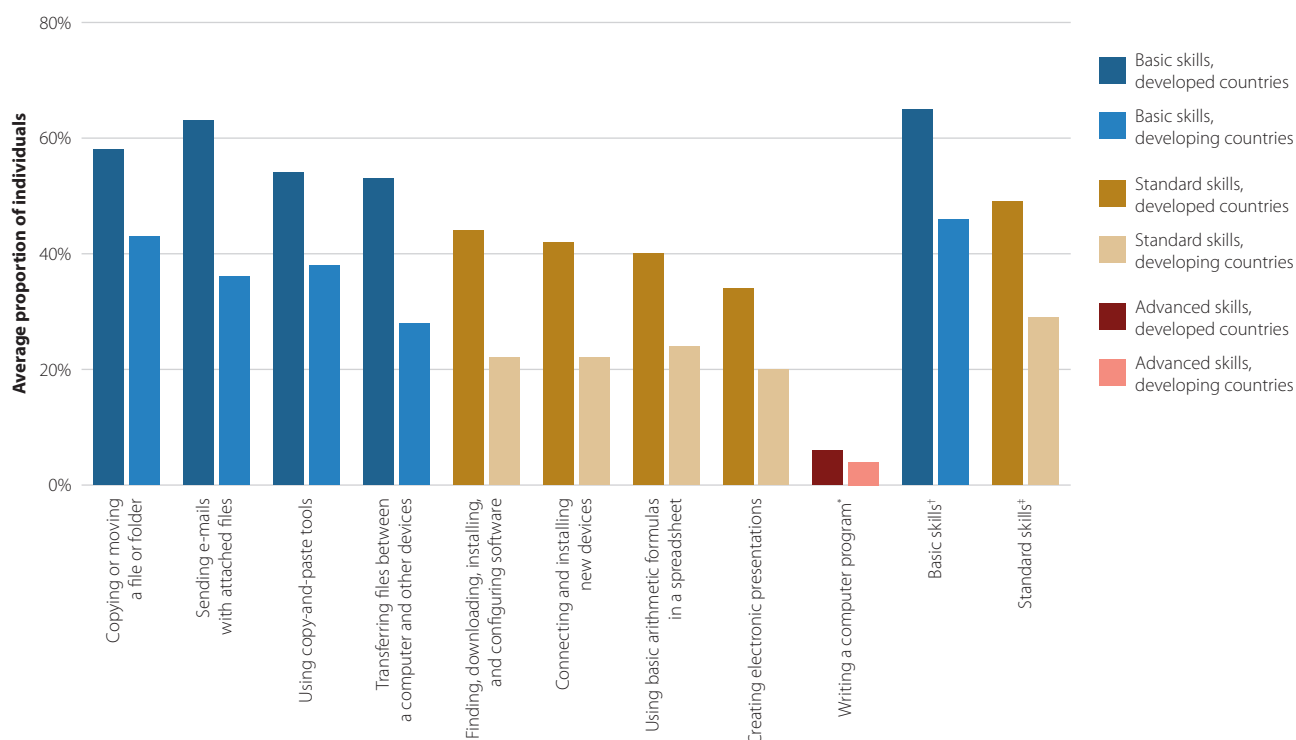
Digital Skills Gaps

ITU data and other cross-nationally comparative data sources show that in developing countries there are considerable gaps across the board when it comes to the digital skills needed at all levels (basic, standard, and advanced). As Figure 1 indicates, more than half of individuals in the developing world lack basic digital skills, such as copying files or folders or using copy and paste tools; a mere 29% have standard skills, such as installing or configuring software or using basic formulas on spreadsheets; and only 4% use specialist language to write computer programmes.

There is a lack of data collected on digital skills in developing regions, but the available data suggest that inequalities reflect other inequalities between the different regions of the world, particularly in relation to basic skills. Furthermore, ITU data also show that within-country inequalities in basic and standard skills reflect historical patterns of inequality. On average, those in employment were 10 percentage points more likely to have a skill than the self-employed, who are in turn 10 percentage points more likely than the unemployed to have a skill. Further, as Figure 2 illustrates, those with a tertiary education are approximately 1.5 to 2 times as likely to have a digital skill than those with an upper secondary education, and 3.5 to 4 times as likely as those with only a primary education. Finally, the data also indicate that individuals in rural areas are about 10 percentage points less likely than urban dwellers to have a skill, and there is a 5 percentage point difference between men and women in having a certain skill.⁵

Currently, there are huge education and skills development gaps in coverage (whether all students have access to education

Figure 1

Distribution of digital skills in developed and developing countries, 2017

Source: ITU (2018b).

Notes: Data from 52 countries (30 developed and 22 developing countries) are included. Not all countries submitted data for all skill types, and for some countries data were used from previous years because no data were available for 2017.

*Writing a computer programme is the only advanced skill measured.

†Basic skills are measured by the highest proportion on the following skills within a country: Copying or moving a file or folder; Sending e-mails with attached files; Using copy-and-paste tools; and Transferring files between a computer and other devices.

‡Standard skills are made up of the highest proportion on the following skills within a country: Finding, downloading, installing, and configuring software; Connecting and installing devices; Using basic arithmetic formulas in a spreadsheet; and Creating electronic presentations.

and skills) and quality across the developing world. Although there is growing evidence on the need to include digital skills as a core competency in education programmes at all levels and across disciplines, very few countries include topics such as computational thinking or coding skills in their secondary school curriculum, and few secondary school teachers have been trained to teach these skills.

Furthermore, employers all over the world claim they are unable to match available talent with unfilled jobs. As technology continues impacting jobs across all skill levels, all workers will need training on core skills, such as adaptability, social intelligence, communication, and problem-solving. As a basis for lifelong learning, young people will need these skills to foster creativity, imagination, and openness to new ideas.

Clearly, there is an overall mismatch between what the market is demanding and what institutions of learning—formal and informal—are providing. Schools and other training institutions are challenged to keep pace with rapid technological changes and many are stuck in old methods of instruction that are ill-suited to ways in which information and communication technologies (ICT) skills can be acquired. In addition, employers argue that the limited number of students who graduate with computer science degrees often lack job-ready skills.⁶ Modern

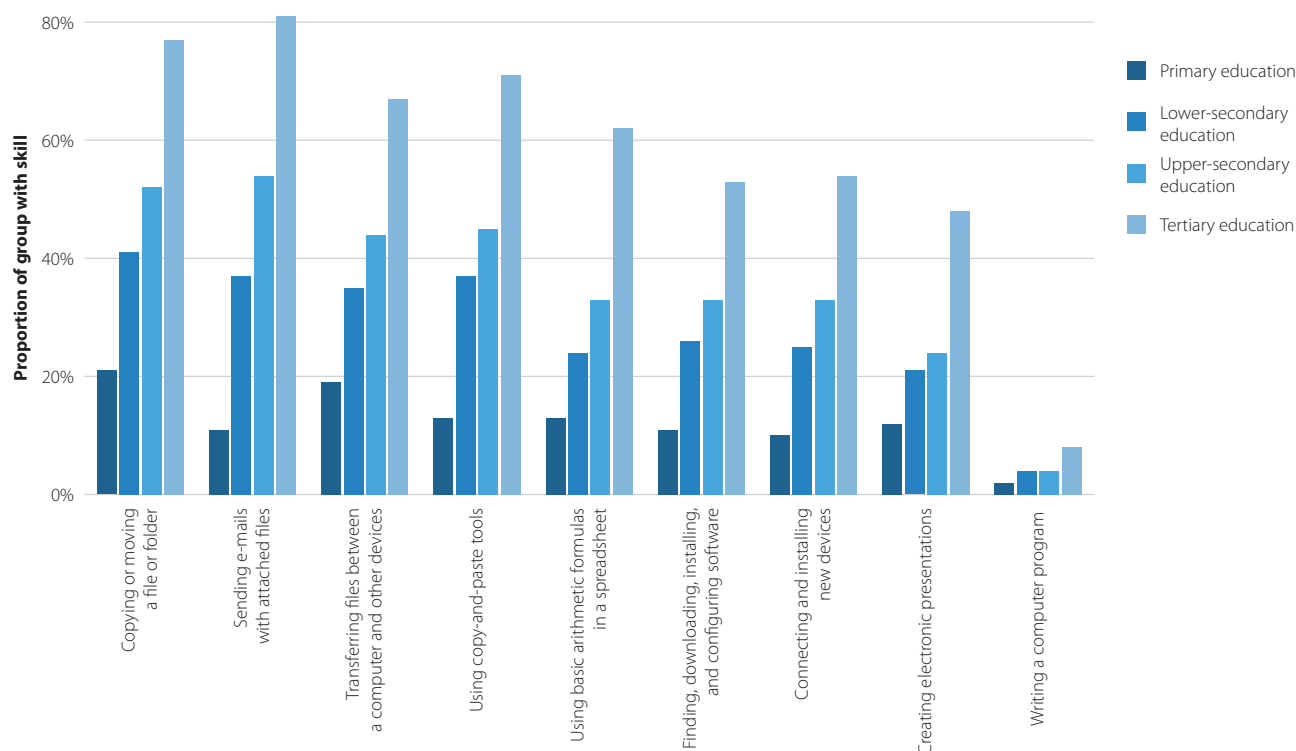
programming languages are often not a part of a university curriculum where traditional languages are taught with a focus on theory.

At the same time, many jobs of today and tomorrow require workers who are fluent in technology and are equipped with the digital skills needed to use technology on a daily basis. Key growth areas alone have created demand for tens of millions of jobs around the world. These jobs often go unfilled because of skills shortages. The lack of digital skills also shrinks the opportunities for young entrepreneurs seeking to leverage the growing digital economy and hampers their growth potential. For instance, unbanked people cannot process transactions or paychecks if they lack know-how on digital financial services.

Different levels of digital skills will open various employment pathways. Basic digital skills are generic ICT skills required for nearly all jobs. They relate to the effective use of technology, which is necessary in most professions and include web research, online communication, use of professional online platforms, and digital financial services.

The digital skills divide is widening even further in the age of AI in that some countries are making fast progress while most of the developing world is being left behind. Regardless of industry, sector, or job type, AI technologies will significantly impact the

Figure 2
Level of education and digital skills, 2017



Source: ITU (2018b).

Notes: Thirty-seven countries provided data on skills for different education level groups. Not all countries submitted data for all skill types, and for some countries data from previous years were used because no data were available for 2017. Proportions are based on country averages for individuals with a certain education level that have that skill.

labour market and the skills required by different industries and sectors. Re-skilling and up-skilling is already taking place in many sectors and this needs to be complemented by adult learning programmes and other professional training.

ITU research has shown that a widening gap may also unfold at the level of individual workers. Demand for jobs could shift away from repetitive tasks towards those that are socially and cognitively driven and others that involve activities that are hard to automate and require more digital skills. Job profiles characterised by repetitive tasks and activities that require low digital skills may experience the largest decline as a share of total employment, from some 40% to near 30% by 2030. The largest gain in share may be in non-repetitive activities and those that require high digital skills, rising from some 40% to more than 50%. These shifts in employment will undoubtedly have an impact on wages. ITU research has shown that around 13% of the total wage bill could shift to categories requiring non-repetitive and high digital skills, where incomes could rise, while workers in the repetitive and low digital skills categories may potentially experience stagnation or even a cut in their wages.⁷

Gender imbalances are also a challenge. It is estimated that women represent just 7.6% of software developers,⁸ and only 15% of ICT patents are filed by women.⁹

The Skills coalition of EQUALS, The Global Partnership for Gender Equality in the Digital Age, released a report that is calling for the need for policymakers to address gender bias in AI;

teams developing AI technology must commit to greater gender equality—in hiring, training, and advancement.¹⁰

What Needs to Be Done

In order to address these many challenges related to the mismatch between skills demand and supply, many countries and development organisations are now focusing strongly on strengthening digital skills, including in the context of sustainable development and the achievement of the SDGs.

Digital skills strategy frameworks need to be part of any national digital policy. In this context, it is essential to make effective digital skills policies that address gaps in the labour market and concerns about widening social inequalities. This can be done by (1) collecting higher-quality and more reliable data on the full range of digital skills in different sectors; (2) targeting specific groups depending on need and outcomes to be achieved, rather than following a one-size-fits-all approach; and (3) stimulating multisectoral stakeholder partnerships with a continuous exchange of lessons learned and improvements made.¹¹

Closing the skills gap will require having a solid understanding of the existing skills base and the skills needed to thrive in the digital environments that include AI technology applications of the future. National skills assessments should be carried out in order to make informed decisions on national digital skills strategies, projects, and initiatives.

Developing capacities in the field of telecommunication and digital technologies is one of the core mandates of the ITU, in particular through its Development Sector. The ITU Academy, the flagship initiative that integrates all of ITU's capacity development activities under one umbrella, was established to assist countries to develop capacities on emerging technology topics of priority to them.¹² Through the ITU Academy, ITU organises and delivers training through various channels, in particular the ITU network of Centres of Excellence.

The year 2019 marked the beginning of a new four-year cycle of the ITU Centres of Excellence network. Twenty-nine centres were selected across six regions to provide training in 15 priority areas, including: artificial intelligence, big data, the internet of things, broadband, cybersecurity, spectrum management, the digital economy and smart cities and communities, and others.¹³

As a member-driven organisation, ITU works in close collaboration with a variety of stakeholders—from governments to the private sector, academia, and international agencies—to address the challenges in capacity and skills development in the digital age.

In 2017, the International Labour Organization (ILO) and ITU launched the Digital Skills for Jobs Campaign to equip young people with job-ready digital skills and connect them to job opportunities.¹⁴ The campaign seeks to advance the objective of the ILO Global Initiative on Decent Jobs for Youth, which has as its mission to scale up action and impact on youth employment at country and regional levels.¹⁵ Decent Jobs for Youth is the first United Nations system-wide effort for the promotion of youth employment worldwide. It represents a unique collaboration platform to join hands—within and beyond the UN system—to tackle the youth employment challenge and assist UN member states in targeting a crucial goal of the 2030 Agenda for Sustainable Development.

The goal of the ITU-ILO Digital Skills for Jobs Campaign is to mobilise investments from a range of stakeholders to equip 5 million youths with job-ready digital skills globally by 2030. This ambitious goal will be achieved by forging action-oriented partnerships to extend and optimise digital investments for young people in the education system and on the job, across sectors and within and between countries. Recognising that there is more to achieving decent jobs than enhancing and accumulating skills, the campaign invites job creators in the public and private sectors to realise the potential of the ICT and other digitally driven sectors to employ youth with decent jobs and foster an enabling environment for sustainable digital entrepreneurship.

CONCLUSION

AI technologies and applications are rapidly transforming society—bringing with them not only unprecedented opportunities for driving sustainable development but also profound challenges. With the potential to accelerate progress in line with each and every one of the SDGs, AI holds great promise to deliver digital dividends for people everywhere, but also significant implications of risk for widening digital divides in many different facets, including the availability of skills and talent.

This leads to the question: Are new ways of working together needed to harness the potential of AI for good? And if so, who should be involved?

One of the key issues with AI technologies and its applications is that their development, access, and impacts are unevenly distributed, both in terms of the pace of change as well as the geographies and demographics of where those impacts are realised. Operating in different cultural, social, economic, and political contexts requires tailored policies and actions that have the potential to dramatically shape the ways in which the impacts from AI's development and deployment will be felt. However, the technological changes driven by these initiatives are rarely restricted to a local or sectoral impact; they cut uniquely across international boundaries, policy silos, and professional domains.

Given the scale, spread, and speed of this change, therefore, divergent approaches and ad-hoc responses will not suffice. Cooperation across domains and across borders is going to be critical to realise the full socioeconomic potential of AI technologies, as well as for mitigating the risks they pose and curtailing any unintended consequences. Effective cooperation for sustainable growth and innovation will also require universal grounding in common human values—such as inclusiveness, respect, human-centredness, human rights, transparency, and sustainability.

This is particularly critical when addressing the issue of human capacity building—including education and re-skilling—for AI. Multi-stakeholder cooperation is essential to tackle AI in an ambitious and holistic manner and to promote its use for the implementation of the SDGs. Concerted effort and frameworks will be required to directly support economic and social inclusion; ensure that traditionally marginalised groups (such as women, youth, indigenous people, rural populations, and older people) are empowered; strengthen multi-stakeholder partnerships on capacity building; encourage governments to take evidence-based action; make investments in both human capital and infrastructure; address environmental concerns; develop smart regulatory environments; and assist those facing disruption from the impact of AI on their livelihoods.

Society is at a critical point in understanding AI, and how we—collectively—approach this process will affect the human impact of AI-based applications. It is essential, therefore, that current and future generations are equipped with the tools necessary to harness AI for sustainable development and to build an innovation ecosystem that fosters the development of an ethical and human-centered technology.

ENDNOTES

- 1 World Bank Group (2017).
- 2 ITU (2017).
- 3 Further information about the AI for Good Global Summit series is available at <https://aiforgood.itu.int/>
- 4 ITU/World Health Organization (2018).
- 5 ITU (2018b).
- 6 ITU (2014).
- 7 ITU (2018a).

- 8 Stacks Overflow (2017).
- 9 Jensen, et al. (2018).
- 10 Further information about EQUALS is available at <https://www.equals.org/>
- 11 ITU (2018b).
- 12 See <https://academy.itu.int/home> for more information on the ITU Academy.
- 13 ITU (2014).
- 14 For more on the Digital Skills for Jobs Campaign, see <https://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Digital-Skills.aspx>
- 15 More details on the ILO's Global Initiative on Decent Jobs for Youth is available here: <https://www.ilo.org/global/topics/youth-employment/databases-platforms/global-initiative-decent-jobs/lang--en/index.htm>

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CHAPTER 5

New Skills for Augmenting Jobs and Enhancing Performance with AI

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INSEAD

From the replacement of physical work by machines to the support of business processes and decisions using information technology (IT), technology has increasingly been transforming jobs—and in the process economies and societies. Unlike many previous technologies, Artificial Intelligence (AI) promises to further transform jobs that rely on what has always been considered an ability only humans, and not machines, have: judgment and decision-making. While many technologies have supported decision-making, or automated simple decision-making, AI has the capability to automate ('make') *increasingly complex* decisions for people and professionals from all walks of life: from financial investments to medical diagnoses and treatments, to procurement and sales, to legal and strategic decisions, among others.

Although such technological capabilities might create fears of job losses, they also create enormous opportunities to augment jobs and improve job performance. While a lot has been said about technological *substitution* of jobs, we will focus in this chapter on what we believe is a far bigger opportunity: job

augmentation using AI. However, to achieve these promises, we will need new skills and possibly transform our education and lifelong training systems. What are the main skill gaps we need to fill in the coming years? What new skills do managers and executives need to best leverage the opportunities AI enables for their jobs and organisations while minimising potential new risks? How should education evolve to better prepare the future workforce as AI and other technologies transform jobs? What are the implications of AI for professional jobs, particularly in the healthcare and legal professions? We will close with summaries of how two educational institutions, MIT and INSEAD, have responded so far to the rising needs for new skills.

NEW SKILLS FOR ORGANISATIONS

After almost half a century of growing investments in enterprise IT—from mainframes to enterprise resource planning (ERP) software, to internet technologies, to customer relationship management (CRM) and other knowledge and relationship management systems—we know that unless investments in

technology are coupled with necessary organisational changes, the productivity benefits of technology cannot be fully achieved. Decades-long research is conclusive on this point.¹ A key dimension of organisational change has always been training and developing new skills and roles. As the latest and potentially most transformative of information technologies, AI will follow the same pattern—and possibly require even more resources to successfully prepare the workforce.

Consider a very diverse, holistic set of skills . . . in the labour pool.

Given the unique decision-making capabilities, technological complexity, and potential impact of AI, it is necessary to consider a very diverse and holistic set of skills that organisations need to look for in the labour pool/among workers in order to facilitate AI's adoption and maintain a positive impact while managing any new risks that can result. These skills range from engineering and statistical capabilities to an understanding of management, philosophical, and ethical principles. They are necessary at all levels throughout an organisation, although the relative balance may differ depending on specific jobs and roles. While seniority may not be an accurate dimension to differentiate jobs, it is a factor in the analysis here as a way to discuss possible differences in the balance of skills for different roles. Such an analysis may also help organisations better manage how to best integrate a new generation of graduates—many from recently developed university-level programmes in data science or machine learning—with current senior management teams that may have been trained in very different paradigms. Indeed, one of the most common challenges and questions voiced by senior executives and directors of boards is simply 'What do I need to know to better position myself and my organisation in the AI era?'

Skills for the Middle Manager

Organisations have been increasingly turning to analytics and AI to improve decision-making across business processes—from research and design to supply chain and risk management. Certainly, **data scientists** are required to build the analytics models, often with machine learning and deep learning, that are capable of turning vast amounts of data into insights. They also need to be supported by other new roles such as **data engineers**, **data architects**, and **data visualization experts**. More recently, however, companies have recognized that aligning AI with business requires new hybrid roles—what are often called **translators**.² Translators play an increasingly important role for the success of AI in an organisation as they facilitate the sourcing,

development, and retention of necessary talent, such as data scientists. They possess domain knowledge, understanding of business needs to prioritise decisions and guide analytics teams, and understanding of AI in order to better communicate business needs to data professionals. In fact, the McKinsey Global Institute (2016) estimates that by 2026 demand for translators in the United States alone may reach 2–4 million.³ While these roles may be new, experience with what makes translators successful provides insights on what skills middle managers generally need.

Henke et al. (2018) suggest that the wide range of responsibilities—leader, communicator, project manager, industry expert—inherent in the translator's role makes the following four skills essential.⁴ These are the key skills middle managers need to focus on—and all are necessary if they are to be involved in or make decisions about AI initiatives:

- *Domain knowledge.* Understanding the context where analytics and AI will be applied is perhaps the most crucial skill—in particular, an understanding of key operational metrics and their financial implications so that AI is applied in the most impactful ways. Business process expertise is also necessary to identify how AI can best optimise processes and decisions, and eventually create value for an organisation.
- *General technical fluency.* Translators need to also have strong acumen in analytics and structured problem-solving, ideally with a science, technology, engineering, and mathematics (STEM) background. And while they do not need to be able to build analytics models, they do need to understand the types of models that are available and the business problems they can be applied to. Finally, interpreting solutions in the business context and understanding the limitations of the models is an important skill. Having some programming skills can enable middle managers to fully leverage AI capabilities; for example, by allowing easier experimentation, prototyping, analysis, and fast learning of how to best apply AI in a given business case.
- *AI project management skills.* Translators should be able to lead an analytics project from the idea phase through execution and, finally, to adoption. AI projects share characteristics with basic IT projects as well as with fundamental concepts of innovation and entrepreneurship. As such, middle managers need to understand the importance of fast, iterative development and experimentation, as well as the fact that once AI is developed it needs to be continuously monitored for it is always evolving, and can make any recently adopted AI technology obsolete.
- *Entrepreneurial spirit.* A can-do attitude and a willingness to explore ideas and problems that have not yet been explored is also important. This behaviour is often not taught, but a company's culture can nurture and affect its development. Given the endless innovation opportunities

AI can enable, translators also require not only good process management aptitude, but also creativity, out-of-the-box thinking, and a willingness to take risks and pivot as needed.

Given the urgent need for people with such a combination of skills, hiring externally might seem the quickest solution. However, new hires frequently lack the most important quality: deep organisational knowledge. As a result, training existing employees for new AI-enabled roles often proves to be the best option. This can be achieved through programmes such as Masters in Business Analytics, MBA programmes that embrace analytics and AI, or executive education opportunities (which often include some online education options).

Senior executives . . . ask 'What do I need to know to better position myself and my organisation in the AI era?'

What Skills do the C-Suites Need?

Senior managers, executives, and board directors often find themselves perplexed by how to keep up with the accelerating pace of technological progress, or by how to best leverage these new developments while minimising potential new risks and liabilities. They typically ask, 'What can we do in our organisation to improve our AI capabilities and manage risks?' or, on a more personal level, 'What do I need to learn to do my job as a leader better?'

Given the growing pervasiveness of AI/Machine Learning (ML)/Data Science (DS) in college education and early career stages, future senior managers will be forced to become increasingly experienced with the more technical aspects of AI/ML over time. In the short term, today's senior managers may need to rely on translators for more technical-related business decisions. However, in order to make better decisions regarding resource allocation, investments in AI technologies, and talent retention at all levels of their organisation, it is important that senior managers and executives have some appreciation of the issues, concepts, capabilities, and limitations of these technologies. For top executives, the following skills are essential to better manage business opportunities and risks related to AI development and innovation:

- *Understanding the 'art of the possible'* to continuously assess the transformational impact of AI and the opportunities it

enables. Such opportunities may exist at different levels: from optimising specific business processes and enhancing decision-making to developing new products and services or enhancing existing ones, to transforming business models or making current ones obsolete (much like major technological innovations have done in the past). Executives must also understand how AI might transform their industry in the mid- and long term in order to make appropriate strategic decisions. However, it is important to balance hype with reality; this requires a broad understanding of how AI works, its capabilities, as well as its limitations.

- *Managing new AI-driven business risks* to gain a firm understanding of the risks associated with ML and AI. Unlike other technologies, AI has the ability to make increasingly complex decisions. However, with advanced decision-making comes liability, which machines do not have. In essence, machines decide while humans bear all risks. Executives need to manage new AI risks such as unfair, biased, and possibly discriminatory decisions their AI-embedded products or services may make; financial losses when faulty resource-allocation decisions are made or driven by computers; and even health-related risks that AI-embedded medical devices or autonomous devices and vehicles may give rise to. Organisations may need to develop processes to *audit* their AI products and services—such as AI ethics governance committees—and ways to monitor the behaviour of all AI they develop.

One option for executives is to learn the process of **red teaming**—the practice of rigorously challenging plans, policies, systems, and assumptions by adopting an adversarial approach—to prevent or minimise all possible risks, such as financial risk, data risk, software/algorithm risk, third-party integration risk, intellectual property (IP) risk, and legal risk. They then seek to leverage data to quantify the knowable risks and monitor the unknowable ones.

- *Understanding regulatory changes, as well as the social and macro/political impact of AI.* It is increasingly clear that AI can transform the social fabric and even affect the balance of power across geographies. Organisations such as the Organisation for Economic Co-operation and Development (OECD) have already drafted principles that governments and—eventually—businesses may need to follow when pursuing their AI strategies.⁵ The IEEE Standards Association is developing processes for certifying AI products and services;⁶ and regulators have created regulatory frameworks for approving AI products—such as medical devices in the case of the United States Food and Drug Administration (FDA). Executives and directors need to consider and contribute to the development of such principles, standards, and regulations as those will affect not only their business and industry, but society overall.

How can executives and directors stay up-to-date with the necessary knowledge and skills? While there is an abundance of reports on the business implications of AI, developing a broader view of technology trends and their macro impacts requires awareness not only of business but also of technological and scientific innovations. Executive training programmes, in-house events with external experts and workshops, partnerships with technology companies, and involvement of advisors who have a deep understanding of both technology and business can provide a more focused complement to the broad-based knowledge.

HIGHER EDUCATION FOR THE FUTURE AI WORKFORCE

Given the need for the skills outlined above, how should higher education systems evolve to better prepare the future workforce? At the university level, training should cover both skills that are drastically different as well as skills that are structurally similar to those of the past few decades. These drastically different skills might include:

- *The definition of foundational knowledge.* In the majority of higher education institutions today, basic calculus and physics courses are obligatory. It is now expected that introductory AI/ML/DS courses will be added as obligatory for all majors—possibly replacing the requirements of calculus and physics that exist today. These introductory courses would, ideally, span a wide range of areas of knowledge, including the humanities and the law, where, for example, natural language processing can improve our understanding of comparative literature and contracts, respectively; medicine, where electronic medical records, images, reports, and genomic information processed via AI/ML/DS can materially improve outcomes for patients; as well as science and engineering disciplines. To encourage the development of this type of coursework, MIT announced the Stephen A. Schwarzman College of Computing as a bold initiative to accelerate pioneering research and innovation in computing, build a profound awareness of the ethical implications and societal impact of advanced technologies such as AI, and, above all, educate leaders for the algorithmic future.
- *Communicating with data and ethical AI.* The art of communication, both orally and in writing, has always been central in education. What is new is the need to develop an ability to communicate with *data* effectively. In addition, AI often masks systematic biases, like giving priority to people of a particular gender or race in college admissions or medical treatments. This necessitates the need to expose students to interpretable AI, and to introduce ethics and related philosophical topics involving AI into the classroom as early as possible.
- *Conceptually defining a problem statement.* Students must learn to assess an ambiguous situation, conceptually define the problem, and outline a structure to solve the problem. The mechanism to teach this has existed for centuries and well-designed mathematics, science, and engineering courses cover it. What is new is the need to collaborate using technology. Curriculum designers should consider including not only group technical assignments, but also—and equally important—up-front scoping and communication as a monitored and assessed activity.
- *Using computational software to derive an answer.* While the acquisition of this skill is well established in a university curriculum, there are, however, two aspects that are new:
 - » Students must become adept at *scanning the technological environment for new data sources*. With the rise of publicly available application programming interfaces (APIs), there is more data and more opportunity for creativity.
 - » Students must not assume that they have to build a model from scratch, but rather gain the skills to search existing open-source software libraries (e.g., R / Python) for solutions, as well as search crowd-sourced platforms for answers (e.g., the internet, Github, and Stack Overflow).
- *Acquiring depth in a given coding language.* This will ensure that a student not only understands the limits and capabilities of software, but also understands the ‘art of learning’. Proficiency in a given coding language demonstrates that a student has learned to leverage existing code libraries and open-source resources to reuse code and methodologies. The point is in both the actual coding as well as the learning process: Software languages will come and go, but coding processes and techniques will remain the same.

NEW JOB OPPORTUNITIES FOR PROFESSIONALS: SOME EXAMPLES

Advances in AI open exciting new opportunities to enhance numerous professional jobs and roles across different sectors. For example, with the availability of electronic data records, imaging data, radiology reports, doctor notes, and genomic information there is great opportunity to more accurately diagnose diseases and personalise treatments based on AI and the available data. Bertsimas et al. (2018) have developed a calculator (POTTER) that is designed to assess the probability of mortality and morbidity for emergency care patients based on electronic medical records.⁷ The calculator is currently in use at the Massachusetts General Hospital (MGH). In addition, early detection of breast cancer based on images using deep learning has become stronger than human detection by radiologists and is also currently in use at the MGH. In medical education, new curricula are

Structurally similar skills include:

expected to be developed that involve the use of AI in medicine, introducing healthcare professionals to these technologies early on. For example, a class on Machine Learning in Health Care will be offered at MIT in the academic year 2020–2021.

Educational institutions may need to develop new and deeper connections across disciplines.

There are also substantial opportunities in the legal profession. As noted earlier in this chapter, contracts often involve hundreds of pages, and natural language processing can be used to check several aspects of contracts and generate initial versions given specific characteristics. Success in this direction could introduce new teaching opportunities in law schools—for example, incorporating/adopting relevant AI tools in courses and exposing future legal professionals to the capabilities and limitations of AI technologies more broadly. Data and machine learning can also be used to support decision-making. For example, recent work shows how AI may be able to predict as well as human judges whether defendants may recommit crimes if released, providing important input to the judges' decision-making.⁸ It seems clear from these examples that AI could be a valuable collaborator—especially when it comes to decision-making—and that learning to work with AI may prove to be a key skill across the legal profession.

ADDRESSING THE SKILLS NEEDS: EXAMPLES FROM MIT AND INSEAD

How should higher education institutions—from colleges to business schools—adapt to support the development of both the current and future workforces? The need to provide training that spans the wide range of necessary skills outlined earlier in this chapter demonstrates that these educational institutions may need to develop new and deeper connections across disciplines—including analytical and technical training in fields that have not traditionally encompassed such training—and to develop new courses and also possibly new programmes and degrees. Described below are some initiatives that have recently been adopted to attempt to fulfill these new needs.

The MIT Way

In 2016, MIT Sloan School of Management created a 12-month Master of Business Analytics (MBAn) programme that prepares students for careers that apply and manage modern data science to solve critical business challenges. Established in conjunction with MIT's Operations Research Center—an interdisciplinary

research center established in 1953—the MBAn programme is for current students or recent graduates who plan to pursue a career in the data science industry, as well as those seeking career advancement or change, especially engineers, mathematicians, physicists, computer programmers, and other high-tech professionals.⁹ Graduates of the programme have joined consulting, healthcare, technology, and start-up companies as well as data science groups of more traditional industries, often commanding salaries at par with MBA graduates, who are typically six years older. The Sloan School also offers a Business Analytics Certificate to address the increasing demand for professionals who want to understand business analytics either as a data scientist or as an analytics translator.¹⁰ Typically, about one-third of the school's entire student body elects to earn this certificate. Finally, a massive open online course (MOOC) non-degree course, The Analytics Edge, offered annually since 2013, has been attracting tens of thousands of students every year,¹¹ and a new undergraduate major in Business Analytics was established in 2017.¹²

In addition, the MIT Stephen A. Schwarzman College of Computing, launched in September 2019 and mentioned earlier in this chapter, is designed to accelerate pioneering research and innovation in computing, build a profound awareness of the ethical implications and societal impact of new computing technologies, and, above all, educate leaders for the algorithmic future. For nearly 70 years, MIT has been comprised of five schools: Engineering, Science, Management, Urban Studies, and Humanities. This new college is a new structure that connects with the traditional five schools, emphasising the concept/approach that today's students must be educated in AI/ML/DS as these new and evolving technologies will affect all aspects of human knowledge.

The Case for a Global Business School: INSEAD

INSEAD has followed a more incremental approach to integrating AI-related topics into its educational programmes. While no Business Analytics degree has yet been launched, a number of analytics courses have been incorporated into MBA and Executive MBA curricula in recent years, covering skills ranging from understanding machine learning tools to managing data science projects, using analytics and AI for business process optimisation, and understanding the impact of AI on organisations and industries as well as what it means for business strategy. Some of these courses are designed to develop general skills for managing data science projects, while others combine analytics with specific business topics such as supply chain, marketing, or human resources. While there are no pure coding courses, programming has been introduced as a component of some courses. In fact, INSEAD has been an early adopter of programming coursework among business schools. However, the focus is on combining data analytics and AI with business training—for example, how these technologies can be used to optimise business processes. In addition, INSEAD is launching a new Master in Management programme that will have significantly more focus on how to apply AI and data science to business problems, as well as programming courses.

The Executive Education programme, AI for Business launched in 2019, is designed to give managers an understanding of what AI can and cannot do for their organisation. It also provides templates to guide managers and executives on how to identify AI business opportunities, manage AI projects, and work with data scientists in their organisations. Other executive programmes have also started incorporating AI into the topics and areas of study that they cover. For example, a popular five-week online course, *Strategies for an Age of Digital Disruption*, added an AI track with weekly supplemental lectures and a specialised action learning project for AI.

Finally, INSEAD has developed partnerships with other organisations to complement its AI training offerings and expand its reach. For example, a partnership with Microsoft, the AI Business School,¹³ features a series of online sessions covering topics ranging from how to define an AI strategy to developing principles and governance processes for responsible AI. In the summer of 2019, INSEAD also initiated a partnership with Singularity University to develop joint executive training programmes globally; the first such offering is *The Future of AI: Seizing the Opportunity*.¹⁴

CONCLUSION

Unlike other technologies, AI has the ability to not just support decision-making but actually make decisions. This capability creates new opportunities to transform jobs by *augmenting* them, not necessarily replacing them. Given how human-like AI can be—organisations may wish to consider that they are ‘hiring’ AI rather than ‘buying’ AI—understanding its impact on organisations and jobs, and leveraging the positive transformative potential of AI while also minimising its risks, requires a very diverse and holistic set of skills. The skills highlighted in this chapter differ across roles within organisations, whether at the middle manager, executive, or director level. While the mix of skills may differ, one thing is increasingly clear: succeeding in the AI era requires not only an understanding of how this technology can affect business, but also an awareness of its capabilities and limitations and of the potential for new technical training for many jobs including professional ones, and, as important, a broader understanding of how AI may affect societies. In order to successfully accomplish this, a diverse set of skills spanning technical, business, ethical, and broadly philosophical topics are necessary.

ENDNOTES

- 1 Brynjolfsson & Hitt (2000).
- 2 Henke et al. (2018).
- 3 McKinsey Global Institute (2016).
- 4 Henke et al. (2018).
- 5 OECD (2019).
- 6 IEEE Standards Association (2019).
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- 11 For further details see <https://ocw.mit.edu/courses/sloan-school-of-management/15-071-the-analytics-edge-spring-2017/>
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CHAPTER 6

JRC Statistical Audit of the Global Talent Competitiveness Index 2020

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Individual skills and talents, more than capital, are the driving forces that guide human beings towards the future. Since 2013, the business school INSEAD has developed the Global Talent Competitiveness Index (GTCI), which aims to summarise complex and versatile concepts related to human capital and talent competitiveness at the national scale worldwide. In so doing, it raises conceptual and practical challenges, which are discussed in the GTCI 2020 report. This chapter focuses on the practical challenges related to the data quality and the methodological choices made in the grouping of 70 variables into 14 sub-pillars, six pillars, two sub-indices, and an overall index for 132 countries.

The GTCI 2020 has a very high statistical reliability (it has a Cronbach's alpha value of 0.97) and captures the single latent phenomenon underlying the six main dimensions of the GTCI conceptual framework. Country ranks are also robust to methodological choices related to the treatment of missing values, weighting, and aggregation rule (with a shift less than or equal to ± 2 positions with respect to the simulated median in 90% of

the countries). The added value of the GTCI lies in its ability to summarise different aspects of talent competitiveness in a more efficient and parsimonious manner than is possible with the variables and pillars taken separately. In fact, the overall ranking differs from any of the six pillar rankings by 10 positions or more in at least 30% of the countries included in this year's GTCI.

The European Commission's Competence Centre on Composite Indicators and Scoreboards at the Joint Research Centre (JRC) has been invited to assess the statistical properties of the GTCI each year since its first release in 2013. Thus this audit represents the seventh analysis of the GTCI performed by the JRC. Overall, the JRC concluded that the GTCI 2020 is robust and reliable, with a statistically coherent and balanced multi-level structure. The analysis has been performed in order to ensure the transparency and reliability of the GTCI and thus to enable policymakers to derive more accurate and meaningful conclusions about human capital and national competitiveness, and potentially to guide their choices on priority setting and policy formulation.

As in the previous audits, the present JRC assessment of the GTCI 2020 focuses on two main issues: (1) the statistical coherence of the structure and (2) the impact of key modelling assumptions on the GTCI scores and ranks.¹ The JRC analysis complements the reported country rankings for the GTCI, and for the Input and Output sub-indices, with confidence intervals in order to better appreciate the robustness of these ranks to the computation methodology (in particular, the missing data estimation, weights, and aggregation formula). Furthermore, the JRC analysis includes an assessment of the added value of the GTCI and a comparison with other global measures of human capital, competitiveness, and innovation. The version of the GTCI model presented in 2020 has many aspects in common with these other global measures. Nevertheless, compared with the other indices, the GTCI 2020 is proven to offer additional insights into nations' human capital and competitiveness.

The practical items addressed in this chapter relate to the statistical soundness of the GTCI, which should be considered to be a necessary (though not necessarily sufficient) condition for a sound index. Given that the present statistical analysis of the GTCI will mostly, though not exclusively, be based on correlations, the correspondence of the GTCI to a real-world phenomenon needs to be critically addressed because *'correlations do not necessarily represent the real influence of the individual indicators on the phenomenon being measured'*.² The point is that the validity of the GTCI relies on the combination of both statistical and conceptual soundness. In this respect, the GTCI has been developed following an iterative process that went back and forth between the theoretical understanding of human capital and talent competitiveness on the one hand, and empirical observations on the other.

STATISTICAL COHERENCE IN THE GTCI FRAMEWORK

The JRC undertook an initial assessment of the GTCI 2020 data set in September 2019. The latest GTCI model provided by the development team largely incorporated the issues identified and discussed in previous editions—in particular, the substitution of variables previously determined to be not influential on the final values of the index. No critical issues were identified in the 2020 model during this preliminary phase of the audit.

The underlying concepts and framework used to describe global talent competitiveness in the GTCI 2020 have remained essentially the same as those in the GTCI 2019, although there are some minor adjustments in this year's edition. Three variables have been excluded from the framework in the 2020 edition: Ease of hiring and Ease of redundancy (1.3.1 and 1.3.2) and Gender earnings gap (2.2.5).

On the other hand, six new variables have been included: Urban population (1.2.6), Tertiary-educated unemployment (1.3.1), and the Gender development gap (2.2.5) are inserted as an update of the excluded variables, and Rule of law (1.1.2) is an external index included in the Regulatory Landscape sub-pillar. Furthermore, Investment in emerging technologies (1.3.7) and Robot density (1.3.8) are used to form a new component, called *Technology Adoption*, of sub-pillar Business and Labour

Landscape (1.3), which also contains Technology utilisation (moved from 1.2.6 last year to 1.3.6).

Following the iterative process during which the index has been fine-tuned, the current assessment of the statistical coherence in this final version of the GTCI 2020 followed four steps:

Step 1: Relevance

Variables were selected for their relevance to a specific pillar on the basis of the literature review, expert opinion, country coverage, and timeliness. To represent a fair picture of country differences, variables were scaled either at the source or by the GTCI team as appropriate and where needed.

Step 2: Data Checks

The data used are the most recently released. The cut-off year was set to 2008. Countries were included if data availability was at least 80% at the index level and at least 40% at the sub-pillar level. As a result, the GTCI 2020 data set comprises 132 countries and 70 variables.³ Consequently, data availability is at least 84% at the Input sub-index level and 63% at the Output sub-index level. Potentially problematic variables that could bias the overall results were identified by the GTCI development team as those having absolute skewness greater than 2 and kurtosis greater than 3.5,⁴ and were treated either by winsorisation or by taking the natural logarithm (in the case of five or more outliers). In total, six indicators were treated: 1.3.8 Robot density, 2.1.3 Migrant stock, 2.1.4 International students, 2.2.5 Gender development gap, 6.1.5 Senior officials and managers, and 6.2.2 High-value exports (see Appendix I, Technical Notes, for details). In the case of Robot density, a larger share of missing data is observed. This variable is one of this year's new ones, so an improvement in its coverage in the next edition can be expected. These criteria follow the WIPO-INSEAD Global Innovation Index practice (formulated with the JRC in 2011). The variable Rule of law (1.1.2) is highly correlated with three out of four of the other variables of the Regulatory Landscape sub-pillar; this is not a critical issue, but the elimination of one of these variables should not damage the structure of the sub-pillar.

Step 3: Statistical Coherence

This section presents the JRC's analysis of the statistical coherence of the GTCI 2020, which consists of a principal component analysis to study the structure of the data, a multi-level analysis of the correlations of variables, and a comparison of GTCI rankings with its pillars and with other similar indices. This latter investigation demonstrates the added value of the GTCI both against its component pillars and vis-à-vis other relevant indices on competitiveness, innovation, and human capital.

1. Principal Component Analysis and Reliability Item Analysis

Principal component analysis (PCA) was used to assess the extent to which the conceptual framework is compatible with statistical properties of the data. PCA confirms the presence of a single statistical dimension (i.e., no more than one principal component with an eigenvalue significantly greater than 1.0)

Table 1

Statistical coherence in the GTCI: Correlations between sub-pillars and pillars

	SUB-PILLAR	ENABLE	ATTRACT	GROW	RETAIN	VOCATIONAL AND TECHNICAL SKILLS	GLOBAL KNOWLEDGE SKILLS
INPUT	1.1 Regulatory Landscape	0.95	0.85	0.87	0.89	0.84	0.83
	1.2 Market Landscape	0.95	0.77	0.89	0.92	0.88	0.87
	1.3 Business and Labour Landscape	0.93	0.85	0.86	0.80	0.84	0.77
	2.1 External Openness	0.81	0.93	0.72	0.68	0.70	0.64
	2.2 Internal Openness	0.80	0.90	0.76	0.75	0.74	0.65
	3.1 Formal Education	0.77	0.55	0.88	0.82	0.74	0.84
	3.2 Lifelong Learning	0.86	0.81	0.94	0.78	0.81	0.76
	3.3 Access to Growth Opportunities	0.92	0.85	0.93	0.84	0.85	0.82
	4.1 Sustainability	0.94	0.83	0.91	0.95	0.88	0.86
	4.2 Lifestyle	0.81	0.65	0.77	0.95	0.83	0.82
OUTPUT	5.1 Mid-Level Skills	0.72	0.56	0.66	0.80	0.86	0.74
	5.2 Employability	0.81	0.77	0.82	0.71	0.81	0.69
	6.1 High-Level Skills	0.84	0.68	0.84	0.87	0.86	0.95
	6.2 Talent Impact	0.83	0.66	0.85	0.82	0.76	0.95

Source: European Commission Joint Research Centre (2019).

Note: The values are the bivariate Pearson correlation coefficients ($n = 132$). Shaded values represent the coefficients between sub-pillars and the respective pillar based on the GTCI conceptual framework. Values greater than 0.70 within the shaded areas are desirable as they imply that the pillar captures at least 50% ($\approx 0.70 \times 0.70$) of the variation in the underlying sub-pillars and vice-versa.

in the great majority (12) of the 14 sub-pillars, which captures 42% (Internal Openness) to 89% (Regulatory Landscape) of the total variance in the underlying variables. A more detailed analysis of the correlation structure within and across the six pillars confirms the expectation that the GTCI sub-pillars are more correlated with their own pillar than with any other. This result suggests that the allocation of sub-pillars to pillars in the GTCI is consistent both from conceptual and statistical perspectives. Furthermore, all correlations within a pillar are positive, strong, and similar and well above 0.7, which suggests that roughly 50% (or more) of the variance in the GTCI pillar scores can be explained by an underlying sub-pillar (see Table 1). These results suggest that the conceptual grouping of GTCI sub-pillars into pillars is statistically confirmed and that the six pillars are statistically well balanced.

The six pillars also share a single statistical dimension that summarises 88% of the total variance, and the six loadings (correlation coefficients) are quite high and very similar to each other ranging from 0.87 (Attract pillar) to 0.98 (Enable pillar). The latter suggests that the six pillars contribute in a balanced way to the variation of the GTCI scores, as envisaged by the development team: all six pillars are assigned equal weights. The reliability of the GTCI, measured by the Cronbach's alpha value, is very high at 0.97—well above the 0.70 threshold for a reliable aggregate.⁵

An important part of the analysis relates to clarifying the importance of the Input and Output sub-indices with respect to the variation of the GTCI scores. As mentioned above, the GTCI is built as the simple arithmetic average of the four Input sub-pillars and the two Output sub-pillars, which implies that the

Input sub-index has a weight of 4/6 versus a weight of 2/6 for the Output sub-index. Yet this does not imply that the Input aspect is twice as important as the Output aspect in determining the variation of the GTCI scores. In fact, the correlation coefficient between the GTCI scores and the Input or Output sub-index is 0.99 and 0.96, respectively, which suggests that the sub-indices are effectively placed on an equal footing. Overall, the tests so far show that the grouping of variables into sub-pillars, pillars, and an overall index is statistically coherent, and that the GTCI has a balanced structure, whereby all six pillars are equally important in determining the variation in the GTCI scores.

2. Importance of the Variables in the GTCI Framework

The GTCI and its components are simple arithmetic averages of the underlying variables. Developers and users of composite indicators often consider that the weights assigned to the variables coincide with the variables' importance in the index. However, in practice, the correlation structure of the variables and their different variances do not always allow the weights assigned to the variables to be considered equivalent to their importance.⁶

This section assesses the importance of all 70 variables at the various levels of aggregation in the GTCI structure. The squared Pearson correlation coefficient (otherwise known as the *coefficient of determination* R^2) is used as a statistical measure of the importance of variables in an index. The importance of the selected variables is taken to be equivalent to the contribution of those variables to the variation of the aggregate scores, be those sub-pillars, pillars, sub-indices, or the overall GTCI. The overarching consideration made by the GTCI development team was that all variables should be important at all levels of aggregation.

Table 2

Importance measures for the variables at the various levels of the GTCI structure

PILLAR	SUB-PILLAR	VARIABLE NAME	SUB-PILLAR	PILLAR	INPUT/OUTPUT	GTCI INDEX
1. ENABLE	1.1 Regulatory Landscape	1.1.1 Government effectiveness	95%	93%	90%	90%
		1.1.2 Rule of law	96%	89%	85%	84%
		1.1.3. Political stability	70%	53%	52%	48%
		1.1.4 Regulatory quality	92%	88%	86%	85%
		1.1.5 Corruption	93%	84%	82%	80%
	1.2 Market Landscape	1.2.1 Competition intensity	54%	49%	43%	42%
		1.2.2 Ease of doing business	65%	65%	61%	63%
		1.2.3 Cluster development	63%	65%	61%	60%
		1.2.4 R&D expenditure	63%	59%	54%	57%
		1.2.5 ICT infrastructure	80%	70%	75%	77%
		1.2.6 Urban population	57%	41%	47%	46%
	1.3 Business Landscape	1.3.1 Tertiary-educated unemployment	31%	25%	26%	24%
		1.3.2 Active labour market policies	76%	76%	74%	75%
		1.3.3 Labour-employer cooperation	75%	59%	56%	54%
		1.3.4 Professional management	80%	75%	74%	72%
		1.3.5 Relationship of pay to productivity	79%	62%	58%	59%
		1.3.6 Technology utilisation	82%	83%	80%	79%
		1.3.7 Investment in emerging technologies	84%	73%	70%	70%
		1.3.8 Robot density	45%	49%	41%	42%
2. ATTRACT	2.1 External Openness	2.1.1 FDI and technology transfer	65%	63%	67%	64%
		2.1.2 Prevalence of foreign ownership	60%	52%	42%	38%
		2.1.3 Migrant stock	52%	46%	38%	37%
		2.1.4 International students	67%	56%	40%	39%
		2.1.5 Brain gain	69%	62%	45%	41%
	2.2 Internal Openness	2.2.1 Tolerance of minorities	56%	40%	29%	26%
		2.2.2 Tolerance of immigrants	26%	26%	13%	10%
		2.2.3 Social mobility	54%	70%	68%	66%
		2.2.4 Female graduates	27%	12%	16%	16%
		2.2.5 Gender development gap	43%	23%	25%	25%
		2.2.6 Leadership opportunities for women	46%	46%	39%	39%

(continued on next page)

The results of this analysis appear in Table 2. Examining the importance measures of the 70 variables; almost all variables are important at the various levels of aggregation.

For example, country variations in 1.1.1 Government effectiveness scores can capture 95% of the variance in the respective sub-pillar score (Regulatory Landscape), 93% of the variance in the respective pillar (Enable), and 90% of the variance in both the Input sub-index and the overall GTCI scores. Similarly, country variations in 2.1.1 Foreign direct investment (FDI) and technology transfer scores can capture 65%, 63%, 67%, and 64% of the variance in the External Openness, Attract, Input, and GTCI scores, respectively.

Two variables in the 2020 data set have a very low impact on the GTCI variance (10% or less): 3.1.3 Tertiary education expenditure and 3.2.2 Prevalence of training in firms. Therefore these variables are not found to be important at the overall index level in the 2020 framework.⁷ Five variables were flagged last year, including the two mentioned above; the other three have been removed from the framework this year (1.3.1 Ease of hiring, 1.3.2 Ease of redundancy, and 2.2.5 Gender earnings gap). That said, and given that these two variables (3.1.3 and 3.2.2) are influential at the first and second aggregation levels (sub-pillars and pillars), their inclusion in the GTCI framework is corroborated by the analysis. The JRC recommendation to the GTCI development

Table 2 (continued)

Importance measures for the variables at the various levels of the GTCI structure

PILLAR	SUB-PILLAR	VARIABLE NAME	SUB-PILLAR	PILLAR	INPUT/OUTPUT	GTCI INDEX
3. GROW	3.1 Formal Education	3.1.1 Vocational enrolment	45%	25%	17%	18%
		3.1.2 Tertiary enrolment	71%	47%	45%	49%
		3.1.3 Tertiary education expenditure	25%	17%	11%	10%
		3.1.4 Reading, maths, and science	70%	55%	53%	57%
		3.1.5 University ranking	66%	67%	55%	56%
	3.2 Lifelong Learning	3.2.1 Quality of management schools	78%	71%	66%	65%
		3.2.2 Prevalence of training in firms	43%	22%	7%	6%
		3.2.3 Employee development	80%	76%	77%	75%
	3.3 Access to Growth Opportunities	3.3.1 Delegation of authority	81%	72%	72%	70%
		3.3.2 Personal rights	40%	32%	33%	32%
		3.3.3 Use of virtual social networks	60%	47%	53%	53%
		3.3.4 Use of virtual professional networks	60%	60%	58%	57%
		3.3.5 Collaboration within organizations	74%	65%	63%	64%
		3.3.6 Collaboration across organizations	62%	56%	54%	54%
4. RETAIN	4.1 Sustainability	4.1.1 Pension system	65%	78%	60%	64%
		4.1.2 Social protection	85%	72%	77%	74%
		4.1.3 Brain retention	58%	36%	54%	51%
	4.2 Lifestyle	4.2.1 Environmental performance	83%	80%	69%	70%
		4.2.2 Personal safety	60%	61%	59%	58%
		4.2.3 Physician density	80%	66%	47%	51%
		4.2.4 Sanitation	76%	63%	46%	48%
5. VOCATIONAL AND TECHNICAL SKILLS	5.1 Mid-level Skills	5.1.1 Workforce with secondary education	72%	36%	29%	20%
		5.1.2 Population with secondary education	73%	40%	33%	24%
		5.1.3 Technicians and associate professionals	77%	71%	72%	67%
		5.1.4 Labour productivity per employee	52%	65%	67%	72%
	5.2 Employability	5.2.1 Ease of finding skilled employees	81%	42%	36%	40%
		5.2.2 Relevance of education system to the economy	89%	59%	53%	57%
		5.2.3 Skills matching with secondary education	89%	74%	69%	73%
		5.2.4 Skills matching with tertiary education	91%	58%	54%	62%
6. GLOBAL KNOWLEDGE SKILLS	6.1 Higher-Level Skills	6.1.1 Workforce with tertiary education	86%	77%	74%	66%
		6.1.2 Population with tertiary education	78%	64%	59%	52%
		6.1.3 Professionals	76%	76%	73%	68%
		6.1.4 Researchers	77%	77%	77%	73%
		6.1.5 Senior officials and managers	49%	43%	40%	34%
		6.1.6 Availability of scientists and engineers	52%	49%	57%	56%
	6.2 Talent Impact	6.2.1 Innovation output	81%	81%	76%	74%
		6.2.2 High-value exports	44%	36%	27%	23%
		6.2.3 New product entrepreneurial activity	40%	30%	28%	27%
		6.2.4 New business density	43%	34%	28%	27%
		6.2.5 Scientific journal articles	72%	77%	76%	75%

Source: European Commission Joint Research Centre (2019).

Note: The values are the squared Pearson correlation coefficients, expressed as percentages ($n = 132$ countries). The few cases where coefficients are 10% or less are in a lighter shade.

Table 3

Distribution of differences between pillar and GTCI rankings

Rank differences	GTCI INPUT SUB-INDEX				GTCI OUTPUT SUB-INDEX	
	Enable	Attract	Grow	Retain	Vocational and Technical Skills	Global Knowledge Skills
More than 30 positions	2%	14%	8%	2%	5%	10%
20 to 29 positions	9%	22%	8%	7%	8%	7%
10 to 19 positions	19%	20%	20%	25%	27%	32%
10 or more positions*	29%	57%	36%	33%	41%	48%
5 to 9 positions	22%	22%	20%	30%	26%	24%
Less than 5 positions	44%	19%	39%	32%	27%	24%
0 positions	5%	2%	5%	5%	7%	3%
Total	100%	100%	100%	100%	100%	100%

Source: European Commission Joint Research Centre (2019).

Note: * This row is the rounded sum of the prior three rows.

team is to carefully monitor how these two variables behave in the coming releases of the index and eventually to fine-tune the framework in this respect.

3. Added Value of the GTCI

A very high statistical reliability among the main components of an index can be the result of redundancy of information. This is not the case in the GTCI. In fact, the overall GTCI 2020 ranking differs from any of the six pillar rankings by 10 positions or more in at least one-third of the 132 countries included in the 2020 edition, peaking at 57% of the countries in the case of the Attract pillar (see Table 3). This is a desired outcome because it evidences the added value of the GTCI ranking, which helps to highlight other components of human capital and talent competitiveness that do not emerge directly by looking into the six pillars separately. At the same time, this result also points towards the value of duly taking into account the individual pillars, sub-pillars, and variables on their own merit. By doing so, country-specific strengths and bottlenecks in human capital and talent competitiveness can be identified and serve as an input for evidence-based policymaking.

In addition, the GTCI 2020 is compared with the World Economic Forum's 2018 Global Competitiveness Index; Cornell University, INSEAD, and WIPO's 2019 Global Innovation Index; and the World Bank's Human Capital Index, using the data extracted from these projects' websites. The rank correlation between GTCI 2020 with all three indices is substantially high (correlation ≈ 0.9), which suggests that the GTCI framework has many aspects in common with the frameworks on global competitiveness, global innovation, and human capital. Nevertheless, looking at the shifts in rankings (see Table 4), 33%, 43%, and 51% of the countries included in the GTCI 2020 that feature in the other three indices differ by 10 or more rank positions from those of the three selected international indices. This indicates that the GTCI 2020 offers additional insights into nations' human capital and competitiveness compared to the 2018 Global Competitiveness Index, the 2018 Human Capital Index, and the 2019 Global Innovation Index.

Step 4: Qualitative Review

Finally, the GTCI results, including overall country classifications and relative performances in terms of the Input and Output sub-indices, were evaluated by the development team and external experts to verify that the overall results are, to a great extent, consistent with current evidence, existing research, or prevailing theory.

Notwithstanding these statistical tests and the positive outcomes regarding the statistical soundness of the GTCI, it is important to mention that the GTCI has to remain open to future improvements as better data, more comprehensive surveys and assessments, and new relevant research studies and data become available.

IMPACT OF MODELLING ASSUMPTIONS ON THE GTCI RESULTS

Every country score on the overall GTCI and its two sub-indices depends on modelling choices: the six-pillar structure, the selected variables, the imputation or not of missing data, and the weights and aggregation method, among other elements. These choices are based on expert opinion (e.g., selection of variables) or common practice (e.g., min-max normalisation in the [0,100] range) and driven by statistical analysis (e.g., treatment of outliers) or simplicity (e.g., no imputation of missing data). The robustness analysis aims at assessing the simultaneous and joint impact of these modelling choices on the rankings. The data are assumed to be error-free since potential outliers and any errors and typos were corrected during the computation phase.

As suggested in the relevant literature on composite indicators,⁸ the robustness assessment of the GTCI was based on a combination of a Monte Carlo experiment and a multi-modelling approach that dealt with three issues: pillar weights, missing data, and the aggregation formula. In general, the uncertainty analysis aims to respond to some extent to possible criticisms that the country scores associated with aggregate measures are generally not calculated under conditions of certainty, even though they are frequently presented as such.

Table 4

Distribution of differences between the GTCI 2020 and other international rankings

Rank differences with respect to the GTCI 2020	2018 Global Competitiveness Index (World Economic Forum)	2019 Global Innovation Index (Cornell, INSEAD, WIPO)	2018 Global Human Capital Index (World Bank)
More than 30 positions	2%	9%	7%
20 to 29 positions	9%	13%	16%
10 to 19 positions	22%	20%	29%
10 or more positions*	33%	43%	51%
5 to 9 positions	23%	21%	20%
Less than 5 positions	36%	31%	25%
0 positions	8%	6%	4%
Total	100%	100%	100%
Pearson correlation coefficient with the GTCI	0.96	0.93	0.88
Spearman rank correlation coefficient with the GTCI	0.96	0.90	0.90
Countries in common with the GTCI	129	120	122

Source: European Commission Joint Research Centre (2019).

Notes: The comparison between the GTCI and the other indices was based on the common set of countries. *This row is the rounded sum of the prior three rows.

Table 5

Uncertainty analysis for the GTCI 2020: Missing data, aggregation, and pillar weights

		REFERENCE	ALTERNATIVE
I. Uncertainty in the treatment of missing values		No estimation of missing data	Expectation Maximisation (EM)
II. Uncertainty in the aggregation formula at pillar level		Arithmetic average	Geometric average
III. Uncertainty in the weights		Reference value for the weight (within the sub-index)	Distribution assigned for robustness analysis (within the sub-index)
GTCI sub-index	Pillar		
Input	Enable	0.25	U[0.15,0.35]
	Attract	0.25	U[0.15,0.35]
	Grow	0.25	U[0.15,0.35]
	Retain	0.25	U[0.15,0.35]
Output	Vocational and Technical Skills	0.50	U[0.40,0.60]
	Global Knowledge Skills	0.50	U[0.40,0.60]

Source: European Commission Joint Research Centre (2019).

While the term *multi-modelling* refers to testing alternative assumptions—that is, alternative aggregation methods and missing data estimation methods—the Monte Carlo simulation explored the issue of weighting and comprised 1,000 runs, each corresponding to a different set of weights for the six pillars, randomly sampled from uniform continuous distributions centred in the reference values. The choice of the range for the weights' variation was driven by two opposite needs: to ensure a wide enough interval to have meaningful robustness checks, and to respect the rationale of the GTCI that places equal importance on all six pillars. Given these considerations, the limit values of uncertainty intervals for the pillar weights are 15% to 35% for the four Input pillars for the calculation of the Input sub-index, and 40% to 60% for the two Output pillars for the calculation of the Output sub-index (see Table 5). For the calculation of the GTCI, the limit values of uncertainty intervals for all six pillar weights are 12% to 20%. In all simulations, sampled weights are rescaled so that they always sum to 1.

The GTCI development team, for transparency and replicability, opted not to estimate the missing data (only 5.3% of data were missing in the data set of 132 countries for all 70 variables). The 'no imputation' choice, which is common in similar contexts, might encourage countries not to report low data values. The consequence of the 'no imputation' choice in an arithmetic average is that it is equivalent to replacing an indicator's missing value for a given country with the respective mean of the other indicators that are being aggregated. Hence the available data (indicators) in the incomplete pillar may dominate, sometimes biasing the ranks up or down. To test the impact of this assumption, the JRC also estimated missing data using the Expectation Maximisation (EM) algorithm.⁹

Regarding the aggregation formula, decision-theory practitioners have challenged the use of simple arithmetic averages because of their fully compensatory nature, in which a comparatively high advantage for a few variables can compensate for a comparative disadvantage for many variables.¹⁰ Despite the

arithmetic averaging formula receiving statistical support for the development of the GTCI, as discussed in the previous section, the geometric average was considered as a possible alternative. This alternative average is a partially compensatory approach that rewards countries with similar performance in all pillars; it motivates those countries with uneven performance to improve in those pillars in which they perform poorly, and not just in any pillar.

Four models were tested based on the combination of no imputation versus EM imputation, and arithmetic versus geometric average, combined with 1,000 simulations per model (random weights versus fixed weights), for a total of 4,000 simulations for the GTCI and each of the two sub-indices (see Table 5 for a summary of the uncertainties considered in the GTCI 2020).

Uncertainty Analysis Results

The main results of the robustness analysis are shown in Figures 1a–1c, with median ranks and 90% confidence intervals computed across the 4,000 Monte Carlo simulations for the GTCI and the two sub-indices. Countries are ordered from best to worst according to their reference rank, the blue dot being the simulated median rank. Error bars represent, for each country, the interval containing 90% of all simulations. For full transparency and information, Table 6 reports the published rankings and the simulated intervals (90% of the 4,000 scenarios) that account for uncertainties in the missing data estimation, the pillar weights, and the aggregation formula. All published country ranks lay within the simulated intervals, and these are narrow enough for most countries (less than or equal to 10 positions) to allow meaningful inferences to be drawn.

GTCI ranks are shown to be both representative of a plurality of scenarios and robust to changes in the imputation method, the pillar weights, and the aggregation formula. If one considers the median rank across the simulated scenarios as being representative of these scenarios, then the fact that the GTCI rank is close to the median rank (differing by two positions or less) for 90% of the countries suggests that the GTCI is a suitable summary measure. Furthermore, the narrow confidence intervals for the majority of the countries' ranks (less than or equal to 10 positions for 93% of the countries) imply that the GTCI ranks are also, for the vast majority of the countries, robust to changes in the pillar weights, the imputation method, and the aggregation formula.

Results for the Input and Output sub-indices are also robust and representative of the plurality of scenarios considered. The Input rank is close to the median rank (less than or equal to two positions away) for 93% of the countries, and the rank intervals are less than or equal to 10 positions for 89% of the countries. Similarly, the Output rank is close to the median rank (less than or equal to two positions away) for 80% of the countries, and the rank intervals are less than or equal to 10 positions for 79% of the countries.

Overall, country ranks in the GTCI and its two sub-indices are fairly robust to changes in the pillar weights, the imputation method, and the aggregation formula for the majority of the countries considered. For full transparency and information,

Table 6 reports the GTCI country ranks (and those of the sub-indices) together with the simulated intervals (90% of the 4,000 scenarios) in order to better appreciate the robustness of these ranks to the computation methodology.

Sensitivity Analysis Results

Complementary to the uncertainty analysis, sensitivity analysis has been used to identify which of the modelling assumptions have the highest impact on certain country ranks. Figure 2 plots the GTCI and both sub-index rankings versus one-at-a-time changes of either the EM imputation method or the geometric aggregation formula (assuming equal weights for the six pillars as in the GTCI).

The most influential methodological assumption turns out to be the choice of geometric aggregation versus arithmetic aggregation, particularly in the case of the Output sub-index (given that a lower rank correlation indicates greater sensitivity). This choice has the largest impact on differences in ranking for the GTCI 2020 and the Output sub-index; it has less impact on differences for the Input sub-index. For example, in the most extreme case, Gambia and Oman fall by 14 positions in the Output ranking when geometric aggregation is applied, yet the two countries improve their position respectively by six and five positions if missing data are imputed with the EM algorithm. Note, however, that these assumptions concern methodological choices only and might overall be less influential than choices related to the background assumptions in the conceptual framework.¹¹

Overall, the ranges of uncertainty in the final rankings are fairly modest. Consequently, the JRC recommendation is not to alter the GTCI methodology at this point, but to consider country ranks in the GTCI 2020 and in the Input and Output sub-indices within the 90% confidence intervals, as reported in Table 6, in order to better appreciate to what degree a country's rank depends on the modelling choices. It is reassuring that, for an overwhelming majority of the countries included in the GTCI, their ranks in the overall GTCI 2020 and the Input and Output sub-indices are the result of the underlying data and not of modelling choices.¹²

CONCLUSIONS

The European Institute of Business Administration INSEAD released the seventh edition of the Global Talent Competitiveness Index (GTCI) perpetuating a view to attracting attention to the growing challenges of talent attraction, development, and retention faced by countries worldwide. The JRC statistical audit has investigated the workings of the GTCI framework to assess the statistical properties of the data and the methodology used in the index construction. The JRC analysis suggests that the conceptualised structure on multiple levels of the GTCI 2020 is statistically coherent and balanced. It is not dominated by any pillar or sub-pillar; all variables contribute to the variation of the respective Input/Output sub-indices and to the overall GTCI. Furthermore, the analysis has offered statistical justification for the use of equal weights and arithmetic averaging at the various levels of aggregation. It shows that the GTCI is statistically reliable in its current form as the simple average of the

Figure 1a

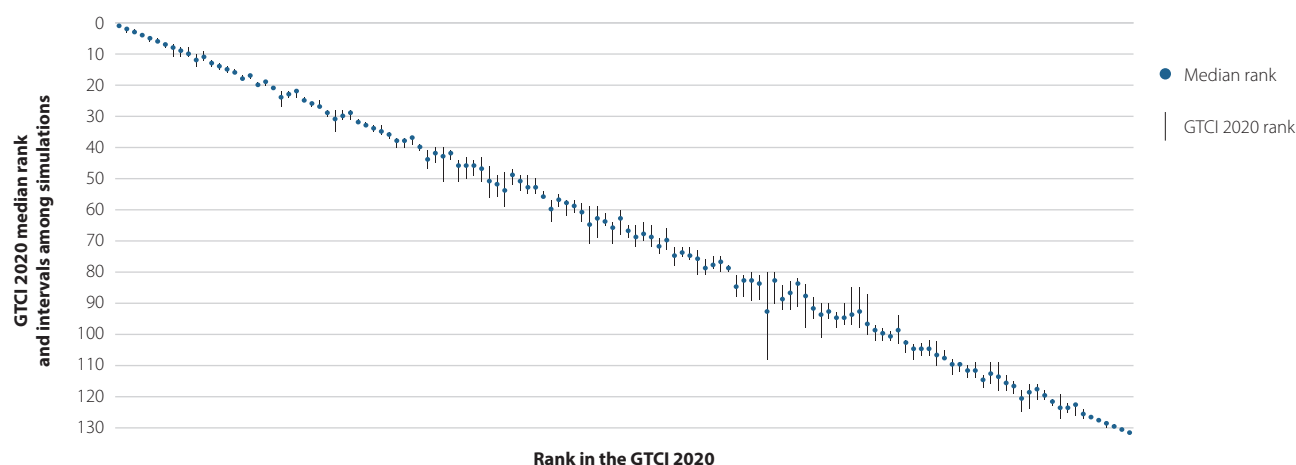
Robustness analysis (GTCI rank vs. median rank, 90% confidence intervals)

Figure 1b

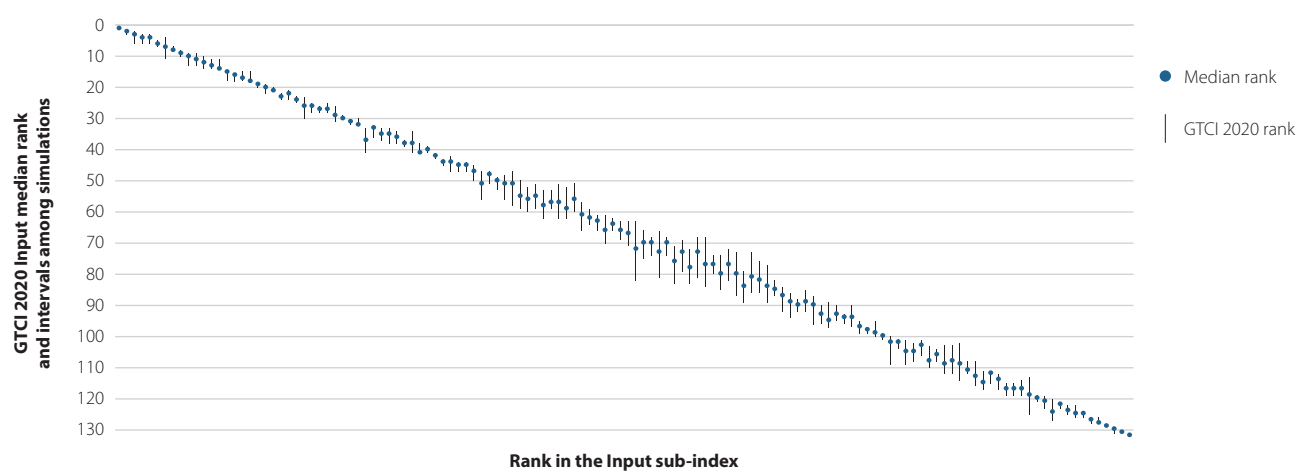
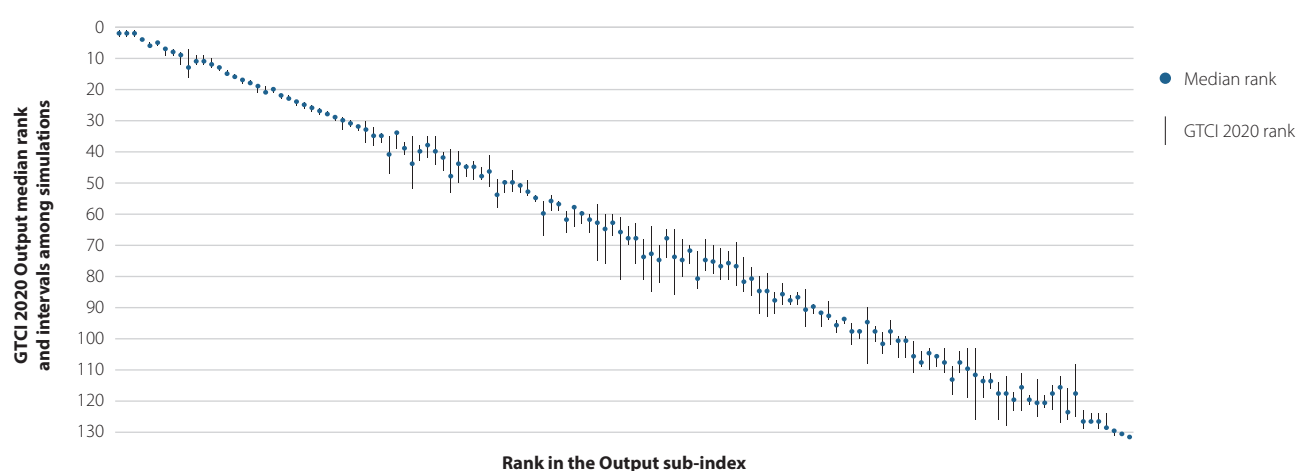
Robustness analysis (Input rank vs. median rank, 90% confidence intervals)

Figure 1c

Robustness analysis (Output rank vs. median rank, 90% confidence intervals)

Source: European Commission Joint Research Centre (2019).

Notes: The Spearman rank correlation between the median rank and the GTCI 2020 rank is 0.999 ($n = 132$); between the median rank and the GTCI 2020 Output rank it is 0.999; and between the median rank and the GTCI 2020 Input rank it is 0.999. Median ranks and intervals are calculated over 4,000 simulated scenarios combining random weights, imputation versus no imputation of missing values, and geometric versus arithmetic average at the pillar level.

Table 6

Country ranks and 90% confidence intervals for the GTCI 2020 and its Input/Output sub-indices

COUNTRY	GTCI 2020		INPUT SUB-INDEX		OUTPUT SUB-INDEX	
	RANK	INTERVAL	RANK	INTERVAL	RANK	INTERVAL
Switzerland	1	[1,1]	1	[1,1]	2	[1,3]
United States of America	2	[2,3]	2	[2,3]	1	[1,3]
Singapore	3	[2,3]	3	[2,6]	3	[1,3]
Sweden	4	[4,4]	5	[3,6]	4	[4,4]
Denmark	5	[5,6]	6	[5,7]	6	[5,6]
Netherlands	6	[5,6]	4	[3,6]	11	[9,12]
Finland	7	[7,8]	8	[7,8]	5	[5,6]
Luxembourg	8	[7,11]	7	[4,11]	14	[13,14]
Norway	9	[8,11]	10	[9,13]	8	[7,9]
Australia	10	[8,11]	9	[8,10]	15	[14,15]
Germany	11	[10,14]	12	[10,14]	10	[7,16]
United Kingdom	12	[9,12]	11	[9,13]	13	[10,13]
Canada	13	[12,14]	13	[11,14]	16	[15,16]
Iceland	14	[13,15]	16	[16,18]	9	[8,12]
Ireland	15	[14,16]	18	[15,18]	12	[9,12]
New Zealand	16	[15,16]	14	[11,14]	19	[19,21]
Austria	17	[17,18]	15	[15,18]	20	[19,21]
Belgium	18	[17,18]	17	[15,18]	18	[17,18]
Japan	19	[19,20]	19	[19,20]	22	[22,23]
Israel	20	[19,20]	23	[21,24]	7	[7,9]
France	21	[21,21]	21	[20,21]	21	[20,21]
United Arab Emirates	22	[22,27]	20	[19,22]	31	[30,32]
Malta	23	[22,24]	22	[22,24]	26	[25,27]
Estonia	24	[22,24]	27	[26,28]	17	[17,18]
Czech Republic	25	[24,25]	24	[23,25]	27	[26,28]
Malaysia	26	[26,27]	28	[25,28]	25	[24,26]
Korea, Rep.	27	[25,27]	29	[26,31]	24	[24,25]
Portugal	28	[28,30]	26	[25,28]	32	[32,33]
Qatar	29	[28,35]	25	[23,30]	39	[35,52]
Cyprus	30	[28,31]	35	[33,37]	23	[22,23]
Slovenia	31	[28,31]	31	[31,32]	28	[27,28]
Spain	32	[31,32]	30	[29,30]	41	[35,42]
Latvia	33	[32,33]	38	[37,39]	29	[29,30]
Chile	34	[33,35]	34	[33,36]	35	[34,37]
Lithuania	35	[33,36]	37	[34,38]	33	[30,37]
Italy	36	[35,37]	39	[34,41]	34	[32,38]
Costa Rica	37	[37,40]	32	[30,32]	55	[54,56]
Brunei Darussalam	38	[37,40]	43	[43,45]	30	[29,33]
Slovakia	39	[37,39]	41	[39,41]	38	[37,41]
Saudi Arabia	40	[39,41]	42	[42,43]	36	[35,47]
Bahrain	41	[41,47]	33	[33,41]	63	[57,75]
China	42	[40,45]	44	[42,47]	45	[40,50]
Oman	43	[40,51]	36	[33,38]	66	[61,81]
Poland	44	[41,44]	46	[44,47]	40	[38,43]

(continued on next page)

Table 6 (continued)

Country ranks and 90% confidence intervals for the GTCI 2019 and its Input/Output sub-indices

COUNTRY	GTCI 2020		INPUT SUB-INDEX		OUTPUT SUB-INDEX	
	RANK	INTERVAL	RANK	INTERVAL	RANK	INTERVAL
Azerbaijan	45	[44,51]	47	[45,50]	44	[39,53]
Philippines	46	[43,50]	52	[47,58]	42	[35,44]
Greece	47	[44,49]	51	[48,56]	43	[40,46]
Russia	48	[43,51]	60	[51,60]	37	[34,39]
Mauritius	49	[46,56]	45	[44,47]	56	[56,67]
Trinidad and Tobago	50	[49,56]	50	[49,53]	50	[49,58]
Uruguay	51	[48,59]	40	[38,41]	89	[85,89]
Hungary	52	[47,52]	53	[50,59]	46	[44,48]
Montenegro	53	[49,54]	57	[53,59]	47	[43,49]
Kazakhstan	54	[49,55]	54	[52,60]	52	[46,53]
Bulgaria	55	[50,55]	55	[51,59]	54	[49,54]
Argentina	56	[54,56]	49	[47,51]	61	[59,63]
Jamaica	57	[57,64]	59	[52,62]	59	[59,66]
Serbia	58	[55,59]	65	[62,66]	51	[49,53]
Croatia	59	[57,62]	67	[63,71]	53	[50,53]
Armenia	60	[57,61]	69	[66,75]	48	[45,49]
Jordan	61	[58,64]	56	[53,62]	67	[64,70]
Panama	62	[59,71]	48	[47,56]	88	[86,89]
Kuwait	63	[59,69]	58	[51,62]	78	[70,79]
Romania	64	[61,65]	64	[61,70]	60	[57,64]
Indonesia	65	[64,71]	62	[59,64]	69	[68,81]
Ukraine	66	[60,68]	84	[76,86]	49	[41,51]
Thailand	67	[65,69]	63	[61,66]	77	[68,78]
Georgia	68	[65,72]	73	[71,83]	57	[54,59]
Mexico	69	[64,70]	66	[63,69]	72	[65,74]
South Africa	70	[65,72]	77	[68,84]	58	[56,59]
Botswana	71	[69,74]	61	[57,66]	87	[82,89]
India	72	[66,73]	76	[68,81]	62	[60,66]
Namibia	73	[72,78]	71	[66,81]	71	[70,82]
Colombia	74	[72,75]	74	[69,79]	75	[70,76]
Mongolia	75	[72,76]	80	[72,82]	70	[64,85]
Albania	76	[73,81]	72	[68,74]	85	[79,93]
Peru	77	[76,81]	86	[82,87]	74	[68,80]
Turkey	78	[75,79]	81	[73,87]	82	[74,85]
Tunisia	79	[75,80]	90	[85,92]	65	[60,67]
Brazil	80	[78,80]	70	[68,74]	93	[88,94]
Dominican Republic	81	[81,88]	79	[74,85]	95	[93,95]
Ecuador	82	[81,88]	83	[73,86]	92	[91,96]
Sri Lanka	83	[80,89]	94	[90,95]	73	[65,86]
Tajikistan	84	[81,89]	97	[95,99]	64	[60,76]
Gambia	85	[80,108]	68	[63,82]	112	[103,126]
Moldova	86	[80,90]	89	[88,92]	83	[77,86]
Ghana	87	[84,92]	85	[77,89]	94	[94,98]
Kenya	88	[83,92]	91	[87,96]	84	[80,92]

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Table 6 (continued)

Country ranks and 90% confidence intervals for the GTCI 2019 and its Input/Output sub-indices

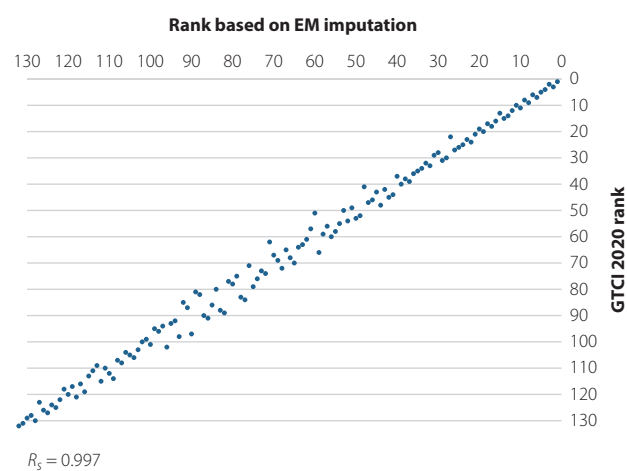
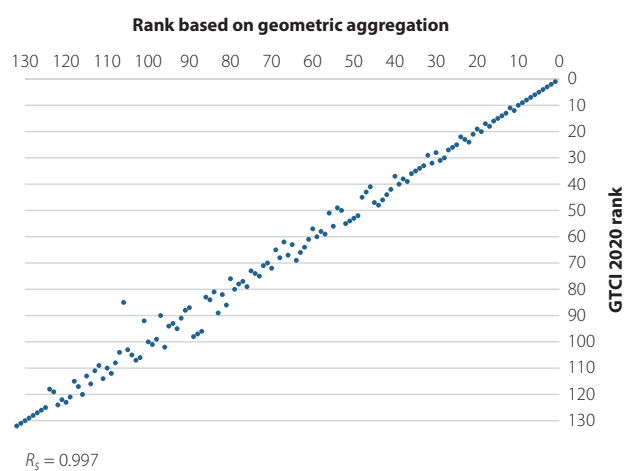
COUNTRY	GTCI 2020		INPUT SUB-INDEX		OUTPUT SUB-INDEX	
	RANK	INTERVAL	RANK	INTERVAL	RANK	INTERVAL
North Macedonia	89	[82,91]	93	[89,97]	80	[72,81]
Cabo Verde	90	[84,98]	82	[79,89]	98	[90,108]
Kyrgyzstan	91	[88,95]	98	[97,99]	76	[72,84]
Bhutan	92	[90,101]	75	[72,83]	111	[103,119]
Rwanda	93	[90,95]	78	[74,80]	110	[104,111]
Honduras	94	[93,98]	87	[84,92]	102	[99,106]
Guatemala	95	[90,97]	88	[86,94]	99	[96,101]
Viet Nam	96	[85,97]	95	[93,96]	90	[84,96]
Egypt	97	[85,98]	100	[99,101]	81	[69,83]
Lao PDR	98	[87,100]	104	[102,108]	68	[63,76]
Paraguay	99	[97,102]	92	[90,96]	106	[103,110]
Morocco	100	[98,102]	96	[90,97]	108	[103,111]
Bosnia and Herzegovina	101	[99,102]	105	[101,106]	86	[85,92]
Iran, Islamic Rep.	102	[94,103]	110	[102,114]	79	[71,81]
Zambia	103	[102,106]	101	[100,109]	100	[98,105]
Senegal	104	[103,108]	99	[95,100]	113	[112,119]
Algeria	105	[103,107]	109	[103,112]	97	[97,100]
Pakistan	106	[102,107]	114	[111,115]	91	[89,92]
Bolivia	107	[102,110]	108	[103,112]	103	[99,106]
Côte d'Ivoire	108	[105,108]	106	[103,110]	107	[105,109]
Nicaragua	109	[108,113]	102	[101,104]	117	[117,123]
El Salvador	110	[109,112]	107	[104,108]	109	[109,118]
Tanzania	111	[110,114]	103	[101,109]	119	[118,121]
Nigeria	112	[109,114]	116	[115,119]	96	[95,102]
Uganda	113	[113,117]	112	[108,116]	114	[111,116]
Venezuela, Bolivarian Rep.	114	[109,116]	119	[113,125]	101	[94,102]
Eswatini	115	[109,118]	111	[108,112]	125	[108,125]
Cameroon	116	[113,118]	120	[119,121]	104	[101,111]
Cambodia	117	[115,119]	115	[112,117]	122	[115,123]
Liberia	118	[118,125]	113	[111,117]	128	[124,129]
Lesotho	119	[116,124]	117	[115,119]	116	[112,128]
Malawi	120	[116,121]	118	[114,119]	118	[111,123]
Nepal	121	[118,121]	124	[122,125]	105	[104,109]
Burkina Faso	122	[121,123]	121	[119,123]	124	[116,126]
Ethiopia	123	[119,127]	122	[120,127]	120	[113,125]
Bangladesh	124	[122,125]	126	[124,126]	115	[114,126]
Mali	125	[123,126]	123	[121,123]	127	[124,127]
Madagascar	126	[124,127]	125	[122,126]	126	[123,129]
Zimbabwe	127	[126,127]	127	[126,128]	121	[118,122]
Mozambique	128	[128,128]	128	[126,128]	131	[130,131]
Burundi	129	[129,130]	129	[129,129]	130	[130,131]
Congo, Dem. Rep.	130	[129,130]	131	[130,131]	123	[112,127]
Angola	131	[131,131]	130	[130,131]	132	[132,132]
Yemen	132	[132,132]	132	[132,132]	129	[124,129]

Source: European Commission Joint Research Centre (2019).

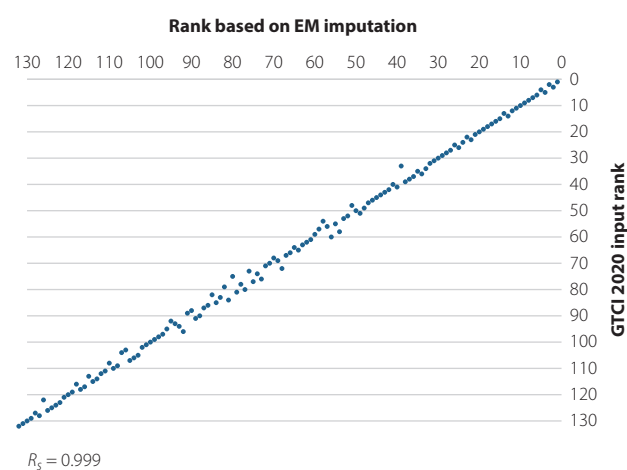
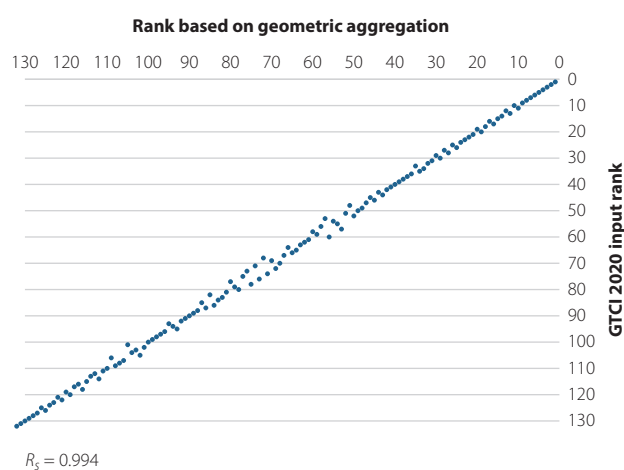
Figure 2

Sensitivity analysis: Impact of modelling choices

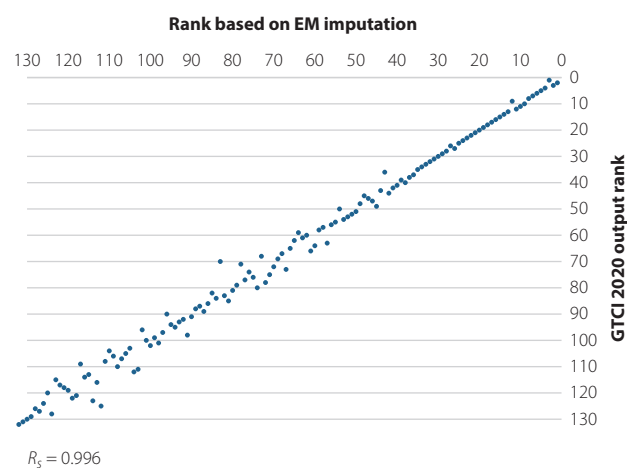
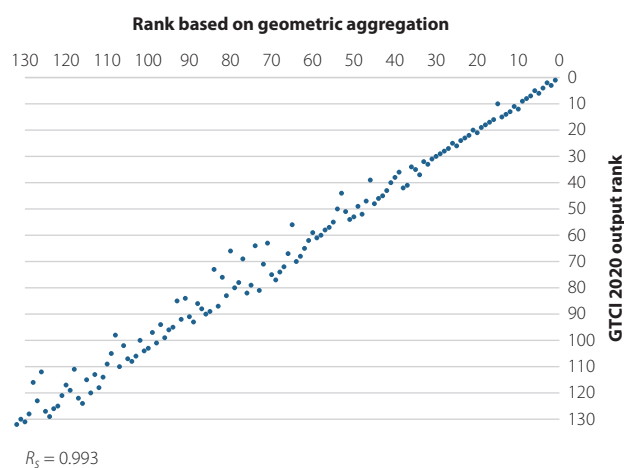
Global Talent Competitiveness 2020



GTCI 2020 Input sub-index



GTCI 2020 Output sub-index



Source: European Commission Joint Research Centre (2019).

Note: R_s represents the Spearman rank correlation coefficient ($n = 132$).

six pillars (as measured by a very high Cronbach's alpha value of 0.97, well above the recommended 0.70 threshold for a reliable aggregate).

Points that call for possible refinements of the GTCI framework were also identified. These refinements mainly concern two out of the 70 variables, namely 3.1.3 Tertiary education expenditure and 3.2.2 Prevalence of training in firms. Although conceptually enriching the GTCI framework—in most cases the statistical impact of these variables reaches the second aggregation level (the GTCI pillars)—their impact on the GTCI ranking is low and can explain only a small (negligible) amount of variation in the GTCI scores. It is recommended that the GTCI development team delves into the formulation of these two indicators and carefully monitor how they behave in the coming releases of the index, eventually fine-tuning the GTCI framework in this respect. Although the GTCI index shows reliable robustness to the imputation of missing data, it is suggested that particular attention be paid to the data coverage of three variables (i.e., 1.3.8 Robot density, 3.1.4 Reading, maths, and science, and 6.2.3 New product entrepreneurial activity).

On the whole, the analysis of the correlations at the sub-pillar level reveals that the statistical structure of the GTCI is coherent with its conceptual framework, given that sub-pillars correlate strongly with their respective pillars. Furthermore, all pillars correlate strongly and fairly evenly with the GTCI itself, which indicates that the framework is well balanced.

The GTCI and both sub-index country ranks are relatively robust to methodological assumptions related to the estimation of missing data, weighting, and aggregation formula. It is reassuring that for a large majority of the countries included in the GTCI, the overall rank and those in the Input and Output sub-indices are the result of the underlying data and not of the modelling choices. Consequently, inferences can be drawn for most countries in the GTCI, although some caution may be needed for a few countries.¹³ Note that perfect robustness would have been undesirable because this would have implied that the GTCI components are perfectly correlated and hence redundant, which is not the case for the GTCI 2020. In fact, one way in which the GTCI helps to highlight other components of human capital and talent competitiveness is by pinpointing the differences in rankings that emerge from a comparison between the GTCI and each of the six pillars. In the analysis, the GTCI ranking differs from any of the six pillar rankings by 10 positions or more for at least 29% (up to almost 60%) of the countries. This outcome both evidences the added value of the GTCI ranking and points to the importance of taking into account the individual pillars, sub-pillars, and variables on their own merit. By doing so, country-specific strengths and bottlenecks in human capital and talent competitiveness can be identified and serve as an input for evidence-based policymaking.

The auditing conducted herein has shown the potential of the Global Talent Competitiveness Index 2020, subject to some minor hints for future releases, for reliably identifying weaknesses and best practices and ultimately monitoring national performance in human capital and competitiveness issues around the

world. Readers and policy analysts should also go beyond the overall GTCI scores and ranks and duly consider the individual indicators and pillars on their own merit. By doing so, country-specific strengths and challenges in attracting, developing, and retaining talent can be identified and serve as an input for data-informed policy analysis. The Global Talent Competitiveness Index cannot possibly serve as the ultimate and definitive yardstick of monitoring progress and performance on talent and competitiveness. Instead, the GTCI best represents an ongoing attempt by INSEAD to contribute to policy discussions on the very many challenges that national systems face in a world that is increasingly dependent on talent, continuously adapting the GTCI framework to reflect improved and new data sources and the theoretical advances on how to leverage talent as a tool for competitiveness.

ENDNOTES

- 1 The JRC analysis was based on the recommendations of the OECD & EC JRC (2008) *Handbook on Constructing Composite Indicators* and on more recent research from the JRC. The JRC auditing studies of composite indicators are available at <http://composite-indicators.jrc.ec.europa.eu/> (all audits were carried out upon request of the index developers).
- 2 OECD & EC JRC (2008).
- 3 Compared to last year, eight new countries were added in the GTCI 2020: Angola, Bolivia, Burkina Faso, Cabo Verde, Côte d'Ivoire, Eswatini, Jamaica, and North Macedonia, while Lebanon is not included this year.
- 4 Groeneveld & Meeden (1984) set the criteria for absolute skewness above 1 and kurtosis above 3.5. The skewness criterion was relaxed herein to account for the small sample (132 countries).
- 5 See Nunnally (1978).
- 6 See Becker et al. (2017) and Paruolo et al. (2013) for discussions on why the weights assigned to the variables do not necessarily coincide with the variables' importance in an index.
- 7 3.2.2 Prevalence of training in firms is not found to be important at the Input sub-index.
- 8 Saisana et al. (2005), (2011); Saisana & Saltelli (2011); Saltelli et al. (2008); Vértessy (2016); Vértessy & Deiss (2016).
- 9 The Expectation-Maximization (EM) algorithm (Little & Rubin, 2002) is an iterative procedure that finds the maximum likelihood estimates of the parameter vector by repeating two steps: (1) The expectation E-step: Given a set of parameter estimates, such as a mean vector and covariance matrix for a multivariate normal distribution, the E-step calculates the conditional expectation of the complete-data log likelihood given the observed data and the parameter estimates. (2) The maximization M-step: Given a complete-data log likelihood, the M-step finds the parameter estimates to maximize the complete-data log likelihood from the E-step. The two steps are iterated until the iterations converge.
- 10 Munda (2008).
- 11 Saltelli & Funtowicz (2014).
- 12 As already mentioned in the uncertainty analysis, about 89% of the simulated median ranks for the GTCI and 97% for the Input sub-index are less than two positions away from the reported 2019 rank—this percentage drops only to 84% in the Output sub-index.
- 13 Caution is needed when drawing inference on the relative standing of the following countries vis-à-vis other countries because of the very wide range of the confidence intervals, of almost 30 positions or more: Gambia's rank in the GTCI—with a rank confidence interval range of [80, 108], and in the Input and Output sub-indices with a confidence interval range of [63, 82] and [103, 126], respectively—and Mongolia's rank in the Output sub-index [64, 85].

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Special Section

Cities and Regions

CHAPTER 7

Cities' Talent Competitiveness in 2020: How AI Is Making a Difference at the Local Level

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INSEAD

In 2020, the role of cities continues to grow in importance on multiple different fronts. As some large nation-states continue to withdraw from international disciplines (multilateralism) and agreements (such as the Paris Agreement on climate change), cities take on additional responsibilities by weaving new ties across borders and adopting innovative solutions to address some of the dominant issues of the day: environmental sustainability and inequalities, but also health and education, to name a few. Hence it is no surprise to see cities among the early adopters of Artificial Intelligence (AI)-based solutions.

Combined with the trends detected and assessed in previous editions of the Global Talent Competitiveness Index (GTCI), the emergence of AI in city strategies points to an acceleration of the significance of the role of cities on the front of global talent competitiveness. As underlined by international AI figure Cédric Villani, the city of Tianjin announced investments of US\$15 billion in AI—six times the total amount devoted by France's public investment authorities to the same issue.¹ Although recent studies have shown that no major city is fully prepared to face the

challenges of AI disruption, they generally agree that Asian cities, including a large number of Chinese cities, are ahead of the pack.²

AI IS REINFORCING THE ROLE OF CITIES AS TALENT HUBS

In this frontier area, cities have become a gigantic set of testbeds for AI-based solutions. Sometimes against the background of insufficient or limited regulatory guidelines, face-recognition video-surveillance equipment has been deployed and data have been collected about the consumption patterns, moves, and sometimes moods of citizens. Opinions and acceptance levels of this degree of surveillance have differed widely among cities in different continents and contexts. The growing appeal of 'smart cities' will continue to feed that trend.³

As cities continue to develop their own strategies to become talent hubs, they will leverage AI as a tool to increase their competitive advantages on both the supply and the demand sides identified in Chapter 1 of this report. On the demand side, they will strive to grow, attract, and retain key AI-related

BOX 1: HOW CITIES COMPETE FOR AI TALENT: THE EXAMPLES OF MONTREAL AND SINGAPORE

Even if Silicon Valley remains the place most people will think of when *Artificial Intelligence (AI)* is mentioned, a number of cities and regions around the world have adopted strategies to compete in this strategic sector. Not all of them enjoy the concentration of high-level universities, start-ups, and information technology (IT) giants that is typical of the West Coast of the United States. Hence, they have adopted aggressive and imaginative talent initiatives as core elements of their AI strategies. Montreal and Singapore are remarkable examples on that front, although their approaches differ in several important ways.

- **Montreal** has adopted a strategy to become an AI hub by devoting significant efforts to attract national and foreign investment: Since 2016, several high-tech giants—including Facebook, Google, Microsoft, DeepMind, Stradigi AI, and Element AI—have set up AI labs in the city. City officials explain this success by pointing not only to the excellent collaborative environment between researchers and companies, as well as to the presence of a large (and growing) community of AI researchers with competitive financial expectations, but also to the quality of life offered by the city. Most recently, Montreal's Yoshua Bengio won the Turing Award, along with Canadians Geoffrey Hinton and Yann LeCun, for their work on artificial neural networks. Other Canadian cities (e.g., Toronto and Ottawa) are following similar paths.

- **Singapore** has identified three priority pillars for becoming an AI hub: AI research, AI technology, and AI innovation. These pillars form the core of AI Singapore (<https://www.aisingapore.org>), a government entity whose mission is 'to anchor deep national capabilities in Artificial Intelligence, thereby creating social and economic impacts, grow local talent, build an AI ecosystem and put Singapore on the world map'. To achieve this, AI Singapore has developed a specific website for that purpose. Subtitled 'Growing our own timber', the AI Singapore Talent Portal (reserved for Singapore-based companies) aims to connect potential employers looking for AI talent to apprentices from the AI Apprenticeship Programme (AIAP, <https://www.aisingapore.org/industryinnovation/aiap/>). Employers may post their AI-related job opportunities on this portal where interested apprentice(s) can apply directly. The AIAP aims to groom local AI talent by enhancing their technical careers as well as their skills. Over a nine-month intensive period (two months of AI coursework in areas such as Deep Learning and Machine Learning applications, followed by seven months of on-the-job training in a real-world AI problem), the apprentices gain exposure to and work on real-world industry projects from scoping problem statements to deploying models. After this they return to industry. During their nine months of apprenticeship, successful candidates receive a monthly stipend of between 3,500 and 5,500 Singapore dollars (about US\$2,500 to US\$4,000) from the government of Singapore.

talents—those who can conceptualise and program the underlying algorithms and develop the related AI applications and services. On the supply side, they will associate AI with their branding strategies and use available AI tools to target and attract internationally mobile talents for all sectors relevant to their development and strategies (see Box 1).

At the city level, too, the geo-strategic mapping of AI identified in Chapter 1 prevails: Northern American cities are ahead in various areas, including governance and maturity vis-à-vis the adoption of AI-based solutions; Chinese cities clearly lead in terms of the adoption and deployment of such solutions. However, in all parts of the world cities of all sizes and types are adopting original approaches.⁴ The example of Bilbao is remarkable in that context, as it incarnates some of the ways in which a medium-sized city (Bilbao has fewer than 350,000 inhabitants) can develop a successful AI-based talent strategy through agility, imagination, and political will. This approach is further described in the chapter by Ivan Jiménez Aira and Leire Lagunilla Ramos (see Chapter 8 below).

Large companies are accompanying and reinforcing such city strategies. As AI becomes an increasing part of their strategies

and priorities, businesses of all sizes (from start-ups to large multinationals) become more sensitive to the comparative talent advantages of cities, as well as to their AI positioning (which is evident in smart cities). The establishment of Google's research centre in Zurich, for instance, can be seen as an example of this synergy. So is the choice made by Porsche to establish its Digital Lab in Berlin,⁵ illustrated by an interview with Anja Hendel, its director (see the GTCI Special Interview at the end of this section).

WHAT DO THE DATA TELL US?

This year's version of the GCTCI model is in many ways a continuation of the structure and methodology used in previous years. At the same time, there are several important new features to the GCTCI 2020, as efforts have been made to improve its architecture, the variables/data used, and the city coverage. Some of these improvements are in no small part the result of feedback provided by the European Commission Joint Research Centre on the GCTCI 2019. The most significant changes include:

- A greater number of cities covered: 155 cities, up from 114 cities last year

- The introduction of more business- and impact-oriented indicators related to such issues as ease of doing business, foreign direct investment (FDI), and patent applications
- A higher share of values that are observed at the level of cities, rather than at regional or national levels

The current GCTCI model and its structure, as well as the resulting data and rankings, are described in greater detail below. As in previous editions of the index, methodological improvements explain a non-negligible part of the changes in rankings from one year to the next. The inclusion of an additional 41 cities also implies that the performance of many cities already included in last year's rankings is being pushed down, even in the absence of a deterioration in their overall performance.

Key Findings Emerging from the GCTCI 2020

All these *caveat emptors* considered, and in addition to the detailed findings described later in this chapter, some main findings emerge from this year's GCTCI data and related analyses:

- The geographical distribution of top talent competitive cities is more balanced than that of top talent competitive countries: This year's top 10 cities include four American cities (New York, San Francisco, Boston, and Los Angeles), three European cities (London, Paris, and Munich), and three Asian cities (Singapore, Hong Kong, and Tokyo). For the top 20, those numbers are respectively seven, eight, and three, with the other two located in Australia and Canada.
- Cities with a proven ability for future readiness tend to dominate the rankings: Activity in fields such as AI or advanced technologies, including fintech and medtech, clearly favour the talent performance of cities such as San Francisco, Boston, Singapore, New York, and London, but also Dublin, Copenhagen, Stockholm, and Zurich, for example.
- Quality of life remains a strong advantage in the global competition for talents. Medium-sized cities such as Geneva and most Nordic cities benefit from their high scores in areas such as environment, safety, and social/professional binding.
- International connectivity continues to be an even stronger advantage for cities competing for highly mobile talents: Ubiquitous broadband and good availability of international transport hubs (airports, railways, and roadways) are key tools to the productivity of local and foreign talents, and to allowing cities to become hubs by attracting visitors and conferences, for example.
- Large cities undoubtedly retain a critical mass advantage when it comes to talent competitiveness. However, small cities show a growing ability to develop innovative

solutions to grow, attract, and retain talents. This ability is globally amplified as exchanges of experiences and meetings continue to grow in number among such cities.

- The number of (mainland) Chinese cities continues to grow in the GCTCI (14 Chinese cities are included this year as opposed to 11 last year). This reflects not only better data collection abilities, but also the increasing ability of those cities to develop and implement innovative talent strategies, often related to the rapid deployment of smart city solutions, which are often AI-intensive.

In addition, analysis of the GCTCI 2020 suggests several ways in which cities can spur talent competitiveness. Three key messages that emerge from this year's results are the following:

Opportunities Abound for Every City

The point made in previous GCTCI editions—that there are positive feedback loops in action across various dimensions of talent competitiveness—remains valid. However, it is also the case that virtually no city performs consistently well in all five pillars. This means, therefore, that every city has opportunities to improve its performance considerably in at least one dimension of talent competitiveness. For instance, US cities often have relatively low scores in the Retain pillar and many of them should therefore increase their efforts to strengthen this aspect.⁶ Similarly, all Latin American cities are in the bottom quartile when it comes to the Enable pillar, which suggests that improving this dimension should be one of their priorities.

Strategies Can Build on the Synergies of Cities and Countries

Cities have at their disposal some tools to strengthen talent competitiveness that differ from those at the national level (city-states being an obvious exception). This can make them more active, nimble players in the race for human skills. At the same time, the national context matters and the high correlation between city and country performance in the GCTCI and GTCI does not therefore come as a surprise. This suggests, then, the importance of working together at sub-national and national levels to ensure that, at the very least, everyone is pulling in the same direction to strengthen talent competitiveness.

Cities Need to Be Smart

The fact that the weakest dimension of many top-performing cities relates to the Retain pillar hints at a conundrum: Successfully enabling, attracting, and growing talent can give rise to new challenges that, if not met properly, can stifle talent competitiveness. In a manner of speaking, a city can, simply put, become a victim of its own success. Cities therefore need to perform a balancing act where talent is nurtured without detriment to other aspects of city life. To do so, they must be smart in two senses of the word: They must be intelligent in their policy choices and must be active in benefitting from technology to become smart cities. The case studies of AI-based strategies in Berlin and Bilbao

Figure 1
GCTCI 2020 model and indicators



that are discussed in the remainder of this Special Section provide two poignant examples on how this can be achieved.

Architecture of the GCTCI Model

The five pillars of last year's GCTCI model have been largely retained this year. The first four pillars are completely unchanged and continue to follow the same logic as the input-related pillars of the GTCI model by analysing how cities (1) Enable, (2) Attract, (3) Grow, and (4) Retain talent. The one slight modification to the model concerns the fifth pillar. The last couple of editions have referred to this pillar as *Be Global*, with the rationale that it should give a sense of the flows of talent to and from cities. The pillar has been renamed *Global Knowledge Skills* this year in order to emphasise a focus on talent impact as well as the degree of internationalisation of cities. In addition, this change in terminology is in keeping with the GTCI model.

The GCTCI model contains 16 indicators in total, with each pillar including at least three variables (the Retain pillar has four). Nine of these variables are the same as before or refer to the same concept. One of the seven new variables relates to patent applications and has been placed in the renamed Global Knowledge Skills pillar, as a measure of talent impact. Two indicators concerned with FDI have been introduced: the number of FDI projects in Attract and the number of jobs created by FDI in Grow, where the former captures a dimension of external openness and the latter is a reflection of multinational companies' (MNCs) contribution to building skills. One of the other changes to the GCTCI model is that, in contrast to previous years, indicators

that relate to quality of life and environment have been moved from Attract to Retain. The indicator Presence of Forbes Global 2000 HQs has switched from Enable to Attract, while the GDP per capita variable has been moved in the opposite direction. Figure 1 presents the architecture of the GCTCI 2020 model and the indicators populating it.

Data sources for populating the GCTCI 2020 include the following:⁷

- Eurostat has been frequently used for European Union (EU) countries.
- The American Community Survey has been frequently sourced for the United States.
- Publicly available global rankings and data sets have been used for all cities for certain variables or to obtain specific values (e.g., UN-Habitat, Forbes Global 2000, fDi Markets, and the TomTom Traffic Index).
- Local sources, including government agency websites, reports, and related press releases, have been consulted to obtain and/or verify specific values.

Usually, missing values have been denoted 'n/a'. For three indicators, it has been deemed that proxied estimates were the better option. In the case of indicator 1.3 Ease of doing business, which itself is based on the largest cities, the values have

Figure 2
Cities included in GCTCI 2020*



Note: Highlighted cities are those in the top 10 of this year's GCTCI.
*European cities are displayed separately (see Figure 3 below).

Figure 3

A closer look at European cities

Note: Highlighted cities are those in the top 10 of this year's GCTCI.

been applied to smaller cities within the country or sub-national Doing Business reports have been used to calculate estimates. For indicator 4.1 Safety, regional or national estimates have been used for 15 cities. In the case of 4.4 Affordability, the average value of cities within a country has been applied to those cities from the same country without values, while a mapping against a comparable source has been used to estimate values for cities from countries not covered in the main source.

The computation of the GCTCI involved seven main steps. First, data were collected at the city level. Second, data not available at the city level were either kept as missing (designated 'n/a') or, where needed and appropriate, were proxied by regional or national values or by mapping comparable sources. Third, the data set was tested for missing data points using the double threshold approach. More specifically, each city had to have data points for at least 50% of all variables and for at least two indicators per pillar, while each variable had to include observations for at least 50% of all cities. Fourth, using the same methodology as the GTCL, the presence of outliers in the data set was tested and, where needed, the outliers were treated (see Appendix I for details on the detection and treatment of outliers). Fifth, the resulting data set was normalised. Sixth, pillar scores and ranks

were computed by averaging their respective variables. Seventh, the overall GCTCI score and rank were calculated by averaging the scores of the five pillars.

City Coverage

The fourth edition of the GCTCI covers 155 cities from 75 economies around the world (Figure 2). This is up from last year's 114 cities, which were located in 64 economies. The greater coverage is the result of a combination of factors, including the proactivity of GCTCI's research team in identifying new sources and indicators, as well as the contributions and feedback received from a number of municipalities around the world, which volunteered to share verifiable local data.

The GCTCI coverage remains largely European (61 cities out of 155; Figure 3), primarily because of the large availability of data that stem from the work produced by Eurostat in collecting data at the city level. The share of European cities in the index has decreased further this year, however, as efforts have been made to expand the geographic scope of the GCTCI. Hence, European cities now account for less than two-fifths of the total, with the number of cities covered increasing in each region. The geographic breakdown this year for non-European cities is as follows:

Table 1

Global Cities Talent Competitiveness Index rankings and overall scores

RANK	CITY	OVERALL SCORE	RANK	CITY	OVERALL SCORE	RANK	CITY	OVERALL SCORE	RANK	CITY	OVERALL SCORE
1	New York (United States)	73.7	40	Brussels (Belgium)	51.7	79	Ljubljana (Slovenia)	42.2	118	Pune (India)	32.8
2	London (United Kingdom)	71.7	41	Milan (Italy)	51.2	80	Doha (Qatar)	42.2	119	Zagreb (Croatia)	32.5
3	Singapore (Singapore)	71.4	42	Philadelphia (United States)	51.1	81	Mumbai (India)	42.1	120	Gurugram (India)	32.2
4	San Francisco (United States)	68.1	43	Brisbane (Australia)	51.1	82	Kiel (Germany)	42.1	121	Zhuhai (China)	31.9
5	Boston (United States)	66.8	44	Oslo (Norway)	51.0	83	Bilbao (Spain)	41.9	122	Kuwait City (Kuwait)	31.1
6	Hong Kong (SAR, China)	66.4	45	Edinburgh (United Kingdom)	50.9	84	Sao Paulo (Brazil)	41.8	123	Casablanca (Morocco)	31.1
7	Paris (France)	65.7	46	Taipei (Chinese Taipei)	50.8	85	Vilnius (Lithuania)	41.6	124	Lima (Peru)	30.8
8	Tokyo (Japan)	65.7	47	Warsaw (Poland)	50.3	86	Bucharest (Romania)	41.3	125	Delhi (India)	30.6
9	Los Angeles (United States)	62.8	48	Gothenburg (Sweden)	49.6	87	Santiago (Chile)	41.0	126	Minsk (Belarus)	29.3
10	Munich (Germany)	61.9	49	Luxembourg (Luxembourg)	49.4	88	Buenos Aires (Argentina)	40.9	127	Zhengzhou (China)	29.3
11	Sydney (Australia)	61.2	50	Hamburg (Germany)	49.4	89	Nantes (France)	40.9	128	Montevideo (Uruguay)	29.1
12	Toronto (Canada)	60.2	51	Dubai (United Arab Emirates)	49.3	90	Zaragoza (Spain)	40.6	129	Rabat (Morocco)	29.1
13	Dublin (Ireland)	60.1	52	Ottawa (Canada)	48.8	91	Istanbul (Turkey)	40.5	130	Bogota (Colombia)	28.4
14	Chicago (United States)	60.0	53	Eindhoven (Netherlands)	48.2	92	Budapest (Hungary)	40.1	131	Baku (Azerbaijan)	28.1
15	Copenhagen (Denmark)	59.7	54	The Hague (Netherlands)	48.1	93	Tallinn (Estonia)	39.8	132	Ankara (Turkey)	28.1
16	Seattle (United States)	59.6	55	Moscow (Russia)	47.7	94	Busan (South Korea)	39.5	133	Kolkata (India)	27.7
17	Zurich (Switzerland)	58.8	56	Rotterdam (Netherlands)	47.4	95	Bratislava (Slovakia)	39.3	134	Cape Town (South Africa)	27.7
18	Stockholm (Sweden)	57.9	57	Bangkok (Thailand)	47.1	96	Marseille (France)	39.3	135	Rio de Janeiro (Brazil)	27.3
19	Houston (United States)	57.5	58	Kuala Lumpur (Malaysia)	47.0	97	Guangzhou (China)	39.2	136	Johannesburg (South Africa)	27.3
20	Amsterdam (Netherlands)	57.3	59	Hanover (Germany)	46.9	98	Mexico City (Mexico)	38.5	137	Nairobi (Kenya)	26.6
21	Melbourne (Australia)	56.8	60	Frankfurt (Germany)	46.6	99	Turin (Italy)	38.5	138	Skopje (North Macedonia)	26.4
22	Seoul (Korea, Rep.)	56.7	61	Lyon (France)	46.3	100	Wuhan (China)	38.3	139	Kiev (Ukraine)	26.3
23	Atlanta (United States)	56.4	62	Lisbon (Portugal)	46.2	101	Brno (Czech Republic)	38.0	140	Medellin (Colombia)	26.2
24	Madrid (Spain)	56.4	63	Antwerp (Belgium)	46.2	102	Tianjin (China)	37.6	141	Quito (Ecuador)	25.9
25	Washington, DC (United States)	56.2	64	Nagoya (Japan)	46.1	103	Riga (Latvia)	37.6	142	Abidjan (Côte d'Ivoire)	25.1
26	Dallas (United States)	56.1	65	Abu Dhabi (United Arab Emirates)	45.5	104	Riyadh (Saudi Arabia)	36.8	143	Brasilia (Brazil)	24.7
27	Miami (United States)	55.9	66	Bengaluru (India)	45.2	105	Athens (Greece)	36.4	144	Makassar (Indonesia)	24.2
28	Barcelona (Spain)	55.8	67	Hangzhou (China)	45.1	106	Xi'an (China)	36.3	145	Hanoi (Viet Nam)	23.4
29	Montreal (Canada)	55.8	68	Auckland (New Zealand)	44.6	107	Sofia (Bulgaria)	36.2	146	Accra (Ghana)	23.2
30	Vancouver (Canada)	54.7	69	Prague (Czech Republic)	44.1	108	Hyderabad (India)	35.7	147	Phnom Penh (Cambodia)	22.7
31	Helsinki (Finland)	54.6	70	Rome (Italy)	43.9	109	Chengdu (China)	35.4	148	Medan (Indonesia)	22.6
32	Shanghai (China)	54.0	71	Yokohama (Japan)	43.3	110	Jakarta (Indonesia)	35.3	149	Tunis (Tunisia)	22.3
33	Denver (United States)	53.9	72	Tel Aviv (Israel)	43.1	111	St. Petersburg (Russia)	35.2	150	Addis Ababa (Ethiopia)	21.9
34	Geneva (Switzerland)	53.9	73	Krakow (Poland)	43.1	112	Chongqing (China)	35.0	151	Abuja (Nigeria)	21.8
35	Beijing (China)	52.9	74	Bologna (Italy)	43.0	113	Belgrade (Serbia)	34.6	152	Lahore (Pakistan)	19.6
36	Vienna (Austria)	52.6	75	Nanjing (China)	42.9	114	Ho Chi Minh City (Viet Nam)	34.2	153	Lagos (Nigeria)	19.4
37	Düsseldorf (Germany)	52.2	76	Birmingham (United Kingdom)	42.8	115	Manila (Philippines)	33.5	154	Cairo (Egypt)	17.4
38	Osaka (Japan)	51.8	77	Cardiff (United Kingdom)	42.7	116	Suzhou (China)	33.2	155	Karachi (Pakistan)	16.3
39	Berlin (Germany)	51.7	78	Shenzhen (China)	42.4	117	Valletta (Malta)	33.1			

Note: Non-European cities are italicised. Colours indicate quartile and range from dark (the top quartile) to light (the bottom quartile).

Table 2

Top 10 city rankings and scores, by GCTCI pillar

Pillar 1: Enable			Pillar 2: Attract			Pillar 3: Grow			Pillar 4: Retain			Pillar 5: Global Knowledge Skills		
RANK	CITY	SCORE	RANK	CITY	SCORE	RANK	CITY	SCORE	RANK	CITY	SCORE	RANK	CITY	SCORE
1	Singapore	88.7	1	New York	79.0	1	Beijing	83.7	1	Valletta	91.4	1	Tokyo	86.8
2	Dublin	73.4	2	Hong Kong	77.7	2	Boston	81.7	2	Kiel	88.8	2	London	84.8
3	San Francisco	73.1	3	London	77.3	3	Zurich	80.4	3	Bilbao	88.3	3	New York	72.0
4	Boston	68.5	4	Paris	70.6	4	Hangzhou	77.8	4	Dusseldorf	88.2	4	Paris	69.7
5	New York	65.0	5	Dubai	68.0	5	Bengaluru	75.4	5	Göteborg	88.1	5	Seoul	69.1
6	Abu Dhabi	64.9	6	Singapore	64.7	6	New York	74.7	6	Hanover	87.7	6	San Francisco	68.6
7	Hong Kong	64.1	7	Sydney	60.0	7	Kuala Lumpur	74.2	7	Luxembourg	87.5	7	Atlanta	61.8
8	Denver	63.1	8	San Francisco	57.9	8	London	70.3	8	Vienna	87.2	8	Washington, DC	61.7
9	Copenhagen	62.7	9	Shanghai	56.5	9	Moscow	70.3	9	Oslo	86.8	9	Chicago	61.2
10	Philadelphia	62.5	10	Tokyo	55.9	10	Los Angeles	67.7	10	Frankfurt	86.6	10	Los Angeles	60.7

9 cities in Central and Southern Asia; 36 in Eastern, Southeastern Asia and Oceania; 11 in Latin America and the Caribbean; 13 in Northern Africa and Western Asia; 17 in Northern America; and 8 in Sub-Saharan Africa.

As in previous years, the cities included in the GCTCI represent a mix of large and small urban centres, some of which are national capitals or leading urban centres while others could be seen as secondary hubs or even remote locations. The cities were identified on the basis of their reputation and growing footprint in attracting global talent rather than as a function of their size or national-capital status. The availability and comparability of data obviously also played a key role in this selection.⁸

GCTCI DETAILED FINDINGS

The top-ranked city in GCTCI 2020 is New York, which is just ahead of London in 2nd place and Singapore in 3rd (Table 1). They are followed by two other US cities: San Francisco (4th) and Boston (5th). Of the remaining five cities in the top 10, two are from Europe (Paris, 7th; Munich, 10th), two are from Eastern Asia (Hong Kong, 6th; Tokyo, 8th), and one is in the United States (Los Angeles, 9th).

Admittedly, this year's top 10 look quite different from those of last year. Only three of the top 10 in GCTCI 2020 were also there in GCTCI 2019 (New York, Boston, and Paris). Even more notable is that some of last year's star performers have fallen radically through the rankings. The most striking case is Washington, DC, which was the highest-ranked city last year but is ranked 25th this year. Helsinki (31st), Vienna (36th), and Oslo (44th) are some of the other top 10 cities in GCTCI 2019 that have slipped considerably this year.

There are two main reasons for such fluctuations in the rankings. First, the changes to the GCTCI model this year inevitably result in some performances that differ markedly from last year. For instance, Washington, DC, has a relatively low number of FDI projects, which clearly has a negative impact on its rank. Second, the increase in city coverage can make a fall in rankings appear greater than it is. To give a concrete example: Berlin's

drop in rank from 32 to 39 can partly be explained by the inclusion of five new cities in this year's GCTCI that are ranked above it.

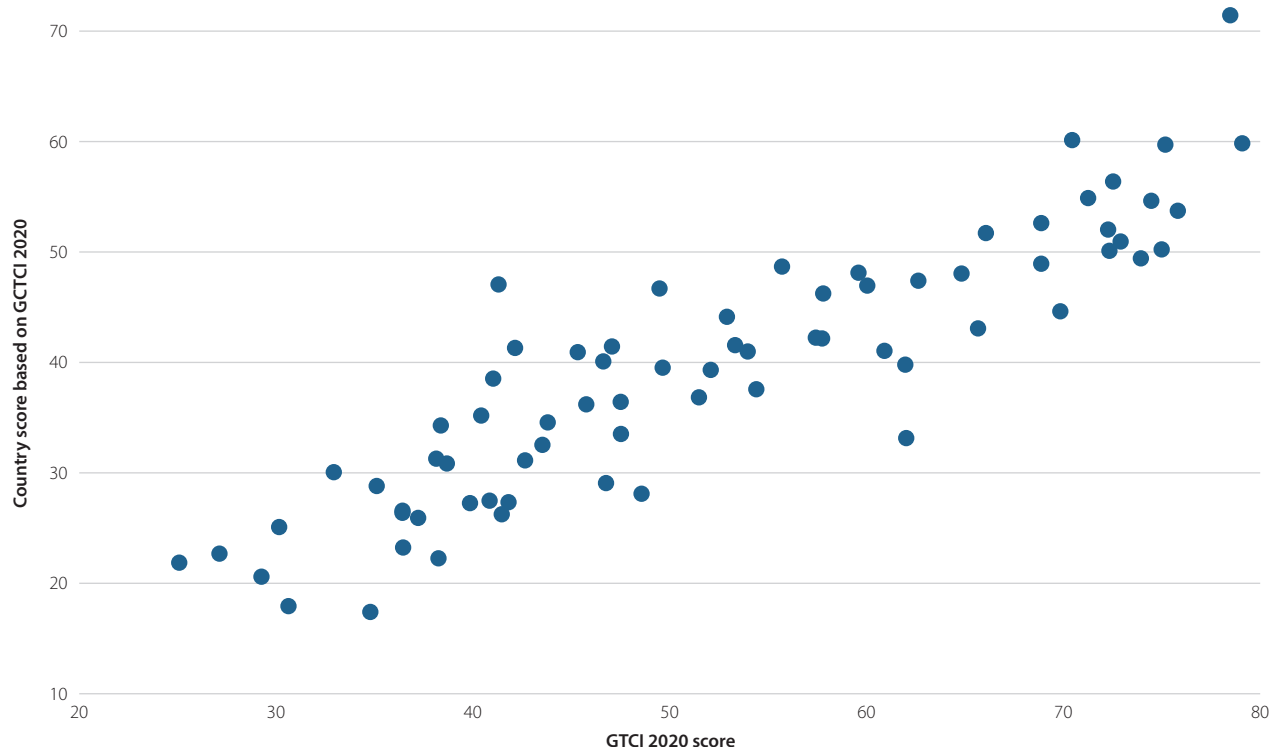
Yet, on the whole, the differences between this year's rankings and those of last year should not be exaggerated. Both rankings are highly correlated with each other and the regional locations of the cities in the various quartiles follow very similar patterns. Thus, the top quartile of GCTCI 2020 (i.e., those ranked 39th or better) includes 15 cities in Europe, 15 in Northern America, 7 in Eastern and Southeastern Asia, and 2 in Australia. All cities but two are located in high-income countries. The two exceptions—Shanghai (32nd) and Beijing (35th)—mean that China is represented in the top quartile of the GCTCI for the first time.

The third quartile (cities ranked between 40th and 78th) is only slightly more diverse. The majority of the cities are in Europe (23 in total), with the rest located in Eastern and Southeastern Asia (8), Western Asia (3), Oceania (2), Northern America (2), and Southern Asia (1). Again, most cities are found in high-income countries (32 out of the 39 cities). Six cities are based in upper-middle-income countries (including three in mainland China). The sole city from a lower-middle-income country—Bengaluru (66th)—is the highest-ranked Indian city in the index.

The second quartile (cities ranked between 79th and 117th) is where the highest-ranked cities from Latin America can be found: Sao Paulo (84th), Santiago (87th), and Buenos Aires (88th). The quartile is more diverse, albeit Europe still dominates (19 cities). The remaining cities are situated in Eastern and Southeastern Asia (11), Latin America (4), Western Asia (3), and Southern Asia (2, both from India). As for income groups, 19 cities are in high-income countries, 15 cities are in upper-middle-income countries, and 5 cities are in lower-middle-income countries.

The highest-ranked African cities—the two Northern African (Moroccan) cities of Casablanca (123rd) and Rabat (129th) and Sub-Saharan Cape Town (134th)—are found only in the bottom quartile (cities ranked 118th or worse). The quartile contrasts significantly from the other three quartiles in that it features only four European cities. Instead, most cities are situated in

Figure 4

Derived country scores from GCTCI vs GTCI scores

Sub-Saharan Africa (8), with the rest in Latin America (7), Eastern and Southeastern Asia (6th), Southern Asia (6), Northern Africa (4), and Western Asia (3). Most cities are found in lower-middle-income countries (20) and upper-middle-income countries (14). In addition, there are three cities in high-income countries and one in a low-income country (Addis Ababa, 150th).

One of the key messages discussed in last year's report was that there are complementarities across the pillars whereby different dimensions of talent competitiveness mutually reinforce one another. This is still the case, as can be seen by observing how frequently top-performing cities feature in the top 10 in each pillar (Table 2). For instance, New York makes it into the top 10 in four of the five pillars and London and San Francisco are ranked in the top 10 in three of them. By the same token, seven of the top 10 cities in the overall GCTCI rankings are in the top 10 in the Attract pillar, while there are several of them also in the Global Knowledge Skills (6), Enable (5), and Grow (4) pillars. Retain is the one pillar that stands out in this regard, as it does not include a single city that is also in the top 10 overall.

It will not have escaped the reader that the top-performing cities in the GCTCI are located in countries that have high ranks in the GTCI. That there are no fewer than four US cities in the top 10 of the city index is in line with the 2nd position of the United States in the country index. Similarly, Singapore is in the top 3 in both rankings. In view of this—and that a better GCTCI rank seems to be associated with a higher income level—one would

expect there to be a link between performances in the two indices. Figure 4 corroborates such a connection by plotting country scores derived from the GCTCI against GTCI scores. The former scores are estimated by computing average city scores by country. The figure clearly shows that cities that do well in the GCTCI tend to be located in countries that do well in the GTCI ($p = 0.90$). From a methodological viewpoint this is encouraging, as it lends credence to the GCTCI model and, at the same time, shows the value-added of the city index.

Details about the GCTCI rankings overall and by variable are presented in Annex 2 at the end of the Special Section.

ENDNOTES

- 1 See Villani (2019).
- 2 For example, the index released in September 2019 by the Oliver Wyman Forum ranks 105 cities in terms of 'AI readiness': Singapore tops this ranking, and out of the top 20 cities, 14 are Asian, including Shenzhen, Beijing, and Guangzhou. See <https://www.oliverwymanforum.com/city-readiness/global-cities-ai-readiness-index-2019.html#>
- 3 On the way in which citizens perceive such development, see the recently launched Smart City Index, available at <https://www.imd.org/smart-city-observatory/smart-city-index/>
- 4 See Bris et al. (2019).
- 5 At the time when this report goes to print (late November 2019), Tesla just announced that they had chosen Berlin as the site of their new 'mega-factory' (<https://www.nytimes.com/2019/11/13/business/tesla-elon-musk-berlin.html>), while Audi confirmed plans to shed some 9,500 jobs by 2025 as a result of its continued transition towards electric cars

(<https://www.dw.com/en/german-carmaker-audi-to-slash-9500-jobs-by-2025/a-51424743>). Strategies in the automobile sector are clearly a sector in which skills, talent, and city-based consideration are key.

- 6 The relatively weak performances of US cities in the Retain pillar is similar to the way they fare in The Global Liveability Index produced by The Economist Intelligence Unit (<http://www.eiu.com/topic/liveability>).
- 7 A complete list of sources is provided in Annex 1 at the end of the Special Section.
- 8 As underlined in the Cities Section of the GTCI 2017, the definition of what constitutes a *city* is obviously a critical element here. To an extent, this is guided by data availability, with some data available only at the metropolitan or regional level. The general approach in the GTCI this year is to primarily define cities at the level of the municipality. However, for those indicators where larger urban areas are more appropriate (e.g., on the number of airport passengers for indicator 5.3 Airport connectivity), the metropolitan area is treated instead.

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CHAPTER 8

How Cities Use AI to Be Talent Competitive: The Example of Bilbao

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Bizkaia Talent

Despite being something that seems distant and futuristic, Artificial Intelligence (AI) is already among us. And it is here not only to change the ways we perform in certain sectors of activity, but also to revolutionise the reality of the cities in which we live. Since recruitment and performance evaluation have been radically affected by AI, it is necessary to analyse which jobs and skills are the most exposed to competition from it. Consequently, a re-evaluation of workplace practices and corporate structures will be needed. Based on Bilbao and the Basque Country, this chapter sets out to do precisely that—to present in a few strokes some concrete projects making use of AI, and to explain how this is generating different talent needs from those that have existed until now and how a territory can respond to the needs that this new reality brings.

THE CITY'S TRANSFORMATION AND TALENT PROJECTS

The city of Bilbao in the Basque Country is an example of self-reinvention. If 20 years ago the first big step of the city's

rejuvenation came from the 'Guggenheim Effect',¹ which made it possible to transform itself from a grey industrial city into a cultural and service-based one—a clear example of this is that Airbnb has placed Bilbao in second place worldwide out of 20 places to visit in 2020²—then the concentration of innovative digital services aimed at industry will lead the city's future path. Two main projects will lead this transformation.

First, the International Entrepreneurship Centre, slated to open in mid-2020 in the renewed Bizkaia Tower,³ was conceived as 'one of the best-connected entrepreneurship hubs in the world to become an entrepreneurship reference in Southern Europe' as part of the Biscay Startup Bay strategy.⁴ This entrepreneurship hub aspires to be one of the most powerful innovation and entrepreneurship ecosystems in the world. It will be focused on three vertical accelerators (energy, mobility, and food tech—all strategic sectors that are part of the DNA of the Basque Country) and two horizontal accelerators (deep learning and blockchain, which clearly address two of the exponential technologies that will shape the future).

The second is the Zorrotzaurre project.⁵ This once heavy industrial peninsula will be converted into a knowledge island and will become a hot spot for attracting talent thanks to its universities, professional training schools, affordable housing, environmentally friendly business areas, and social and cultural installations, as well as spacious green areas available for people's enjoyment.

It is already well known that the competition for the best global talent is nowadays led by some medium and big cities or metropolitan areas.⁶ These all share common points, including well-ranked universities, numerous international companies, an active start-up scene, good international connections, high-quality public services, and high safety rates. Finally, tourism, foreign investment, and talent management are each part of the triangle needed for a successful place branding, so having a strategy that connects these three axes is a must. The Basque Country, with Bilbao at its head, is betting on adding inclusive prosperity as another ingredient to that formula,⁷ seeing it as the key solution to a well-distributed economic wealth that drives talent attraction and retention—the main players of innovative ecosystems.

In fact, the regional start-up and innovation ecosystem in general, and the International Entrepreneurship Centre in particular, will be the new focus point in an area that is looking towards being the reference in the Atlantic axis in Southern Europe to attract the best talent—not only for the start-ups, but also for small and medium enterprises (SMEs) and big companies that will take advantage of the open innovation emerging from this hub.⁸

From Start-Ups to Big Corporations, AI Has Come to Stay

In pursuing these projects, the city of Bilbao has several key areas in mind. One of them is AI. Sherpa.ai,⁹ the leading AI-based conversational and predictive digital assistant, is probably the best example of how this sector is evolving in the Bilbao area. According to Fortune,¹⁰ Sherpa.ai is *'one of the leading Artificial Intelligence companies globally.'* This Basque company, with offices also in Silicon Valley, is endorsed by the AI Breakthrough Awards 2019, which designated it the best intelligent personal assistant. But, of course, a company cannot reach those excellence levels without the best talent within its ranks. The company, led by its founder and CEO Xabier Uribe-Etxebarria, has surrounded itself with a team of experts and advisors. Among them, for instance, is the co-founder and former CTO of Siri, Tom Gruber,¹¹ who has recently been hired with exclusivity when it comes to AI Strategic Advising after working for Apple for the last eight years.

Other interesting examples of what is brewing in the Basque start-up field can be seen in AI.Power,¹² a start-up producer for talented entrepreneurial people who create disruptive solutions to problems by applying AI and deep tech; in Finanzhub, which is a company that is undergoing all the R&D and technological development for an automated portfolio manager that invests in investment funds using AI;¹³ and in the disruptive start-up Tormesh,¹⁴ which for its part is transforming the internet of

things (IoT) scenario. Focused on wireless communications efficiency, Tormesh enables individuals to join together to build a community-owned, decentralised, secure, robust, and affordable network that makes it possible for low-power machines to transfer data across long distances. In yet another example, TAD – The Art of Discovery,¹⁵ is a drug discovery company committed to discovering medicines to treat ageing and catastrophic human diseases by in vivo PK/PD screening of drugs in humanised mouse models (mice transplanted with human tissue).¹⁶ The company, which has been supported by the Bill & Melinda Gates Foundation because of its work on the development of new medicines for malaria eradication, is currently developing a project together with the Medicines for Malaria Venture, where AI is essential for testing the efficacy of new combinations of anti-malarials to prevent the development of resistance in the clinic. Another example is WorldPats¹⁷—a platform and associated application that, within the framework of a business-to-business-to-customer (B2B2C) model, improves the whole experience of expatriates having to move to a new city. Once in the country, workers have in the app all the updated information related to their new destination (useful information about the city, health insurance coverage, expatriate forums of the same nationality, events of interest, etc.), a 24/7 virtual concierge service and, depending on the contracted license, even a physical concierge.

But it is not only the entrepreneurial projects that are setting the pace. Larger companies are also betting hard. One of the most graphic examples of how synergies are being sought and potentialities are being exploited is the entry in May 2016 of the wind turbine manufacturer Gamesa—now SiemensGamesa—into NEM Solutions' capital,¹⁸ a Basque company with offices in Philadelphia (United States) and Coventry (United Kingdom), which develops technological applications for predictive maintenance management in the wind and rail sector. NEM Solutions, awarded in 2017 as the most innovative company by the Global Brands Magazine,¹⁹ has its own analytical technology and platform named AURA, recognised in the mobility and energy markets as a highly sophisticated technology in terms of anticipating failures and business control. It is noteworthy that its greatest innovation compared to its competitors, even above the level of its highly advanced products, is in the business model.

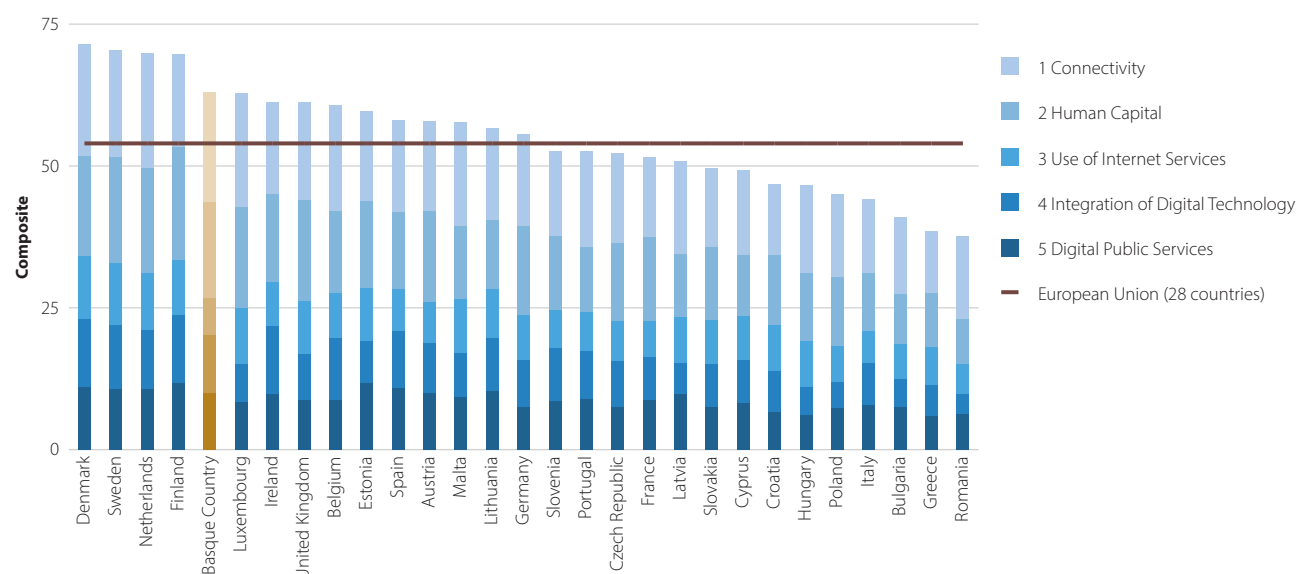
AI Supporting the Place Branding Strategy

As noted earlier, tourism plays a key role within place branding. In this context, Bilbao is immersed in a 6-million-euro project co-financed by the European Fund for Regional Development called *BIOTIP-Smart Tourism* that will end by October 2021. The project aims to use big data analysis and AI when it comes to advising and supporting the growing number of tourists in the city.²⁰

The BIOTIP-Smart Tourism project will implement actions such as replacing more than 500 antennas with last-generation ones, expanding the municipal optical fibre network, installing new Wi-Fi access points,²¹ implementing a virtual assistant, and generating relevant tourist digital content.

This platform will analyse the behaviour of each individual visitor—who wants to use the tool—and will propose to him

Figure 1
DESI breakdown, 2018



Source: Based on the figure prepared by Orkestra – Basque Institute for Competitiveness, based on Eurostat, Instituto Nacional de Estadística (INE, the Spanish statistics official institute), Eustat (the Basque Statistical Institute), and Comision Nacional del Mercado de la Competencia (CNMC, the national commission for market competitiveness), updated 10 December 2018.

Note: The Digital Economy and Society Index (DESI) is a European index produced by the European Commission; see <https://ec.europa.eu/digital-single-market/en/desi>

or her a personalised and memorable experience, not only in the city itself but also throughout the Basque area. The project, whose goal is to increase the number of overnight stays in the region, will help position Bilbao at the forefront of the use of exponential technologies aimed at the tourist experience. It will also facilitate showing visitors the flavour of the 'South of the North, North of the South'²²—that is, it will demonstrate the region's similarities with the Nordic countries in many indicators of well-being and social policies in spite of its location in Southern Europe.

As a whole, the Basque Country presents a level of convergence towards European leaders, mainly due to its high connectivity capabilities, to the level of human capital, and to the more than satisfactory level of integration of technology in business and public administrations (Figure 1).

THE BASQUE LABOUR MARKET AND THE TALENT THAT WILL BE REQUIRED IN THE FUTURE

In the GTCI 2015–16,²³ projections of supply and demand of university graduates that the Basque Country would face were presented. Figure 2 analyses more adjusted data and forecasts regarding the level of fit of university graduates (the percentage of university graduates working in highly qualified employments). As can be observed, we are currently at the highest level of fit in history.

In addition, it is worth mentioning that, according to Bizkaia Talent's forecasts, in 2018 there would be 932,000 people employed in the Basque Country (the definitive data had not yet been published at the time of the forecast shown in Table 1),

while—even in a not-very-probable conservative scenario—only 916,400 would be employed by 2022. The interesting thing is that, in this scenario where 16,000 jobs would disappear, it is estimated that 19,000 would be created for university graduates (331,760 in 2018 and 350,940 in 2022), which would really be around 24,000 on the basis of the level of the market fit (278,570 in 2022 compared to 254,450 in 2018). The question becomes, should we really be afraid of the arrival of these new technologies or should we start designing an effective strategy on how to re-skill the low-skilled population as well as the professionals exposed to competition from AI, for example?

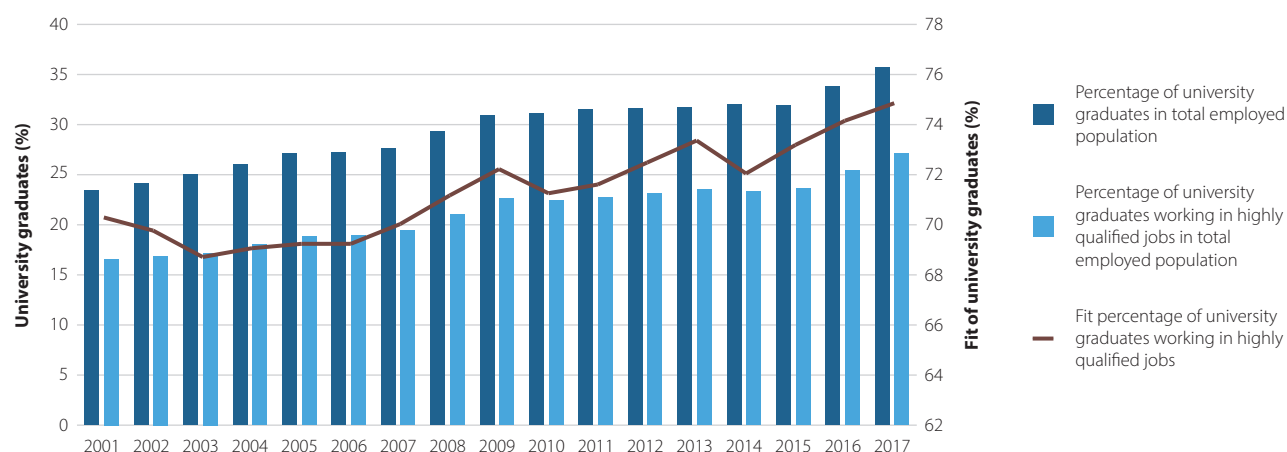
Adaptive Talent Is the Key

The Organisation for Economic Co-operation and Development (OECD) estimated that about 14% of jobs in the OECD area as a whole are at risk of automation, while another 32% are likely to experience significant changes.²⁴

Currently, like most of the companies noted in the first section, organisations, regardless of size, are looking mainly for AI experts, analysts and data processors, mathematicians, software developers, those with knowledge of the main techniques of machine learning, and so on.

Local training centres and universities are beginning to react to this reality. For example, the University of the Basque Country will implement the first bachelor's degree in Artificial Intelligence at the Spanish state level in the 2020–2021 academic year (until now only a master's degree has been offered in that field). Students will be trained in issues such as engineering and data science, as well as robotics, optimisation, and expert systems, among others. This is connected to the STEAM Euskadi

Figure 2

Level of fit of employed university graduates, Basque Country

Source: Authors' elaboration based on data from the Labour Market Census and population survey related to the activity, Eustat – the Basque Statistical Institute, available at http://en.eustat.eus/estadisticas/tema_58/opt_1/tipo_3/temas.html and http://en.eustat.eus/estadisticas/tema_57/opt_1/temas.html

Note: Although smoothly, the level of fit has grown over the past 17 years. In 2017, 75.1% of the graduates are in categories 1, 2, and 3 of the European Skills, Competences, Qualifications and Occupations (ESCO) multilingual classification. Level 1, Managers, is the highest classification; Level 2 is Technicians; Level 3 is Professionals.

strategy to promote scientific-technical education and training in all educational stages, involving socioeconomic agents for this purpose. It inspires vocation and vocational aspirations in the STEM field, with special attention to female students, to adequately prepare them for future challenges and promote dissemination and scientific-technological culture among Basque citizens.²⁵

It is undisputed that we find ourselves in uncertain times, where thousands of new positions that did not exist before are, and will continue, showing up. This means that, in many cases, years of experience will no longer be an advantage.

This is the main reason why, beyond technical knowledge, we must focus on the development of *adaptive talent*—skills that are exclusively human and that, in short, will be the ones that make a difference when it comes to *'seeing... problems and opportunities... but more importantly addressing those opportunities to create value'*.²⁶ In this sense, we are able to identify highly valuable issues in which machines cannot replace people and in which, most probably, machines will never be able to substitute as they are intrinsically human issues such as creativity, curiosity, enthusiasm, leadership, empathy, or compassion.

BIZKAIA TALENT'S APPROACH TO AI AND NEW TECHNOLOGIES

Everything we have seen so far must also be accompanied by a talent management strategy at any territorial level. It is precisely at this scope that Bizkaia Talent—a private non-profit association—has been working for almost 15 years to provide innovative solutions to make the Basque Country a talent hub under the inclusive slogan 'Be Basque'.²⁷

In 2015, Bizkaia Talent had around 4,000 professionals in its database. However, the work team was not, nor is it still,

numerous. This fact, together with its ambition to advance and be in the global forefront of regional talent management, made clear the need to introduce new technologies in order to expand the spectrum of its activity.

In 2015, the Basque Talent Map was launched. Much more than a simple heatmap, it allows any professional organisation to carry out personalised searches through a series of filters. Currently the Map gathers over 13,000 professionals located in over 100 countries all over the world, together with more than 400 Basque companies.

Then a homemade matchmaking tool was developed. Specific algorithms allow the Bizkaia Talent association to match the professionals and organisations attending its events. The results of the matchmaking tool review the personalised agendas of the attendants, helping the association to trigger more efficient networking opportunities.

After the matchmaking tool was implemented, Bizkaia Talent got immersed in big data analysis thanks to the Basque Talent Observatory (BTO) launched in 2017, which made a real breakthrough. By semantically analysing hundreds of thousands of job offers, it provides strategic information for professionals, companies, and universities about the hard and soft skills demanded by the regional labour market. In this way, the BTO makes it possible to screen and cross data related to occupations, skills, and sectors needed in the Basque Country for highly qualified professionals.

CLEAR COMMITMENT TO EXPONENTIAL TECHNOLOGIES: FROM BIG DATA TO AI, MACHINE LEARNING, AND HUMAN BEHAVIOUR

The use of these technologies has allowed the Bizkaia Talent association to advance faster in its mission and even beyond.

Table 1

Forecast of numbers of employed people, ESCO levels 1, 2, 3, and university graduates in the Basque Country, conservative scenario

YEAR	TOTAL EMPLOYED POPULATION	POPULATION WITH A UNIVERSITY DEGREE OUT OF TOTAL EMPLOYED POPULATION	TOTAL POPULATION WITH A UNIVERSITY DEGREE EMPLOYED IN ESCO 1, 2, OR 3
2001	859,200	201,420	142,400
2002	902,200	217,860	152,710
2003	915,200	228,440	157,480
2004*	930,600	242,010	167,750
2005	945,200	255,700	177,690
2006	962,100	261,800	182,010
2007	977,700	270,060	190,100
2008*	986,100	288,650	206,900
2009	946,600	292,720	213,510
2010	937,800	291,880	209,680
2011	925,000	291,050	210,120
2012*	898,400	283,690	207,590
2013	884,300	280,240	207,940
2014	880,600	281,880	204,950
2015	892,900	285,280	211,130
2016*	903,300	305,520	229,370
2017	918,200	327,750	248,800
2018**	932,900	331,760	254,450
2019**	928,300	336,480	260,950
2020**	922,900	340,830	267,060
2021**	919,200	345,750	272,770
2022**	916,400	350,940	278,570

Source: Authors' elaboration based on data from the Labour Market Census and population survey related to the activity, Eustat- the Basque Statistical Institute, http://en.eustat.eus/estadisticas/tema_58/opt_1/tipo_3/temas.html and http://en.eustat.eus/estadisticas/tema_57/opt_1/temas.html

Note: * = interpolated; ** = estimated. ESCO = the multilingual classification of European Skills, Competences, Qualifications and Occupations; Level 1 is Managers, Level 2 is Technicians, Level 3 is Professionals.

These technologies have served to leverage many other tools based on AI, such as the ones listed below:

- *Kids&Skills* is a brand-new digital platform for the scientific analysis of specific transversal skills for 11-year-old schoolchildren, developed along with Lauaxeta Ikastola, one of the most innovative schools in the Spanish state, which has included this platform in their school curriculum.²⁸
- By combining the data analysed by the Basque Talent Observatory with the CVs of the global talents, the *Career Development Centre* gives professionals personalised advice about how they could develop professionally and be more attractive for companies, or what skills they would need.²⁹ It provides the ability to predict the need of talent according to the sector and academic background,
- suggesting an automatic matching with companies that are looking for those skills. It also provides information on the range of salaries according to occupation level in the Basque Country and compares the Basque region to any other EU region or OECD country according to well-being variables. In the end, this tool claims to increase the potential links with Basque companies so that professionals can consider the region to be the best place to work and live.
- Regarding companies, the recently launched *Headhunting Support Centre* (HSC) supports Basque organisations in the work of finding the right talent for them according to their specific needs.³⁰ Companies can consult the skills that are being requested in each of their activity sectors, so they can compare them with their own needs and then access the right professionals who would be a good fit for their

future challenges. The HSC also has a super-fast searching database capable of making complex searches in milliseconds. All in all, the speed provided by AI increases the probability of a successful match between professionals and organisations.

Moreover, this system will soon create groups of interest according to the behavioural trends of the professionals in the database. This will represent a great improvement as it will provide much more accurate matchings between companies and professionals than if a 'simple' data analysis is used. This platform also provides strategic information about salaries, standards of living, and taxation issues to the Basque organisations.

- As noted earlier, a re-evaluation of workplace practices and corporate structures will be needed because AI will disrupt the traditional human resources processes. So, more than ever, companies and society as a whole will seek the uniquely human skills, the new—and permanent—gold.
- In the near future, Bizkaia Talent's *Be Basque Employer Branding Centre* will be developed to respond to this demand. The underlying idea is to help Basque organisations improve their talent attraction and retention policies by analysing their (potential) employees' perceptions and expectations.

LOOKING FORWARD: CITIES AND AI TO BENEFIT HUMANS

In Bilbao, steps are being taken in technology centres, companies, universities, and some start-ups to develop projects and explore ways to correctly integrate AI into their usual practices, but there is still a long way to go. In general, more business-oriented AI products must be created. On the other hand, it seems important to design an environment where all these stakeholders working in the field of AI can share experiences and knowledge, because it seems logical to think that joining them will bring competitive advantages.

Open innovation will be key for the competitiveness of industry and therefore of regions. Setting up a comprehensive plan that aligns the Basque Industry 4.0 Industry strategy together with the International Entrepreneurship Centre in the city of Bilbao, supported by the 'Be Basque' strategy as the catalyst of talent attraction and development, is a major issue.³¹ Equally, in the next era of human-machine partnership, orchestration between the human touch and AI will be decisive, maximising technology as the tool that exponentially amplifies creativity, inspiration, intelligence, and curiosity.

Taking into account that industrial activity represents 24.2% of the Basque GDP,³² and that the Basque automotive supply industry represents more than 50% of the sector in Spain (which is the second automaker country in Europe), various institutions—such as the Basque government and the Basque business development agency SPRI³³—have shown interest in extending

business measures that can accelerate the fulfilment of the United Nations (UN) Sustainable Development Goals, as well as establish mechanisms for measuring the indicators associated with these objectives.

Related to this, the United Nations, through the forthcoming UNIDO 2020 report,³⁴ will examine the future of manufacturing production and the impact that new technologies linked to industry 4.0 are having on the industrialisation process of the more developed countries. A chapter of that report will specifically focus on the Basque Country because it has a strategy of interest to the UN, and it can serve as an example to be implemented in other countries.³⁵

Finally, we must not forget that normally the most far-reaching challenges tend to turn into the most extraordinary opportunities. Along the same lines, it will probably not be so much about preventing or regulating technology as such, but rather about becoming better managers of the human kind, being clear about why and for what we want to develop certain technologies, and, above all, about ensuring the ethical foundations as well as the necessary underlying regulations and legal framework of our society. In other words, we must make sure that any future development contributes to building a more just and inclusive society.

ENDNOTES

- 1 More information about the Guggenheim Effect can be found at <http://www.mascontext.com/issues/30-31-bilbao/the-many-effects-of-the-guggenheim-effect/>
- 2 Bilbao came in second place worldwide among Airbnb's 20 destinations to visit in 2020; see Airbnb Newsroom, available at <https://news.airbnb.com/20-for-2020/>
- 3 The Bizkaia Tower, formerly the Banco de Vizcaya Tower and later the Torre BBVA Tower, is a building located in the city centre of Bilbao. Designed by architects Enrique Casanueva, Jaime Torres, and José María Chapa, its inauguration took place on 22 April 1969. At 88 metres, it has 21 floors. After its construction, it was the tallest building in the city until the construction of the Iberdrola Tower (165 metres) in 2009.
- 4 See the official website of the Provincial Government of Biscay at <http://web.bizkaia.eus/es/web/area-de-prensa/noticias/-/news/detailView/19174> [authors' translation].
- 5 The Zorrotzaurre project is the latest major urban regeneration project to be implemented in Bilbao. Zorrotzaurre is an area that has shown constant social and industrial decline since the 1970s; today, scarcely 500 people live there. The Zorrotzaurre project is an integral and sustainable plan to recover a currently derelict site and convert it into a new quarter that is well connected to the rest of the city, with affordable housing, environmentally friendly business areas, and social and cultural installations as well as spacious green areas for people's enjoyment. The Master Plan for the project was designed by the prestigious architect Zaha Hadid. It includes the conversion of the current Zorrotzaurre peninsula into an island by opening up the Deusto Canal—an island for living, working, and pleasure. For further details, see <http://www.zorrotzaurre.com/en/>
- 6 Although a big city's size continues to come with many advantages in terms of jobs and connectivity, these advantages are partially outweighed by the ability of higher-level talents to operate from smaller locations, provided that those locations are not synonymous with isolation: Physical and technical connectivity (transportation and communications) contribute to mitigate this traditional disadvantage of smaller cities, where quality of life is often seen as higher than in environmentally challenged metropolises. See Lanvin & Evans (2016).

- 7 Bilbao is the main city and metropolitan area of the Basque Country, which is the region with the best quality of life (both in Spain and compared to the countries in the Organisation for Economic Co-operation and Development, or OECD) according to different indices (see <https://www.oecdregionalwellbeing.org/>). It has a low unemployment rate and the highest salaries, a high productivity rate (<https://www.ine.es>), and is considered the most innovative and ranked at the top of the Social Progress Index (https://ec.europa.eu/regional_policy/en/information/maps/social_progress) thanks also to its top position when it comes to social differences (Gini Index, <https://www.census.gov/topics/income-poverty/income-inequality/about/metrics/gini-index.html>). Everything based in the inclusive prosperity strategy can be distilled in the slogan 'North of the South, South of the North'—a slogan that highlights the region's similarities with Nordic countries in many of the aforementioned indicators and social policies together with a good combination with a southern Europe lifestyle.
- 8 Bilbao has jumped 121 positions since 2017—the third largest progression among all European Union cities in the Startup Ecosystem Ranking. See <https://report.startupblink.com/>
- 9 Further information about Sherpa.ai can be found at <https://sherpa.ai/>
- 10 Rapp & O'Keefe (2018).
- 11 Tom Gruber is a researcher, designer, and entrepreneur with a focus on technology to augment human intelligence. He was cofounder, CTO, and VP Design for Siri, which created the first intelligent assistant for everyone. A conversation about conversational AI is available at <https://tomgruber.org/>
- 12 Further information about AiPower is available at <http://aipower.ai/>
- 13 Finanzhub is a start-up created by the Madrid-based company Finanzbest, which will deal with the R&D and technological development of the group from the Basque Country.
- 14 Further information about Tormesh is available at <https://tormesh.com/>
- 15 The company has already defined a new project to combine AI with previous experimental tests of drugs and vaccines in humanised mice in order to predict the efficacy of new treatments and vaccines in human clinical trials. See <https://www.theartofdiscoverysl.com/> for further details.
- 16 PK/PD is a technique that combines the two classical pharmacologic disciplines of pharmacokinetics and pharmacodynamics.
- 17 Further information about WorldPats is available at <https://worldpats.com/>
- 18 Further information about NEM Solutions is available at <https://www.nemsolutions.com>
- 19 NEM Solutions was selected as the most innovative company in Europe 2017 in the Technology Awards category for its unique commitment to an innovative culture and in continuous development since 2007. The jury has determined that its products are unique and take innovation to the business model itself in comparison to similar companies. Innovation, quality, unique and memorable projects, proven reliability with the clients consulted, and a strong commitment to the values of the company are the aspects that have been highlighted by the jury, together with inspiration and care for the needs of the staff since the beginning of the company.
- 20 Last year the city received almost 1 million visitors and figures are increasing year by year (<http://www.bilbaoturismo.net/BilbaoTurismo/en/comunicados-de-prensa?idNoticia=1364335422942&anio=2019&pagina=1>, in Spanish). The city also came in second at the European Best Destination Award 2018 (see <https://www.europeanbestdestinations.com/european-best-destinations-2018/>) and was named European City of the Year at the 2018 Urbanism Awards (see Academy of Urbanism, 2017).
- 21 It must be taken into consideration that the Wi-Fi system of Bilbao is the most used one in Spain, with more than 120,000 unique users every day; 20,000 of them are university students connected through a network of more than 1,400 antennas (half of them owned by the municipality).
- 22 This claim is used to reinforce the branding of the Basque Country as the region with one of the best quality-of-life rankings according to the different indices (both in Spain and by the OECD), with a lower unemployment rate and the highest salaries and productivity; it is ranked as the most innovative and at the top of the social development index thanks also the top position when it comes to social differences (GINI Index), everything based in Inclusive Prosperity Society; see <https://www.oecdregionalwellbeing.org/ES21.html>
- 23 Supply and demand projections for the 2015–2020 period showed that, despite initial surpluses of tertiary educated people, the number of university graduates entering the labour force will be lower than needed to cover demand. See Lagunilla & Jiménez (2015).
- 24 OECD (2018).
- 25 For further details about the STEAM Euskadi strategy, see <http://steam.eus/es/estrategia-euskadi/>
- 26 Hagel (2019); see https://www.youtube.com/watch?time_continue=2&v=a7yb-sbKT_I at 2:45.
- 27 The 'Bilbao Bizkaia, Be Basque' brand was launched in 2013 by the City Council of Bilbao and the Country Council of Biscay. Its main objective is to promote a positive, coherent, and stable image of the territory—within the framework of a comprehensive strategy that is key for attracting visitors, investments, events, and talent. See Lanvin & Evans (2017).
- 28 For details about Kids&Skills, see <https://kidsandskills.eus>
- 29 More information about the Career Development Centre can be found at <https://www.bizkaiaalent.eus/en/te-ofrecemos/career-development-centre/>
- 30 For more details, see <https://www.bizkaiaalent.eus/en/te-ofrecemos/headhunting-support-centre/>
- 31 Further information about the Basque Industry 4.0 Industry strategy can be found at <https://basqueindustry.spri.eus/en/>
- 32 The goal set for 2020 is that industry will provide 25% of GDP; in May 2018 the data confirmed that 24.2% had been reached, while in 2016 the sector represented 23.9%. For more details, see <http://www.euskadi.eus/noticia/2018/tapia-el-peso-de-la-industria-en-euskadi-alcanza-ya-el-24-2/web01-s2ekono/es/>
- 33 Information about SPRI can be found at <https://www.spri.eus/en/>
- 34 The forthcoming United Nations Industrial Development Organization (UNIDO) 2020 report will identify as good practice the Basque Industry 4.0 strategy of the Basque government. See Grupo SPRI (2019) at <https://www.spri.eus/es/basque-industry-comunicacion/unido-organismo-industrial-de-la-onu-elige-la-estrategia-basque-industry-4-0-como-practica-recomendable-para-el-desarrollo-industrial/>
- 35 Public-private collaboration is the basis of the Basque Industry 4.0.

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A SPECIAL GTCI INTERVIEW

Porsche, AI, and Talent: Why Berlin Rather Than Stuttgart?

An interview with Anja Hendel

Director, Porsche Digital Lab

The competition among cities to attract investment through talent and to enhance their own talent competitiveness is well illustrated by the choice made by Porsche to set up its Digital Lab in Berlin, rather than in Stuttgart, where the company's headquarters are located.



Since 2017, Anja Hendel has been Director of Innovation Management and Digital Transformation for Finance at Porsche AG. She also works alongside Dr Mahdi Manesh to head up the Porsche Digital Lab in Berlin. This technical laboratory is a platform for collaborating with technology companies, start-ups, and scientific institutions, and it deals with the practical application of concepts such as blockchain, Artificial Intelligence (AI), and the internet of things at Porsche. In October 2019 Anja Hendel was interviewed by the GTCI team, responding to questions about talent competitiveness and the impact of AI on a company like Porsche in particular, and the automobile sector in general.

Porsche Headquarters have always been in Stuttgart. What was so attractive in Berlin's talent pool that Porsche decided to establish its Digital Lab there?

Anja Hendel:

As an organisation, we were struggling to get well-qualified people for IT [information technology], since Stuttgart is filled with organisations from a lot of different industries and has a high demand. We therefore started to look for another location; and in terms of this we decided that Berlin was very interesting especially for tech talents as it is a renowned, attractive, and cosmopolitan city.

Furthermore, talents are primarily interested in exciting work, excellent teamwork, and the opportunity to learn, so we decided to build with our location a platform that offers all of these aspects. We want to attract international people with skills everyone uses now (i.e., GAFA [Google Amazon Facebook Alibaba]) and of course, we have to deal with a fierce competition.

Having attracted global talent to its own innovation laboratory, how did Porsche translate that into gearing its innovations to big data, machine learning, cloud services, Industry 4.0, and the internet of things and turn those innovations into practical solutions?

Anja Hendel:

There are two main tasks when it comes to turning innovation into practical solutions, which is undeniably a challenging process. The first task is to inspire the Porsche organisation to determine what can be done through technology (e.g., using AI, business intelligence, quantum computing); the second one is to develop domains where experts can offer solutions to a given problem. For example, AI is currently being used in our lab to detect and analyse sounds—so engineers can make use of it by analysing the sound of a car door when it opens and closes and so to become aware of possible malfunctions. The later a problem is raised, the higher the cost to fix it, so it's really thanks to 24/7 machine detection work that the sound engineers can perform their work in a technology-facilitated way. We also have regular brainstorming sessions to identify what technology can do for our organisation.

What are the greatest talent challenges and hurdles a digital lab like yours is facing?

Anja Hendel:

In the beginning, the first challenge we had to face was indeed to bring people in and find them a first successful project. Another set of challenges relates to the 'outside world'. For instance, we don't control the price of housing in Berlin, so apartments can be expensive from time to time. Other challenges are how to diversify our workforce, and how to satisfy our new talents' need to learn continuously.

AI is not only about self-driven cars; it's also about keeping drivers (customers) connected, on schedule, and safe even when they are driving themselves. The value of AI in automotive manufacturing and cloud services will exceed US\$10.73 billion by 2024.* What opportunities do you see AI will offer in your industry?

Anja Hendel:

AI is one of the biggest opportunities for the automotive sector. I see that AI is changing everything, so it's important for us to look at the impact of this technology, though it might be hard

to foresee at times. I strongly believe that to shape the future we need, we first have to understand the technology and build organisations that adapt to new technologies as much as possible, while focusing on constant learning and aiming to develop permanently.

Another opportunity we see is in the following question: How can Porsche continue to develop new products using history, but combining its traditional heritage with innovative technologies? The answer is to effectively implement the best combination possible of the latest technologies with our branded traditions. That being said, the security and protection of our drivers and passengers are always our main priority.

Automation is provoking a rethinking of processes and production in radically new ways. More and more often, robots work with their human counterparts rather than just at their side. In your opinion, what will the talent impact of AI be in the automobile/transport sector? Do you see more jobs being created or—on the contrary—more skills becoming redundant?

Anja Hendel:

Automation is much more than just introducing more robots! We need to rethink the work of all sectors affected by AI. The work of machines and humans can—and should—be combined. We believe that automation will always be used to make things better and support the workers in making their tasks easier, hence improving the overall process. But we also believe that part of our comparative advantage will remain in the 'hand-crafted' dimension of our products. It's a matter of combining the resources of humans and those of machines in order to make the best of both worlds. Looking at the fourth industrial revolution, I would say that, so far, more jobs have been created than ever (not the other way around). It is an ongoing learning opportunity to expand the organisation and improve on our expertise. Growing companies like Porsche employ more and more workers, and technology is now an important ally—it certainly does not compete with engineers.

Worldwide, Porsche has now reached more than 32,000 employees and continues to grow fast. How does Porsche attract new talent?

Anja Hendel:

We at Porsche Digital opened a second location in the United States during the summer,[†] and we also have offices in Israel and China. A key motivation in choosing these locations has been

*See Novosilska, L. (2018). 5 ways artificial intelligence is impacting the automotive industry, *Ignite*, 30 November 2018, available at <https://igniteoutsourcing.com/automotive/artificial-intelligence-in-automotive-industry/>

†See Porsche Newsroom. (2019). Porsche Digital opens second location in the US, Press Release, 08 June 2019, available at <https://newsroom.porsche.com/en/2019/digital/porsche-digital-second-location-atlanta-georgia-cars-north-america-18306.html>

the availability of local talent. Globally speaking, attracting talent remains a key challenge for us, but we are well equipped to face it. First, we offer the possibility of growing within the organisation and developing new skills. Second, we understand that great people want to work on great projects, so we make our employees' responsibilities as interesting as possible. Last but not least, we promote mobility and offer different work locations such as those mentioned above. At Porsche, talents are now seeking more than an engineer role: they've broadened their research to the AI and ICT [information and communication technology] fields as well, and this means they're exploring more locations altogether.

Do you think that innovation and digital transformation require a human-centric approach? In other words, how can organisations produce, grow, and retain talent while the needs for AI and global competitiveness increase exponentially?

Anja Hendel:

The human factor is critical. AI should not only be human-centric [considering human skills and activities first] but also human-centred [focused on human well-being]. What's more, universities are no longer the only ones producing talent: It is now a lifelong commitment that needs to be offered and produced by employers as well. The quality of the work and the excitement for the company are also important to keep in mind as organisations develop and increase their workforce. It is believed that the automotive industry will change more in the next 5 years than it has in the last 50 years! This pivotal moment presents a great opportunity for companies to change and develop by using innovative technologies, including AI. As a successful company, we at Porsche need to work hard and focus on constant learning and opening new paths for our organisation to work moving forward. Also, we should ensure that the organisation welcomes change and is able to adapt quickly—and even anticipate the change to come.

Regulatory approval today is a critical step that must be in place before a company can put AI in the driver's seat. What legal and ethical issues do you foresee might arise (such as data protection and issues of liability and privacy, for example)?

Anja Hendel:

The role of regulators and ethics certainly needs to be addressed, and this is an area that has newly opened up. We need to pay close attention to what technology can do and what we need

to do with it—or what we need to leave alone. We now rely on experts who work on ethical topics and practical case studies that deal with aspects like this. We see this as a real opportunity to check where AI is being used intensely and ensure that, in such efforts, there is enough diversity to arrive at optimal decision-making.

Nevertheless, safety is still our number one priority. When it comes to ethics, sometimes there is no obvious right answer, so we're constantly challenging ourselves. Porsche needs to consider different levels, including a European level, to ensure consistency around a set of commonly accepted values.*

*Note from the GTCI team: This point is clearly aligned with the one made by Commissioner Nicolas Schmit about the importance of pursuing 'core values' in the age of global AI. See the Special GTCI Interview on AI and Talent Competitiveness: Luxembourg and the European Union with Nicolas Schmit in this report.

Annexes to the Special Section

Annex 1

Definition and sources of GCTCI variables

PILLAR	VARIABLE	SOURCE
Enable	1.1 GDP per capita, PPP (current international \$)	Eurostat, OECD, local and national statistics and studies, World Development Indicators, Euromonitor
	1.2 Internet speed (average megabits per second, Mbps)	Nomad List
	1.3 Ease of doing business	Ease of Doing Business Index (World Bank)
Attract	2.1 Presence of Forbes Global 2000 companies (HQ presence)	Forbes
	2.2 Foreign-born population (% of total)	Eurostat, American Community Survey, World Cities Culture Forum, New York City Global Partners database
	2.3 FDI projects (total)	fDi Markets, a service from the Financial Times Ltd
Grow	3.1 Major universities (average score of top universities—up to three universities)	QS World University Ranking 2020
	3.2 Tertiary enrolment (%)	Eurostat, American Community Survey, New York City Global Partners database
	3.3 FDI jobs created (total)	fDi Markets, a service from the Financial Times Ltd
Retain	4.1 Safety (homicide rate per 100,000 inhabitants)	United Nations Office on Drugs and Crime, UN-Habitat, Eurostat, FBI
	4.2 Environmental quality (annual mean of PM10 concentrations)	Ambient Air Quality Database, WHO, April 2018
	4.3 Traffic travel times	TomTom Traffic Index
	4.4 Affordability (purchasing power based on gross hourly pay)	UBS Global cities ranking 2018 complemented by Mercer 2019 Cost of Living City ranking
Global Knowledge Skills	5.1 Population with tertiary education (%)	Eurostat, local and national statistics, UNESCO UIS, New York City Global Partners database
	5.2 Patent applications (total)	Patentscope database (World Intellectual Property Organization)
	5.3 Airport connectivity (total number of passengers)	anna.aero, Airports Council International, national statistics

Note: FBI = Federal Bureau of Investigation (United States); FDI = foreign direct investment; OECD = Organisation for Economic Co-operation and Development; UNESCO UIS = UNESCO (United Nations Educational, Scientific and Cultural Organization) Institute for Statistics; WHO = World Health Organization.

Annex 2

GCTCI rankings and scores: Overall and by variable

Rank	City	GCTCI OVERALL	1. ENABLE			2. ATTRACT		
			1.1 GDP per capita	1.2 Internet speed	1.3 Ease of doing business	2.1 Presence of Forbes Global 2000 companies	2.2 Foreign-born population	2.3 FDI projects
1	New York	73.7	60.4	38.8	95.9	90.3	46.8	100.0
2	London	71.7	45.3	20.0	91.5	85.2	46.7	100.0
3	Singapore	71.4	67.5	100.0	98.5	57.0	37.1	100.0
4	San Francisco	68.1	72.8	53.8	92.8	81.3	42.4	50.0
5	Boston	66.8	62.8	50.0	92.8	55.7	35.4	40.7
6	Hong Kong	66.4	42.4	53.8	96.1	82.7	50.5	100.0
7	Paris	65.7	50.4	30.0	74.2	80.6	31.3	100.0
8	Tokyo	65.7	51.0	27.5	76.8	100.0	4.0	63.7
9	Los Angeles	62.8	54.5	33.8	88.1	57.0	47.3	52.0
10	Munich	61.9	57.8	31.3	81.7	48.2	34.4	57.4
11	Sydney	61.2	38.9	18.8	85.6	63.0	54.6	62.3
12	Toronto	60.2	36.1	36.3	81.4	61.2	59.9	42.2
13	Dublin	60.1	65.0	73.8	81.4	60.2	27.8	56.4
14	Chicago	60.0	50.0	38.8	92.8	73.2	25.3	54.4
15	Copenhagen	59.7	44.5	47.5	96.1	49.9	n/a	27.0
16	Seattle	59.6	61.8	32.5	92.8	48.2	24.9	26.0
17	Zurich	58.8	52.6	31.3	73.7	63.0	52.3	17.2
18	Stockholm	57.9	48.8	47.5	87.6	65.5	31.3	15.7
19	Houston	57.5	50.1	42.5	92.8	63.9	37.7	43.1
20	Amsterdam	57.3	45.7	23.8	72.4	48.2	37.2	58.8
21	Melbourne	56.8	29.1	16.3	85.6	49.9	43.2	46.6
22	Seoul	56.7	30.4	20.0	92.8	82.7	4.9	30.4
23	Atlanta	56.4	44.3	36.3	92.8	53.0	9.6	44.6
24	Madrid	56.4	35.1	35.0	77.1	54.4	26.7	58.3
25	Washington, DC	56.2	59.1	32.5	92.8	61.2	17.4	25.5
26	Dallas	56.1	48.7	41.3	92.8	63.9	31.3	37.7
27	Miami	55.9	38.0	32.5	92.8	49.9	73.7	34.3
28	Barcelona	55.8	30.7	46.3	74.2	39.1	30.6	55.9
29	Montreal	55.8	28.2	33.8	81.4	53.0	42.2	18.1
30	Vancouver	54.7	30.6	27.5	81.4	32.3	60.0	12.7
31	Helsinki	54.6	40.6	31.3	83.0	46.3	17.6	35.3
32	Shanghai	54.0	25.0	1.3	76.5	70.3	0.5	98.5
33	Denver	53.9	49.0	47.5	92.8	48.2	17.8	29.4
34	Geneva	53.9	55.8	41.3	73.7	36.0	73.3	9.8
35	Beijing	52.9	25.5	1.3	77.8	84.6	0.2	43.6
36	Vienna	52.6	39.1	46.3	79.1	39.1	40.9	20.6
37	Dusseldorf	52.2	51.9	28.8	81.7	39.1	37.8	43.6
38	Osaka	51.8	49.2	25.0	78.4	63.9	2.7	4.9
39	Berlin	51.7	29.9	32.5	81.7	27.8	18.3	52.9
40	Brussels	51.7	45.4	42.5	69.6	41.8	57.7	17.6
41	Milan	51.2	44.8	17.5	64.2	48.2	41.0	29.9
42	Philadelphia	51.1	51.0	43.8	92.8	57.0	18.5	15.2
43	Brisbane	51.1	29.5	17.5	85.6	22.0	n/a	13.2
44	Oslo	51.0	48.0	42.5	89.2	41.8	31.3	6.9
45	Edinburgh	50.9	36.4	23.8	91.5	22.0	26.4	14.7
46	Taipei	50.8	41.6	25.0	84.8	70.9	1.8	17.6
47	Warsaw	50.3	44.0	35.0	73.2	39.1	2.3	40.2
48	Gothenburg	49.6	34.9	40.0	87.6	27.8	33.1	3.4
49	Luxembourg	49.4	74.9	37.5	55.7	41.8	n/a	12.3
50	Hamburg	49.4	43.4	27.5	81.7	22.0	30.3	36.8
51	Dubai	49.3	42.5	10.0	84.8	36.0	n/a	100.0
52	Ottawa	48.8	32.3	27.5	81.4	0.0	27.8	3.9

3. GROW			4. RETAIN				5. GLOBAL KNOWLEDGE SKILLS		
3.1 Major universities	3.2 Tertiary enrolment	3.3 FDI jobs created	4.1 Safety	4.2 Environmental quality	4.3 Traffic travel times	4.4 Affordability	5.1 Tertiary educated population	5.2 Patent applications	5.3 Airport connectivity
99.3	28.7	96.1	79.3	98.4	53.7	78.4	64.2	74.7	77.3
100.0	15.2	95.7	93.9	93.6	51.9	55.7	84.8	69.6	100.0
77.4	13.0	100.0	99.0	89.8	63.0	n/a	68.8	64.4	36.3
71.5	33.9	82.0	73.7	97.3	57.4	85.1	80.5	77.7	47.5
99.8	65.5	79.9	59.1	98.4	74.1	85.1	77.4	78.4	25.8
89.2	15.2	95.4	98.0	87.7	61.1	60.2	34.2	63.6	42.5
77.5	26.7	86.3	90.4	90.9	53.7	56.9	74.8	72.9	61.4
73.9	22.0	87.9	98.5	86.6	44.4	60.8	n/a	100.0	73.6
85.5	35.6	81.8	64.1	92.5	44.4	97.5	53.5	71.5	57.0
79.0	33.5	77.8	94.9	95.2	64.8	81.9	73.1	75.3	25.9
76.5	28.7	85.3	94.4	96.8	57.4	68.0	94.6	47.7	25.2
43.4	28.7	84.3	92.9	97.3	61.1	84.5	92.4	58.4	27.4
48.6	22.5	87.5	89.9	98.9	37.0	68.7	85.3	55.4	17.2
79.2	30.4	84.9	11.6	94.1	68.5	75.5	59.9	63.8	59.7
67.5	51.0	70.8	96.0	93.0	81.5	74.6	80.2	47.1	16.9
75.6	41.7	75.2	78.3	99.5	63.0	85.1	68.3	75.2	27.3
90.0	83.8	67.2	94.9	97.3	63.0	88.0	n/a	45.6	17.0
59.7	24.2	66.5	96.5	95.2	72.2	75.3	82.2	66.3	18.2
44.9	28.1	80.6	40.4	92.5	77.8	85.1	51.0	74.3	31.5
61.4	26.7	82.5	88.9	94.7	75.9	69.9	68.2	46.9	40.0
70.4	16.5	88.8	94.4	95.7	66.7	68.0	97.7	44.1	20.7
75.7	17.0	82.1	96.5	80.2	n/a	31.2	n/a	87.4	50.9
48.5	49.4	86.3	10.6	93.6	72.2	85.1	61.4	63.2	60.7
45.3	28.0	85.1	97.0	95.7	79.6	58.6	74.3	47.6	31.1
65.4	42.1	73.0	0.0	97.9	68.5	85.1	81.5	60.8	42.7
22.1	20.9	80.9	42.4	96.8	87.0	85.1	55.0	64.5	48.3
23.1	27.4	81.3	51.0	97.3	64.8	88.9	51.0	59.2	48.4
47.5	48.0	87.5	96.5	93.0	66.7	63.9	67.7	42.5	27.5
58.5	32.7	76.5	93.9	97.9	70.4	77.9	96.7	49.8	10.5
59.9	40.1	76.0	90.4	99.5	50.0	81.2	91.9	53.7	14.0
61.7	42.1	71.5	92.9	94.7	83.3	62.9	82.2	46.9	10.9
69.0	13.3	97.9	99.2	74.3	59.3	17.6	32.5	71.3	65.4
25.6	27.8	76.3	54.5	96.8	79.6	85.1	70.3	50.8	35.8
64.7	48.9	62.8	94.9	96.3	59.3	92.2	n/a	46.5	10.0
77.4	n/a	89.9	99.2	56.7	46.3	16.3	4.5	81.3	59.4
52.2	39.9	73.7	97.5	95.7	70.4	85.4	n/a	50.3	14.1
16.3	34.8	73.0	97.1	94.1	81.5	80.3	51.8	45.2	14.3
39.2	n/a	68.8	98.5	86.1	53.7	60.8	n/a	85.9	25.4
58.7	19.9	79.1	92.9	93.6	63.0	75.7	59.8	51.9	19.4
45.7	36.5	71.4	83.8	92.0	51.9	54.2	73.3	43.2	18.9
40.0	59.1	80.7	95.5	86.6	64.8	51.0	40.3	53.0	25.6
49.9	33.4	70.1	0.0	95.2	75.9	85.1	59.3	66.9	17.2
55.5	n/a	75.7	n/a	97.9	74.1	68.0	96.5	34.2	13.4
60.9	30.6	61.4	97.0	96.3	81.5	72.7	n/a	44.9	15.9
66.6	44.6	71.4	96.0	100.0	46.3	55.7	88.8	46.1	7.7
51.9	41.3	78.0	n/a	90.9	57.4	47.6	79.2	44.1	29.6
24.2	70.2	93.1	97.5	88.2	48.1	32.7	88.5	35.6	9.8
50.8	30.1	59.7	93.7	96.3	87.0	75.3	67.0	41.6	3.8
0.0	n/a	67.4	95.5	95.2	59.3	100.0	69.2	57.6	1.9
44.5	22.5	74.0	96.5	95.7	59.3	80.3	48.5	50.7	10.2
22.9	3.9	93.2	95.5	25.7	77.8	40.3	14.6	32.5	51.5
29.4	70.8	63.5	n/a	99.5	70.4	81.2	100.0	41.6	2.7

(continued on next page)

Annex 2 (continued)

GCTCI rankings and scores: Overall and by variable

Rank	City	GCTCI OVERALL	1. ENABLE			2. ATTRACT		
			1.1 GDP per capita	1.2 Internet speed	1.3 Ease of doing business	2.1 Presence of Forbes Global 2000 companies	2.2 Foreign-born population	2.3 FDI projects
53	Eindhoven	48.2	42.0	52.5	72.4	22.0	22.1	3.9
54	The Hague	48.1	39.1	32.5	72.4	36.0	35.4	5.9
55	Moscow	47.7	44.1	15.0	78.1	57.0	16.3	32.4
56	Rotterdam	47.4	38.5	41.3	72.4	13.9	26.5	8.8
57	Bangkok	47.1	24.1	25.0	82.7	57.0	25.3	33.8
58	Kuala Lumpur	47.0	26.2	16.3	86.3	53.0	n/a	32.4
59	Hanover	46.9	37.3	40.0	81.7	27.8	30.6	3.9
60	Frankfurt	46.6	49.5	20.0	81.7	36.0	46.2	0.0
61	Lyon	46.3	39.1	27.5	74.2	0.0	24.1	10.8
62	Lisbon	46.2	28.0	35.0	73.5	27.8	15.1	17.2
63	Antwerp	46.2	41.2	65.0	69.6	0.0	38.1	12.7
64	Nagoya	46.1	36.6	26.3	77.3	53.0	n/a	2.0
65	Abu Dhabi	45.5	100.0	10.0	84.8	36.0	100.0	17.6
66	Bengaluru	45.2	12.0	13.8	59.3	32.3	n/a	55.4
67	Hangzhou	45.1	26.3	1.3	77.1	46.3	n/a	4.4
68	Auckland	44.6	30.9	25.0	100.0	0.0	n/a	10.8
69	Prague	44.1	37.9	28.8	72.9	13.9	19.0	17.6
70	Rome	43.9	34.7	16.3	64.2	41.8	16.8	7.8
71	Yokohama	43.3	24.0	23.8	77.3	13.9	n/a	5.4
72	Tel Aviv	43.1	29.3	17.5	74.0	48.2	34.5	16.2
73	Krakow	43.1	23.7	27.5	75.8	0.0	1.8	12.7
74	Bologna	43.0	38.5	16.3	64.2	13.9	n/a	1.5
75	Nanjing	42.9	27.9	1.3	77.1	41.8	n/a	10.3
76	Birmingham	42.8	23.5	23.8	91.5	13.9	32.3	11.8
77	Cardiff	42.7	21.5	23.8	91.5	0.0	16.7	3.4
78	Shenzhen	42.4	37.1	1.3	77.1	60.2	36.9	21.1
79	Ljubljana	42.2	34.9	33.8	73.5	0.0	25.1	2.9
80	Doha	42.2	84.8	12.5	53.4	39.1	n/a	10.3
81	Mumbai	42.1	13.8	7.5	57.0	65.5	n/a	32.4
82	Kiel	42.1	30.6	n/a	81.7	0.0	19.6	0.5
83	Bilbao	41.9	32.9	33.8	71.4	13.9	14.1	2.9
84	Sao Paulo	41.8	19.0	11.3	27.8	51.6	n/a	31.4
85	Vilnius	41.6	32.1	21.3	86.6	0.0	13.3	18.1
86	Bucharest	41.3	42.7	66.3	65.2	0.0	n/a	29.9
87	Santiago	41.0	15.8	35.0	63.4	39.1	n/a	15.2
88	Buenos Aires	40.9	16.1	27.5	28.4	27.8	16.9	17.6
89	Nantes	40.9	29.5	27.5	74.2	0.0	13.5	4.9
90	Zaragoza	40.6	28.5	n/a	61.1	0.0	16.3	4.4
91	Istanbul	40.5	30.9	15.0	74.2	46.3	2.1	17.6
92	Budapest	40.1	30.2	48.8	65.5	22.0	12.3	14.2
93	Tallinn	39.8	32.8	26.3	84.0	0.0	26.0	4.9
94	Busan	39.5	18.2	27.5	92.8	13.9	n/a	3.4
95	Bratislava	39.3	52.7	26.3	71.1	0.0	7.1	4.9
96	Marseille	39.3	26.8	27.5	74.2	0.0	28.2	6.4
97	Guangzhou	39.2	29.9	1.3	77.1	46.3	n/a	10.8
98	Mexico City	38.5	18.4	18.8	61.1	41.8	12.7	45.6
99	Turin	38.5	30.2	17.5	64.2	22.0	n/a	2.0
100	Wuhan	38.3	24.2	1.3	77.1	32.3	n/a	5.4
101	Brno	38.0	24.9	21.3	69.3	0.0	10.8	3.4
102	Tianjin	37.6	23.4	1.3	77.1	32.3	n/a	7.4
103	Riga	37.6	26.0	21.3	83.2	0.0	22.7	6.4
104	Riyadh	36.8	43.2	11.3	60.8	53.0	n/a	12.3

3. GROW			4. RETAIN				5. GLOBAL KNOWLEDGE SKILLS		
3.1 Major universities	3.2 Tertiary enrolment	3.3 FDI jobs created	4.1 Safety	4.2 Environmental quality	4.3 Traffic travel times	4.4 Affordability	5.1 Tertiary educated population	5.2 Patent applications	5.3 Airport connectivity
49.3	25.0	56.0	n/a	95.7	81.5	69.9	59.8	67.6	3.2
61.7	17.4	58.1	93.9	95.2	68.5	69.9	69.2	48.0	0.5
49.2	n/a	91.4	73.7	90.9	16.7	17.7	19.5	46.1	47.0
67.0	20.3	64.8	93.4	95.2	77.8	69.9	54.3	50.0	0.5
33.8	47.1	91.1	86.4	84.0	22.2	18.1	n/a	27.5	57.9
60.8	n/a	87.5	77.8	80.7	53.7	23.0	n/a	24.3	8.1
19.5	35.2	60.6	95.0	95.7	79.6	80.3	46.9	53.7	3.3
40.0	36.1	0.0	95.7	95.2	72.2	83.2	53.2	39.3	37.6
33.3	60.4	63.9	94.9	94.1	66.7	64.3	72.5	42.8	5.9
26.3	96.6	76.8	97.5	92.0	61.1	31.6	50.5	19.8	15.5
45.5	41.2	67.9	89.4	93.6	63.0	54.2	61.4	25.4	0.0
37.5	n/a	68.3	n/a	87.7	61.1	60.8	n/a	60.3	6.6
26.0	14.4	78.6	n/a	25.7	100.0	40.3	22.7	15.3	11.4
51.1	n/a	99.7	83.8	54.5	n/a	4.1	n/a	46.8	14.5
80.6	n/a	74.9	n/a	49.7	70.4	16.9	n/a	62.6	20.7
49.8	n/a	71.6	96.5	98.4	66.7	56.9	n/a	39.6	11.3
33.3	38.7	81.4	96.5	93.6	70.4	28.5	54.2	38.3	8.9
29.0	29.3	71.3	96.5	91.4	48.1	69.0	44.1	46.8	27.5
22.1	n/a	65.8	98.5	87.2	n/a	60.8	n/a	64.4	13.5
35.0	18.8	73.0	76.8	71.7	42.6	48.2	57.5	50.9	12.0
20.4	100.0	81.5	98.5	83.4	46.3	32.7	75.1	28.3	3.3
51.9	69.8	58.5	n/a	93.0	74.1	60.0	45.3	45.6	4.6
43.6	n/a	87.2	n/a	60.4	64.8	16.9	n/a	63.6	16.6
37.7	28.0	71.4	n/a	97.3	68.5	55.7	49.5	29.9	7.4
54.6	49.3	65.9	n/a	98.4	68.5	55.7	64.4	26.5	0.7
17.7	4.7	84.9	n/a	83.4	53.7	16.9	24.8	89.8	26.6
22.7	62.5	56.9	98.0	92.0	77.8	42.8	66.0	21.5	0.8
39.9	n/a	71.8	97.5	47.1	n/a	35.4	n/a	19.8	20.5
33.9	n/a	88.9	95.5	50.3	0.0	3.3	n/a	46.6	27.5
27.6	57.0	19.1	97.7	95.7	81.5	80.3	48.2	0.0	n/a
19.5	23.7	55.8	97.8	97.9	96.3	61.3	77.6	15.3	2.8
46.0	32.6	82.2	62.6	90.9	42.6	33.9	n/a	40.5	33.5
25.6	40.8	79.8	80.3	91.4	64.8	26.7	86.6	19.8	2.0
12.9	32.7	97.1	96.0	89.3	31.5	25.8	56.6	12.1	7.3
45.6	n/a	73.9	80.3	70.1	46.3	31.4	n/a	33.6	12.4
47.0	68.5	79.6	76.3	91.4	53.7	23.3	54.2	33.6	13.3
12.9	54.8	55.5	97.9	96.3	72.2	60.6	63.4	29.2	3.1
29.7	19.9	61.6	95.3	95.2	94.4	61.3	62.6	19.8	0.1
24.4	n/a	73.1	85.9	85.6	22.2	15.4	11.6	50.9	55.5
15.1	23.3	80.4	88.9	90.9	55.6	22.4	55.1	33.6	7.5
17.2	23.7	64.1	86.9	99.5	64.8	29.6	81.7	24.3	1.4
25.2	n/a	63.9	97.5	82.4	n/a	31.2	n/a	46.1	9.4
16.3	51.0	76.7	82.3	93.6	59.3	19.8	68.7	23.0	1.0
27.1	24.2	58.3	82.3	92.0	55.6	60.6	56.1	37.9	5.1
33.2	38.2	84.7	n/a	75.9	42.6	16.9	0.0	64.7	38.4
36.9	n/a	85.1	38.4	85.0	24.1	6.0	n/a	28.3	26.0
29.5	43.3	55.2	n/a	87.7	75.9	60.0	32.7	42.5	2.3
28.6	n/a	82.2	n/a	56.7	61.1	16.9	n/a	63.1	13.4
21.8	68.5	65.9	96.2	93.6	70.4	28.5	43.3	24.3	0.1
31.6	n/a	85.5	n/a	50.8	70.4	16.9	n/a	47.3	12.1
14.5	42.9	74.4	75.8	92.0	75.9	19.8	63.6	7.7	3.4
39.2	n/a	74.0	n/a	0.0	77.8	43.5	n/a	21.5	10.7

(continued on next page)

Annex 2 (continued)

GCTCI rankings and scores: Overall and by variable

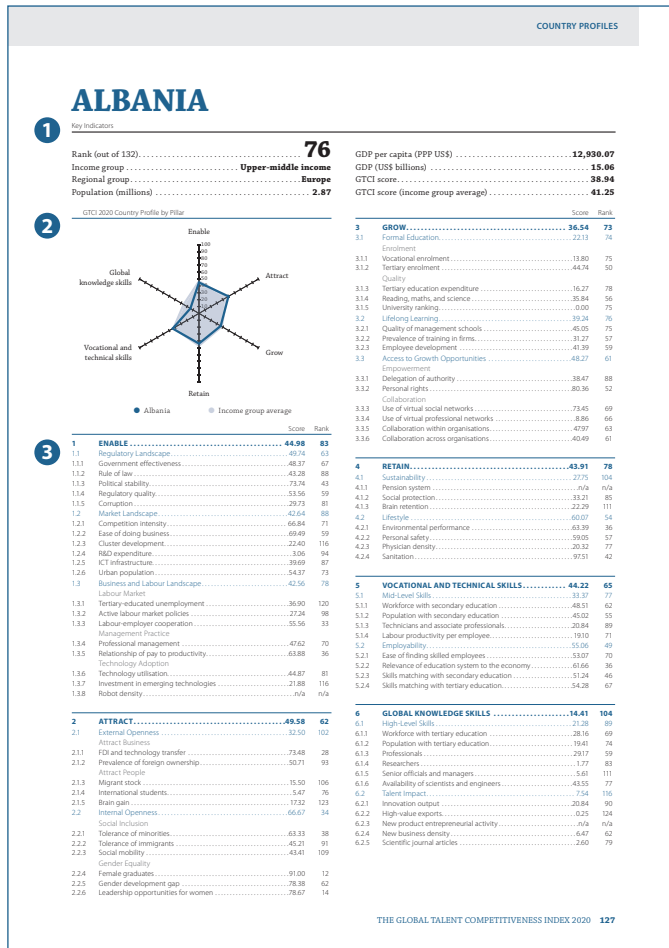
Rank	City	GCTCI OVERALL	1. ENABLE			2. ATTRACT		
			1.1 GDP per capita	1.2 Internet speed	1.3 Ease of doing business	2.1 Presence of Forbes Global 2000 companies	2.2 Foreign-born population	2.3 FDI projects
105	Athens	36.4	25.9	12.5	52.6	39.1	31.0	4.4
106	Xi'an	36.3	14.7	1.3	77.1	22.0	n/a	5.4
107	Sofia	36.2	25.9	27.5	61.9	0.0	4.0	17.2
108	Hyderabad	35.7	3.7	7.5	59.3	13.9	n/a	25.5
109	Chengdu	35.4	16.6	1.3	77.1	13.9	n/a	9.8
110	Jakarta	35.3	18.3	10.0	56.2	32.3	n/a	18.6
111	St. Petersburg	35.2	24.2	15.0	77.1	27.8	n/a	11.8
112	Chongqing	35.0	11.7	1.3	77.1	27.8	n/a	6.9
113	Belgrade	34.6	19.3	27.5	71.4	0.0	n/a	15.2
114	Ho Chi Minh City	34.2	12.0	27.5	56.2	0.0	n/a	39.7
115	Manila	33.5	16.5	18.8	38.1	39.1	n/a	14.2
116	Suzhou	33.2	3.8	1.3	77.1	0.0	n/a	14.7
117	Valletta	33.1	28.7	n/a	46.6	0.0	n/a	0.0
118	Pune	32.8	1.1	6.3	59.3	22.0	n/a	21.1
119	Zagreb	32.5	24.0	23.8	66.0	0.0	22.3	6.9
120	Gurugram	32.2	30.0	7.5	59.3	22.0	n/a	16.2
121	Zhuhai	31.9	30.7	1.3	77.1	13.9	n/a	2.0
122	Kuwait City	31.1	48.7	6.3	50.0	27.8	n/a	3.9
123	Casablanca	31.1	8.0	6.3	65.5	27.8	n/a	12.3
124	Lima	30.8	12.5	11.3	53.4	22.0	n/a	13.7
125	Delhi	30.6	14.1	8.8	61.6	49.9	n/a	22.5
126	Minsk	29.3	16.4	23.8	67.8	0.0	n/a	4.9
127	Zhengzhou	29.3	17.9	1.3	77.1	22.0	n/a	1.5
128	Montevideo	29.1	18.4	13.8	34.8	0.0	n/a	3.9
129	Rabat	29.1	5.8	7.5	65.5	13.9	n/a	2.0
130	Bogota	28.4	15.0	7.5	57.0	32.3	0.3	30.9
131	Baku	28.1	38.6	5.0	74.0	0.0	n/a	6.9
132	Ankara	28.1	24.1	12.5	74.2	0.0	n/a	4.9
133	Kolkata	27.7	5.6	6.3	59.3	32.3	n/a	3.4
134	Cape Town	27.7	11.2	7.5	58.5	27.8	n/a	9.8
135	Rio de Janeiro	27.3	16.5	10.0	29.6	32.3	0.0	7.8
136	Johannesburg	27.3	15.8	7.5	49.0	39.1	8.2	17.2
137	Nairobi	26.6	4.7	10.0	64.9	13.9	n/a	17.2
138	Skopje	26.4	14.3	13.8	84.3	0.0	n/a	3.4
139	Kiev	26.3	19.5	30.0	57.2	0.0	n/a	0.0
140	Medellin	26.2	9.4	15.0	55.7	22.0	n/a	5.9
141	Quito	25.9	11.3	7.5	25.0	0.0	n/a	2.5
142	Abidjan	25.1	3.7	1.3	32.7	0.0	38.1	9.8
143	Brasilia	24.7	27.3	12.5	28.6	13.9	n/a	1.5
144	Makassar	24.2	17.9	8.8	55.7	0.0	n/a	0.5
145	Hanoi	23.4	7.2	8.8	56.2	32.3	n/a	0.0
146	Accra	23.2	0.0	3.8	30.9	0.0	n/a	6.9
147	Phnom Penh	22.7	5.2	6.3	14.9	0.0	n/a	9.3
148	Medan	22.6	14.6	8.8	55.7	0.0	n/a	0.5
149	Tunis	22.3	9.9	6.3	53.4	0.0	n/a	2.9
150	Addis Ababa	21.9	2.4	0.0	0.0	0.0	n/a	2.9
151	Abuja	21.8	3.3	3.8	35.1	0.0	n/a	2.0
152	Lahore	19.6	6.7	3.8	40.2	0.0	n/a	3.4
153	Lagos	19.4	6.4	3.8	21.9	22.0	n/a	8.8
154	Cairo	17.4	10.3	3.8	31.2	0.0	n/a	9.3
155	Karachi	16.3	8.4	3.8	29.6	0.0	n/a	5.9

3. GROW			4. RETAIN				5. GLOBAL KNOWLEDGE SKILLS		
3.1 Major universities	3.2 Tertiary enrolment	3.3 FDI jobs created	4.1 Safety	4.2 Environmental quality	4.3 Traffic travel times	4.4 Affordability	5.1 Tertiary educated population	5.2 Patent applications	5.3 Airport connectivity
20.3	19.9	52.8	96.5	84.0	46.3	27.7	63.1	21.5	12.5
25.4	n/a	80.4	94.9	32.6	n/a	16.9	n/a	46.8	24.4
16.3	33.1	79.8	91.0	87.7	55.6	21.5	69.8	12.1	3.6
21.5	n/a	92.4	83.8	61.0	n/a	4.1	n/a	47.9	9.9
21.5	n/a	81.7	n/a	49.7	48.1	16.9	n/a	58.7	29.0
24.4	n/a	80.1	98.5	62.0	22.2	4.0	n/a	7.7	40.0
34.2	26.8	83.2	75.3	n/a	33.3	12.1	65.7	12.1	9.3
16.3	n/a	83.4	n/a	64.7	38.9	16.9	n/a	52.3	22.5
12.9	n/a	84.5	94.9	88.2	n/a	25.7	n/a	12.1	3.0
17.7	20.5	95.8	93.4	57.8	n/a	20.8	n/a	12.1	22.4
22.9	n/a	79.7	71.2	42.8	n/a	13.3	22.3	21.5	24.5
0.0	n/a	83.3	n/a	67.4	83.3	16.9	n/a	63.2	4.1
0.0	24.6	26.6	100.0	82.9	n/a	n/a	40.0	15.3	3.4
12.9	n/a	91.1	83.8	58.3	n/a	4.1	n/a	34.6	4.4
16.3	38.2	68.4	93.4	86.6	n/a	21.4	n/a	12.1	1.6
0.0	n/a	84.3	83.8	39.6	n/a	4.1	30.0	19.8	n/a
0.0	n/a	70.1	n/a	84.0	42.6	16.9	n/a	58.4	6.4
12.9	10.2	62.5	93.9	39.0	75.9	n/a	12.1	0.0	7.9
0.0	n/a	76.7	89.9	82.9	n/a	23.8	n/a	7.7	2.0
17.9	17.3	82.6	61.1	74.9	13.0	20.2	67.3	7.7	12.3
31.9	10.1	84.9	n/a	0.0	13.0	4.9	n/a	44.1	37.0
23.7	n/a	64.0	83.8	92.5	n/a	3.1	n/a	7.7	0.9
0.0	n/a	59.9	94.9	29.4	n/a	16.9	n/a	36.8	14.1
20.0	n/a	67.4	46.5	92.0	n/a	n/a	n/a	15.3	1.1
0.0	n/a	59.6	89.4	73.3	n/a	n/a	n/a	0.0	0.1
37.9	6.0	85.8	13.1	85.6	3.7	14.1	31.1	17.8	16.3
12.9	n/a	63.6	83.8	71.1	n/a	20.5	n/a	0.0	2.4
20.7	11.3	59.6	n/a	69.5	63.0	15.4	28.3	26.5	9.1
16.2	n/a	64.2	83.8	33.2	n/a	4.1	n/a	21.5	10.9
31.0	n/a	66.4	0.0	n/a	63.0	26.7	n/a	24.3	6.1
22.8	16.3	73.7	20.2	83.4	42.6	28.1	n/a	31.9	14.8
29.0	6.0	70.6	0.0	60.4	64.8	26.7	19.5	21.5	12.2
0.0	7.6	74.7	69.2	88.2	n/a	8.5	n/a	12.1	4.0
0.0	n/a	75.6	92.4	69.0	n/a	2.1	n/a	0.0	0.9
21.0	78.2	0.0	83.8	87.2	35.2	7.8	n/a	12.1	6.0
24.1	n/a	74.0	2.5	73.8	n/a	14.1	n/a	17.8	4.2
14.0	n/a	59.7	65.7	85.6	n/a	n/a	n/a	0.0	2.7
0.0	0.0	73.6	40.4	95.7	n/a	n/a	n/a	7.7	1.1
12.9	n/a	52.7	n/a	42.8	81.5	31.0	n/a	7.7	9.7
0.0	n/a	47.8	96.1	96.3	n/a	4.0	n/a	0.0	7.8
12.9	28.9	0.0	96.9	51.3	n/a	20.8	n/a	0.0	13.3
0.0	n/a	61.8	93.4	46.0	n/a	n/a	n/a	0.0	1.2
0.0	n/a	79.3	90.9	80.7	n/a	8.7	n/a	0.0	0.4
0.0	n/a	43.3	96.7	84.5	n/a	4.0	n/a	0.0	5.7
0.0	n/a	59.8	84.8	57.8	n/a	0.0	n/a	15.3	3.2
0.0	n/a	70.2	61.6	75.4	n/a	n/a	n/a	0.0	7.0
0.0	n/a	63.8	84.8	85.0	n/a	12.1	n/a	0.0	2.7
14.5	n/a	62.6	78.8	0.0	n/a	n/a	n/a	0.0	2.5
0.0	n/a	74.5	0.0	82.9	n/a	12.1	n/a	0.0	4.1
23.2	9.3	70.1	87.9	0.0	38.9	3.8	n/a	0.0	0.9
0.0	n/a	72.7	78.8	0.0	n/a	1.0	n/a	0.0	3.5

Note: n/a = not available.

Country Profiles

How to Read the Country Profiles



1 The first section introduces the country's key indicators. It comprises its rank within the GTCI (out of 132 countries), its income group (based on the World Bank's Income Group Classification as of July 2019), and its regional group (based on the United Nations' sub-regional groups). Additionally, basic country statistics are presented. These include population (in millions), GDP per capita (PPP US\$), and GDP (current US\$ in billions) from the World Bank's World Development Indicators. Finally, the section presents the country's GTCI score and income group average GTCI score.

2 The second section presents a radar chart that outlines the respective country's performance along the six pillars of the GTCI and its position with respect to its income group peers. The dark blue line plots the country's score on each of the six pillars, while the shaded area represents the average scores for its corresponding income group.

3 The third section lays out the country's normalised scores and ranks across all pillars, sub-pillars, and variables. The pillars are identified by a bold single digit notation (e.g., 1 ENABLE) and sub-pillars by a two-digit notation (e.g., 1.2 Market Landscape). Under selected sub-pillars, components are provided in grey. There are no values attached to the components, as they only contextualise the theoretical framework. The 70 variables are indicated by a three-digit notation (e.g., 1.2.3 Cluster development).

For more information about the method of calculation and variable definitions, please refer to Appendix I: Technical Notes and Appendix II: Sources and Definitions, respectively.

The country profiles provide more granular information on how each of the 132 countries performs in the various dimensions of the Global Talent Competitiveness Index (GTCI).

Each country profile consists of three parts:

- 1** Key indicators,
- 2** Radar chart, and
- 3** Scores and Ranks.

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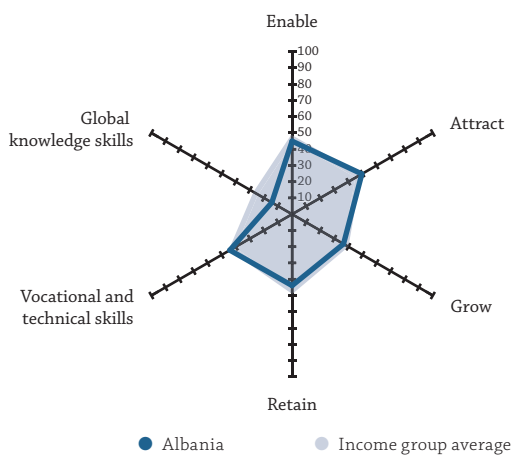
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ALBANIA

Key Indicators

Rank (out of 132).....	76
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	2.87

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	44.98	83
1.1 Regulatory Landscape.....	49.74	63
1.1.1 Government effectiveness.....	48.37	67
1.1.2 Rule of law.....	43.28	88
1.1.3 Political stability.....	73.74	43
1.1.4 Regulatory quality.....	53.56	59
1.1.5 Corruption.....	29.73	81
1.2 Market Landscape.....	42.64	88
1.2.1 Competition intensity.....	66.84	71
1.2.2 Ease of doing business.....	69.49	59
1.2.3 Cluster development.....	22.40	116
1.2.4 R&D expenditure.....	3.06	94
1.2.5 ICT infrastructure.....	39.69	87
1.2.6 Urban population.....	54.37	73
1.3 Business and Labour Landscape.....	42.56	78
Labour Market		
1.3.1 Tertiary-educated unemployment.....	36.90	120
1.3.2 Active labour market policies.....	27.24	98
1.3.3 Labour-employer cooperation.....	55.56	33
Management Practice		
1.3.4 Professional management.....	47.62	70
1.3.5 Relationship of pay to productivity.....	63.88	36
Technology Adoption		
1.3.6 Technology utilisation.....	44.87	81
1.3.7 Investment in emerging technologies.....	21.88	116
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	49.58	62
2.1 External Openness.....	32.50	102
Attract Business		
2.1.1 FDI and technology transfer.....	73.48	28
2.1.2 Prevalence of foreign ownership.....	50.71	93
Attract People		
2.1.3 Migrant stock.....	15.50	106
2.1.4 International students.....	5.47	76
2.1.5 Brain gain.....	17.32	123
2.2 Internal Openness.....	66.67	34
Social Inclusion		
2.2.1 Tolerance of minorities.....	63.33	38
2.2.2 Tolerance of immigrants.....	45.21	91
2.2.3 Social mobility.....	43.41	109
Gender Equality		
2.2.4 Female graduates.....	91.00	12
2.2.5 Gender development gap.....	78.38	62
2.2.6 Leadership opportunities for women.....	78.67	14

GDP per capita (PPP US\$).....	12,930.07
GDP (US\$ billions).....	15.06
GTCI score.....	38.94
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	36.54	73
3.1 Formal Education.....	22.13	74
Enrolment		
3.1.1 Vocational enrolment.....	13.80	75
3.1.2 Tertiary enrolment.....	44.74	50
Quality		
3.1.3 Tertiary education expenditure.....	16.27	78
3.1.4 Reading, maths, and science.....	35.84	56
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	39.24	76
3.2.1 Quality of management schools.....	45.05	75
3.2.2 Prevalence of training in firms.....	31.27	57
3.2.3 Employee development.....	41.39	59
3.3 Access to Growth Opportunities.....	48.27	61
Empowerment		
3.3.1 Delegation of authority.....	38.47	88
3.3.2 Personal rights.....	80.36	52
Collaboration		
3.3.3 Use of virtual social networks.....	73.45	69
3.3.4 Use of virtual professional networks.....	8.86	66
3.3.5 Collaboration within organisations.....	47.97	63
3.3.6 Collaboration across organisations.....	40.49	61

4 RETAIN.....	43.91	78
4.1 Sustainability.....	27.75	104
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	33.21	85
4.1.3 Brain retention.....	22.29	111
4.2 Lifestyle.....	60.07	54
4.2.1 Environmental performance.....	63.39	36
4.2.2 Personal safety.....	59.05	57
4.2.3 Physician density.....	20.32	77
4.2.4 Sanitation.....	97.51	42

5 VOCATIONAL AND TECHNICAL SKILLS.....	44.22	65
5.1 Mid-Level Skills.....	33.37	77
5.1.1 Workforce with secondary education.....	48.51	62
5.1.2 Population with secondary education.....	45.02	55
5.1.3 Technicians and associate professionals.....	20.84	89
5.1.4 Labour productivity per employee.....	19.10	71
5.2 Employability.....	55.06	49
5.2.1 Ease of finding skilled employees.....	53.07	70
5.2.2 Relevance of education system to the economy.....	61.66	36
5.2.3 Skills matching with secondary education.....	51.24	46
5.2.4 Skills matching with tertiary education.....	54.28	67

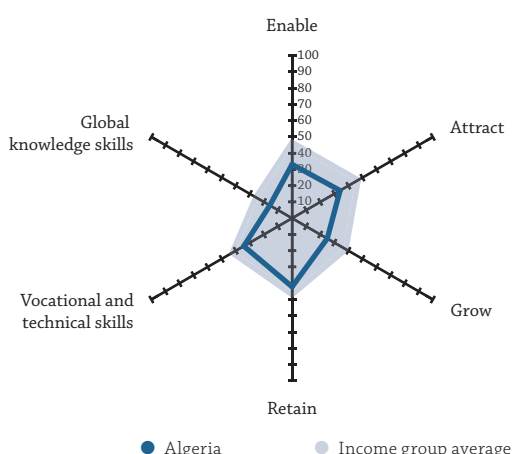
6 GLOBAL KNOWLEDGE SKILLS.....	14.41	104
6.1 High-Level Skills.....	21.28	89
6.1.1 Workforce with tertiary education.....	28.16	69
6.1.2 Population with tertiary education.....	19.41	74
6.1.3 Professionals.....	29.17	59
6.1.4 Researchers.....	1.77	83
6.1.5 Senior officials and managers.....	5.61	111
6.1.6 Availability of scientists and engineers.....	43.55	77
6.2 Talent Impact.....	7.54	116
6.2.1 Innovation output.....	20.84	90
6.2.2 High-value exports.....	0.25	124
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	6.47	62
6.2.5 Scientific journal articles.....	2.60	79

ALGERIA

Key Indicators

Rank (out of 132).....	105
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	42.23

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	33.14	117
1.1 Regulatory Landscape.....	31.12	116
1.1.1 Government effectiveness.....	32.08	104
1.1.2 Rule of law.....	32.47	115
1.1.3 Political stability.....	43.93	114
1.1.4 Regulatory quality.....	18.72	127
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	39.53	97
1.2.1 Competition intensity.....	46.13	123
1.2.2 Ease of doing business.....	34.01	122
1.2.3 Cluster development.....	33.12	93
1.2.4 R&D expenditure.....	11.38	58
1.2.5 ICT infrastructure.....	44.02	80
1.2.6 Urban population.....	68.53	48
1.3 Business and Labour Landscape.....	28.78	120
Labour Market		
1.3.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	33.18	80
1.3.3 Labour-employer cooperation.....	27.93	96
Management Practice		
1.3.4 Professional management.....	15.97	130
1.3.5 Relationship of pay to productivity.....	35.33	106
Technology Adoption		
1.3.6 Technology utilisation.....	26.37	118
1.3.7 Investment in emerging technologies.....	33.92	84
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	34.08	123
2.1 External Openness.....	19.40	129
Attract Business		
2.1.1 FDI and technology transfer.....	37.96	114
2.1.2 Prevalence of foreign ownership.....	28.23	124
Attract People		
2.1.3 Migrant stock.....	12.00	112
2.1.4 International students.....	1.93	89
2.1.5 Brain gain.....	16.88	124
2.2 Internal Openness.....	48.76	99
Social Inclusion		
2.2.1 Tolerance of minorities.....	28.89	94
2.2.2 Tolerance of immigrants.....	26.03	111
2.2.3 Social mobility.....	43.05	110
Gender Equality		
2.2.4 Female graduates.....	90.97	13
2.2.5 Gender development gap.....	39.26	121
2.2.6 Leadership opportunities for women.....	64.35	33

GDP per capita (PPP US\$).....	15,621.86
GDP (US\$ billions).....	180.69
GTCI score.....	30.75
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	24.98	116
3.1 Formal Education.....	17.57	84
Enrolment		
3.1.1 Vocational enrolment.....	12.83	76
3.1.2 Tertiary enrolment.....	37.38	61
Quality		
3.1.3 Tertiary education expenditure.....	26.97	42
3.1.4 Reading, maths, and science.....	10.68	66
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	26.62	124
3.2.1 Quality of management schools.....	29.29	116
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	23.94	116
3.3 Access to Growth Opportunities.....	30.77	122
Empowerment		
3.3.1 Delegation of authority.....	10.00	130
3.3.2 Personal rights.....	45.92	104
Collaboration		
3.3.3 Use of virtual social networks.....	65.49	93
3.3.4 Use of virtual professional networks.....	4.14	90
3.3.5 Collaboration within organisations.....	25.65	128
3.3.6 Collaboration across organisations.....	33.39	82

4 RETAIN.....	42.15	84
4.1 Sustainability.....	33.81	90
4.1.1 Pension system.....	41.03	61
4.1.2 Social protection.....	40.86	71
4.1.3 Brain retention.....	19.53	117
4.2 Lifestyle.....	50.50	80
4.2.1 Environmental performance.....	49.59	76
4.2.2 Personal safety.....	46.82	83
4.2.3 Physician density.....	19.05	79
4.2.4 Sanitation.....	86.53	75

5 VOCATIONAL AND TECHNICAL SKILLS.....	34.29	95
5.1 Mid-Level Skills.....	31.77	81
5.1.1 Workforce with secondary education.....	48.78	61
5.1.2 Population with secondary education.....	23.35	91
5.1.3 Technicians and associate professionals.....	20.05	92
5.1.4 Labour productivity per employee.....	34.90	49
5.2 Employability.....	36.82	102
5.2.1 Ease of finding skilled employees.....	47.97	89
5.2.2 Relevance of education system to the economy.....	33.72	93
5.2.3 Skills matching with secondary education.....	28.95	109
5.2.4 Skills matching with tertiary education.....	36.64	115

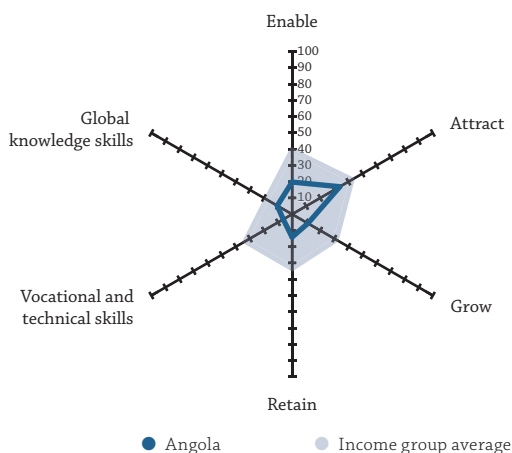
6 GLOBAL KNOWLEDGE SKILLS.....	15.83	97
6.1 High-Level Skills.....	24.00	83
6.1.1 Workforce with tertiary education.....	33.85	57
6.1.2 Population with tertiary education.....	11.40	90
6.1.3 Professionals.....	25.49	68
6.1.4 Researchers.....	9.83	53
6.1.5 Senior officials and managers.....	18.17	72
6.1.6 Availability of scientists and engineers.....	45.29	73
6.2 Talent Impact.....	7.66	115
6.2.1 Innovation output.....	12.08	115
6.2.2 High-value exports.....	1.61	115
6.2.3 New product entrepreneurial activity.....	17.57	82
6.2.4 New business density.....	2.74	81
6.2.5 Scientific journal articles.....	4.31	73

ANGOLA

Key Indicators

Rank (out of 132).....	131
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	30.81

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....19.79 128		
1.1 Regulatory Landscape.....27.25 125		
1.1.1 Government effectiveness.....21.60 124		
1.1.2 Rule of law.....26.88 125		
1.1.3 Political stability.....58.55 83		
1.1.4 Regulatory quality.....22.46 125		
1.1.5 Corruption.....6.76 129		
1.2 Market Landscape.....20.87 129		
1.2.1 Competition intensity.....8.37 131		
1.2.2 Ease of doing business.....23.67 127		
1.2.3 Cluster development.....0.00 132		
1.2.4 R&D expenditure.....n/a n/a		
1.2.5 ICT infrastructure.....11.96 120		
1.2.6 Urban population.....60.35 65		
1.3 Business and Labour Landscape.....11.25 132		
Labour Market		
1.3.1 Tertiary-educated unemployment.....58.30 105		
1.3.2 Active labour market policies.....0.00 132		
1.3.3 Labour-employer cooperation.....9.02 125		
Management Practice		
1.3.4 Professional management.....0.00 132		
1.3.5 Relationship of pay to productivity.....4.62 131		
Technology Adoption		
1.3.6 Technology utilisation.....6.84 129		
1.3.7 Investment in emerging technologies.....0.00 131		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....33.86 124		
2.1 External Openness.....32.18 104		
Attract Business		
2.1.1 FDI and technology transfer.....31.76 125		
2.1.2 Prevalence of foreign ownership.....36.87 117		
Attract People		
2.1.3 Migrant stock.....30.21 82		
2.1.4 International students.....n/a n/a		
2.1.5 Brain gain.....29.87 99		
2.2 Internal Openness.....35.55 127		
Social Inclusion		
2.2.1 Tolerance of minorities.....27.78 95		
2.2.2 Tolerance of immigrants.....53.42 79		
2.2.3 Social mobility.....24.05 130		
Gender Equality		
2.2.4 Female graduates.....56.10 87		
2.2.5 Gender development gap.....n/a n/a		
2.2.6 Leadership opportunities for women.....16.37 124		

GDP per capita (PPP US\$).....	6,440.98
GDP (US\$ billions).....	105.75
GTCI score.....	15.96
GTCI score (income group average).....	32.97

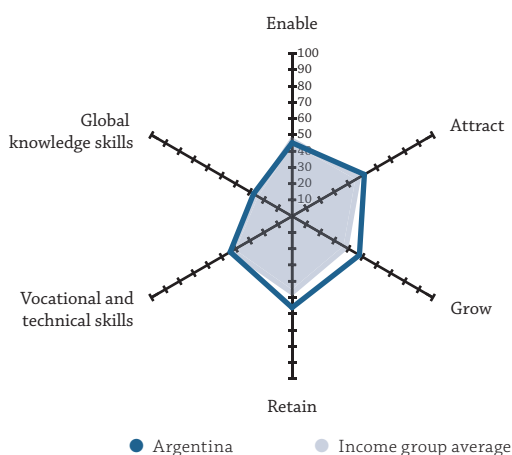
	Score	Rank
3 GROW.....11.24 131		
3.1 Formal Education.....9.57 114		
Enrolment		
3.1.1 Vocational enrolment.....21.82 54		
3.1.2 Tertiary enrolment.....6.89 109		
Quality		
3.1.3 Tertiary education expenditure.....n/a n/a		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....8.96 131		
3.2.1 Quality of management schools.....0.00 132		
3.2.2 Prevalence of training in firms.....26.52 69		
3.2.3 Employee development.....0.37 131		
3.3 Access to Growth Opportunities.....15.18 131		
Empowerment		
3.3.1 Delegation of authority.....0.00 132		
3.3.2 Personal rights.....47.10 103		
Collaboration		
3.3.3 Use of virtual social networks.....42.31 123		
3.3.4 Use of virtual professional networks.....1.66 107		
3.3.5 Collaboration within organisations.....0.00 132		
3.3.6 Collaboration across organisations.....0.00 132		
4 RETAIN.....14.07 130		
4.1 Sustainability.....9.41 131		
4.1.1 Pension system.....1.25 116		
4.1.2 Social protection.....6.60 129		
4.1.3 Brain retention.....20.39 116		
4.2 Lifestyle.....18.73 127		
4.2.1 Environmental performance.....16.69 124		
4.2.2 Personal safety.....21.40 121		
4.2.3 Physician density.....2.00 108		
4.2.4 Sanitation.....34.82 115		
5 VOCATIONAL AND TECHNICAL SKILLS.....6.27 132		
5.1 Mid-Level Skills.....12.53 117		
5.1.1 Workforce with secondary education.....9.38 116		
5.1.2 Population with secondary education.....17.59 100		
5.1.3 Technicians and associate professionals.....15.04 102		
5.1.4 Labour productivity per employee.....8.12 90		
5.2 Employability.....0.00 132		
5.2.1 Ease of finding skilled employees.....0.00 132		
5.2.2 Relevance of education system to the economy.....0.00 132		
5.2.3 Skills matching with secondary education.....0.00 132		
5.2.4 Skills matching with tertiary education.....0.00 132		
6 GLOBAL KNOWLEDGE SKILLS.....10.53 117		
6.1 High-Level Skills.....5.13 131		
6.1.1 Workforce with tertiary education.....4.28 119		
6.1.2 Population with tertiary education.....2.53 102		
6.1.3 Professionals.....13.44 102		
6.1.4 Researchers.....0.45 94		
6.1.5 Senior officials and managers.....10.07 96		
6.1.6 Availability of scientists and engineers.....0.00 132		
6.2 Talent Impact.....15.93 84		
6.2.1 Innovation output.....n/a n/a		
6.2.2 High-value exports.....n/a n/a		
6.2.3 New product entrepreneurial activity.....31.86 63		
6.2.4 New business density.....n/a n/a		
6.2.5 Scientific journal articles.....0.01 131		

ARGENTINA

Key Indicators

Rank (out of 132).....	56
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	44.49

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	45.18	82
1.1 Regulatory Landscape.....	48.46	69
1.1.1 Government effectiveness.....	50.42	61
1.1.2 Rule of law.....	46.93	76
1.1.3 Political stability.....	68.87	56
1.1.4 Regulatory quality.....	40.94	92
1.1.5 Corruption.....	35.14	70
1.2 Market Landscape.....	49.30	69
1.2.1 Competition intensity.....	46.76	122
1.2.2 Ease of doing business.....	50.36	99
1.2.3 Cluster development.....	30.64	97
1.2.4 R&D expenditure.....	11.36	59
1.2.5 ICT infrastructure.....	66.03	55
1.2.6 Urban population.....	90.65	9
1.3 Business and Labour Landscape.....	37.77	94
Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.10	36
1.3.2 Active labour market policies.....	29.42	97
1.3.3 Labour-employer cooperation.....	15.14	117
Management Practice		
1.3.4 Professional management.....	53.40	58
1.3.5 Relationship of pay to productivity.....	32.24	113
Technology Adoption		
1.3.6 Technology utilisation.....	44.03	86
1.3.7 Investment in emerging technologies.....	34.66	82
1.3.8 Robot density.....	5.17	40
2 ATTRACT.....	51.36	57
2.1 External Openness.....	37.82	85
Attract Business		
2.1.1 FDI and technology transfer.....	41.79	106
2.1.2 Prevalence of foreign ownership.....	56.60	70
Attract People		
2.1.3 Migrant stock.....	45.34	54
2.1.4 International students.....	8.99	65
2.1.5 Brain gain.....	36.37	90
2.2 Internal Openness.....	64.91	40
Social Inclusion		
2.2.1 Tolerance of minorities.....	62.22	41
2.2.2 Tolerance of immigrants.....	79.45	25
2.2.3 Social mobility.....	36.92	124
Gender Equality		
2.2.4 Female graduates.....	94.03	8
2.2.5 Gender development gap.....	87.72	21
2.2.6 Leadership opportunities for women.....	29.11	103

GDP per capita (PPP US\$).....	20,567.30
GDP (US\$ billions).....	518.48
GTGI score.....	45.33
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	47.83	38
3.1 Formal Education.....	44.56	30
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	70.30	7
Quality		
3.1.3 Tertiary education expenditure.....	26.07	45
3.1.4 Reading, maths, and science.....	39.12	50
3.1.5 University ranking.....	42.77	29
3.2 Lifelong Learning.....	47.06	54
3.2.1 Quality of management schools.....	59.87	39
3.2.2 Prevalence of training in firms.....	48.55	32
3.2.3 Employee development.....	32.76	84
3.3 Access to Growth Opportunities.....	51.88	46
Empowerment		
3.3.1 Delegation of authority.....	43.42	72
3.3.2 Personal rights.....	92.23	30
Collaboration		
3.3.3 Use of virtual social networks.....	74.16	64
3.3.4 Use of virtual professional networks.....	30.10	23
3.3.5 Collaboration within organisations.....	35.12	103
3.3.6 Collaboration across organisations.....	36.24	76

4 RETAIN.....	56.21	51
4.1 Sustainability.....	47.94	48
4.1.1 Pension system.....	50.20	54
4.1.2 Social protection.....	45.54	61
4.1.3 Brain retention.....	48.08	49
4.2 Lifestyle.....	64.47	44
4.2.1 Environmental performance.....	53.13	64
4.2.2 Personal safety.....	47.97	81
4.2.3 Physician density.....	62.35	14
4.2.4 Sanitation.....	94.45	56

5 VOCATIONAL AND TECHNICAL SKILLS.....	43.96	67
5.1 Mid-Level Skills.....	42.80	61
5.1.1 Workforce with secondary education.....	57.91	43
5.1.2 Population with secondary education.....	49.21	45
5.1.3 Technicians and associate professionals.....	39.26	56
5.1.4 Labour productivity per employee.....	24.82	60
5.2 Employability.....	45.11	78
5.2.1 Ease of finding skilled employees.....	55.11	65
5.2.2 Relevance of education system to the economy.....	30.83	101
5.2.3 Skills matching with secondary education.....	34.71	85
5.2.4 Skills matching with tertiary education.....	59.80	56

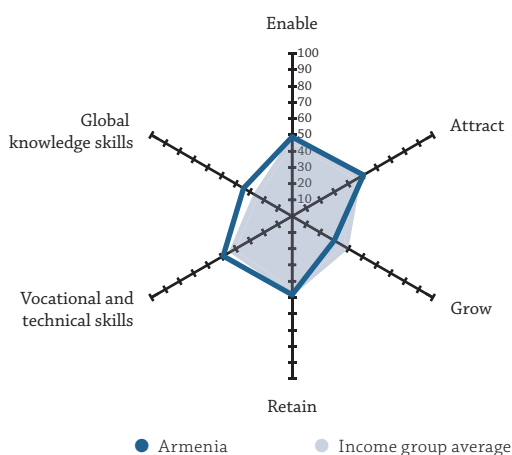
6 GLOBAL KNOWLEDGE SKILLS.....	27.42	64
6.1 High-Level Skills.....	29.36	66
6.1.1 Workforce with tertiary education.....	32.69	59
6.1.2 Population with tertiary education.....	30.13	55
6.1.3 Professionals.....	25.71	67
6.1.4 Researchers.....	14.83	46
6.1.5 Senior officials and managers.....	29.64	50
6.1.6 Availability of scientists and engineers.....	43.14	80
6.2 Talent Impact.....	25.49	55
6.2.1 Innovation output.....	26.62	73
6.2.2 High-value exports.....	26.65	45
6.2.3 New product entrepreneurial activity.....	64.35	16
6.2.4 New business density.....	2.03	88
6.2.5 Scientific journal articles.....	7.83	57

ARMENIA

Key Indicators

Rank (out of 132).....	60
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	2.95

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	48.78	61
1.1 Regulatory Landscape.....	45.22	79
1.1.1 Government effectiveness.....	44.20	78
1.1.2 Rule of law.....	49.03	70
1.1.3 Political stability.....	49.53	104
1.1.4 Regulatory quality.....	54.97	56
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	53.92	58
1.2.1 Competition intensity.....	77.26	35
1.2.2 Ease of doing business.....	79.96	38
1.2.3 Cluster development.....	42.40	68
1.2.4 R&D expenditure.....	4.67	88
1.2.5 ICT infrastructure.....	61.58	62
1.2.6 Urban population.....	57.63	69
1.3 Business and Labour Landscape.....	47.21	66
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	41.15	114
1.3.2 Active labour market policies.....	38.86	68
1.3.3 Labour-employer cooperation.....	51.65	40
1.3.4 Management Practice		
1.3.4 Professional management.....	49.86	63
1.3.5 Relationship of pay to productivity.....	54.13	55
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	48.58	69
1.3.7 Investment in emerging technologies.....	46.26	51
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	50.68	59
2.1 External Openness.....	39.27	80
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	51.72	83
2.1.2 Prevalence of foreign ownership.....	43.29	104
2.1.3 Attract People		
2.1.3 Migrant stock.....	49.43	50
2.1.4 International students.....	15.72	44
2.1.5 Brain gain.....	36.19	91
2.2 Internal Openness.....	62.08	49
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	50.00	59
2.2.2 Tolerance of immigrants.....	60.27	60
2.2.3 Social mobility.....	49.94	89
2.2.4 Gender Equality		
2.2.4 Female graduates.....	74.45	57
2.2.5 Gender development gap.....	77.99	64
2.2.6 Leadership opportunities for women.....	59.86	43

GDP per capita (PPP US\$).....	10,324.94
GDP (US\$ billions).....	12.43
GTCI score.....	43.52
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	29.93	100
3.1 Formal Education.....	15.84	90
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	16.22	64
3.1.2 Tertiary enrolment.....	40.97	53
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	6.16	107
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	27.98	122
3.2.1 Quality of management schools.....	36.47	97
3.2.2 Prevalence of training in firms.....	16.89	88
3.2.3 Employee development.....	30.59	93
3.3 Access to Growth Opportunities.....	45.97	68
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	39.89	83
3.3.2 Personal rights.....	71.22	72
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	70.55	77
3.3.4 Use of virtual professional networks.....	4.62	87
3.3.5 Collaboration within organisations.....	50.26	55
3.3.6 Collaboration across organisations.....	39.29	68

4 RETAIN.....	48.30	64
4.1 Sustainability.....	33.83	89
4.1.1 Pension system.....	36.92	63
4.1.2 Social protection.....	31.72	92
4.1.3 Brain retention.....	32.85	88
4.2 Lifestyle.....	62.76	46
4.2.1 Environmental performance.....	57.74	56
4.2.2 Personal safety.....	57.73	62
4.2.3 Physician density.....	44.64	43
4.2.4 Sanitation.....	90.94	67

5 VOCATIONAL AND TECHNICAL SKILLS.....	48.95	49
5.1 Mid-Level Skills.....	51.64	45
5.1.1 Workforce with secondary education.....	89.31	6
5.1.2 Population with secondary education.....	62.41	29
5.1.3 Technicians and associate professionals.....	37.95	57
5.1.4 Labour productivity per employee.....	16.89	74
5.2 Employability.....	46.27	74
5.2.1 Ease of finding skilled employees.....	48.67	85
5.2.2 Relevance of education system to the economy.....	50.80	53
5.2.3 Skills matching with secondary education.....	42.61	65
5.2.4 Skills matching with tertiary education.....	42.98	98

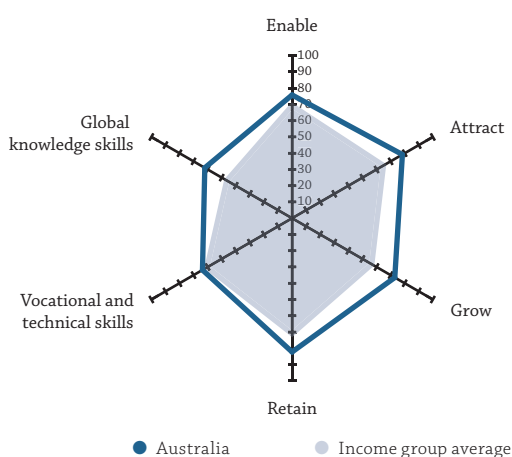
6 GLOBAL KNOWLEDGE SKILLS.....	34.49	47
6.1 High-Level Skills.....	50.62	25
6.1.1 Workforce with tertiary education.....	44.49	40
6.1.2 Population with tertiary education.....	75.99	46
6.1.3 Professionals.....	37.66	46
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	36.77	39
6.1.6 Availability of scientists and engineers.....	58.18	47
6.2 Talent Impact.....	18.36	77
6.2.1 Innovation output.....	38.88	48
6.2.2 High-value exports.....	19.27	61
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	8.32	54
6.2.5 Scientific journal articles.....	6.99	60

AUSTRALIA

Key Indicators

Rank (out of 132).....	10
Income group.....	High income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	24.99

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....75.84	17	
1.1 Regulatory Landscape.....	88.20	11
1.1.1 Government effectiveness.....	83.76	14
1.1.2 Rule of law.....	91.94	12
1.1.3 Political stability.....	84.69	23
1.1.4 Regulatory quality.....	95.46	4
1.1.5 Corruption.....	85.14	13
1.2 Market Landscape.....	72.84	18
1.2.1 Competition intensity.....	86.59	10
1.2.2 Ease of doing business.....	88.46	16
1.2.3 Cluster development.....	55.84	39
1.2.4 R&D expenditure.....	41.84	18
1.2.5 ICT infrastructure.....	80.41	23
1.2.6 Urban population.....	83.92	22
1.3 Business and Labour Landscape.....	66.47	24
Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.83	30
1.3.2 Active labour market policies.....	76.85	16
1.3.3 Labour-employer cooperation.....	39.21	63
Management Practice		
1.3.4 Professional management.....	95.83	5
1.3.5 Relationship of pay to productivity.....	67.49	28
Technology Adoption		
1.3.6 Technology utilisation.....	75.91	25
1.3.7 Investment in emerging technologies.....	65.76	23
1.3.8 Robot density.....	21.92	23
2 ATTRACT.....78.37	7	
2.1 External Openness.....	75.70	8
Attract Business		
2.1.1 FDI and technology transfer.....	77.79	20
2.1.2 Prevalence of foreign ownership.....	82.47	14
Attract People		
2.1.3 Migrant stock.....	79.40	9
2.1.4 International students.....	64.20	9
2.1.5 Brain gain.....	74.64	15
2.2 Internal Openness.....	81.04	10
Social Inclusion		
2.2.1 Tolerance of minorities.....	74.44	20
2.2.2 Tolerance of immigrants.....	95.89	4
2.2.3 Social mobility.....	93.97	5
Gender Equality		
2.2.4 Female graduates.....	75.02	54
2.2.5 Gender development gap.....	79.88	56
2.2.6 Leadership opportunities for women.....	67.03	26

GDP per capita (PPP US\$).....	51,544.87
GDP (US\$ billions).....	1,432.20
GTCI score.....	72.53
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....72.96	9	
3.1 Formal Education.....	68.14	1
Enrolment		
3.1.1 Vocational enrolment.....	56.63	11
3.1.2 Tertiary enrolment.....	89.96	2
Quality		
3.1.3 Tertiary education expenditure.....	36.41	20
3.1.4 Reading, maths, and science.....	76.78	18
3.1.5 University ranking.....	80.93	5
3.2 Lifelong Learning.....	74.93	14
3.2.1 Quality of management schools.....	75.39	18
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	74.48	13
3.3 Access to Growth Opportunities.....	75.82	14
Empowerment		
3.3.1 Delegation of authority.....	87.90	8
3.3.2 Personal rights.....	98.00	6
Collaboration		
3.3.3 Use of virtual social networks.....	85.10	32
3.3.4 Use of virtual professional networks.....	62.25	6
3.3.5 Collaboration within organisations.....	73.32	23
3.3.6 Collaboration across organisations.....	48.33	39

4 RETAIN.....82.29	11	
4.1 Sustainability.....	82.76	10
4.1.1 Pension system.....	88.80	15
4.1.2 Social protection.....	87.17	12
4.1.3 Brain retention.....	72.30	18
4.2 Lifestyle.....	81.83	11
4.2.1 Environmental performance.....	77.83	21
4.2.2 Personal safety.....	93.72	4
4.2.3 Physician density.....	55.76	21
4.2.4 Sanitation.....	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS.....63.67	20	
5.1 Mid-Level Skills.....	54.14	38
5.1.1 Workforce with secondary education.....	53.64	50
5.1.2 Population with secondary education.....	47.52	52
5.1.3 Technicians and associate professionals.....	55.37	34
5.1.4 Labour productivity per employee.....	60.01	15
5.2 Employability.....	73.19	17
5.2.1 Ease of finding skilled employees.....	74.38	22
5.2.2 Relevance of education system to the economy.....	70.24	16
5.2.3 Skills matching with secondary education.....	69.67	15
5.2.4 Skills matching with tertiary education.....	78.48	18

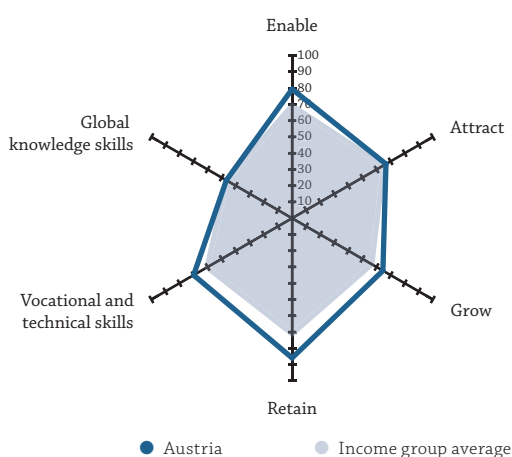
6 GLOBAL KNOWLEDGE SKILLS.....62.03	9	
6.1 High-Level Skills.....	63.09	11
6.1.1 Workforce with tertiary education.....	57.48	22
6.1.2 Population with tertiary education.....	66.23	8
6.1.3 Professionals.....	57.78	17
6.1.4 Researchers.....	54.96	16
6.1.5 Senior officials and managers.....	68.91	8
6.1.6 Availability of scientists and engineers.....	73.19	18
6.2 Talent Impact.....	60.97	8
6.2.1 Innovation output.....	52.36	30
6.2.2 High-value exports.....	38.09	28
6.2.3 New product entrepreneurial activity.....	56.07	30
6.2.4 New business density.....	74.69	6
6.2.5 Scientific journal articles.....	83.66	3

AUSTRIA

Key Indicators

Rank (out of 132).....	17
Income group.....	High income
Regional group.....	Europe
Population (millions).....	8.85

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....79.41	13	
1.1 Regulatory Landscape.....	86.37	14
1.1.1 Government effectiveness.....	81.97	15
1.1.2 Rule of law.....	94.99	9
1.1.3 Political stability.....	87.77	15
1.1.4 Regulatory quality.....	83.37	17
1.1.5 Corruption.....	83.78	14
1.2 Market Landscape.....	75.99	14
1.2.1 Competition intensity.....	85.96	11
1.2.2 Ease of doing business.....	85.67	24
1.2.3 Cluster development.....	78.08	13
1.2.4 R&D expenditure.....	68.94	6
1.2.5 ICT infrastructure.....	85.24	14
1.2.6 Urban population.....	52.05	78
1.3 Business and Labour Landscape.....	75.86	11
Labour Market		
1.3.1 Tertiary-educated unemployment.....	89.49	28
1.3.2 Active labour market policies.....	97.59	3
1.3.3 Labour-employer cooperation.....	77.42	10
Management Practice		
1.3.4 Professional management.....	81.47	20
1.3.5 Relationship of pay to productivity.....	67.55	27
Technology Adoption		
1.3.6 Technology utilisation.....	77.21	20
1.3.7 Investment in emerging technologies.....	64.42	25
1.3.8 Robot density.....	51.73	11
2 ATTRACT.....66.71	24	
2.1 External Openness.....	64.55	22
Attract Business		
2.1.1 FDI and technology transfer.....	66.28	46
2.1.2 Prevalence of foreign ownership.....	68.97	43
Attract People		
2.1.3 Migrant stock.....	69.95	17
2.1.4 International students.....	60.01	10
2.1.5 Brain gain.....	57.55	34
2.2 Internal Openness.....	68.86	28
Social Inclusion		
2.2.1 Tolerance of minorities.....	61.11	42
2.2.2 Tolerance of immigrants.....	68.49	45
2.2.3 Social mobility.....	86.35	13
Gender Equality		
2.2.4 Female graduates.....	67.57	74
2.2.5 Gender development gap.....	78.51	61
2.2.6 Leadership opportunities for women.....	51.12	57

GDP per capita (PPP US\$).....	56,253.09
GDP (US\$ billions).....	455.74
GTCI score.....	68.87
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....64.52	16	
3.1 Formal Education.....	56.10	10
Enrolment		
3.1.1 Vocational enrolment.....	53.57	14
3.1.2 Tertiary enrolment.....	68.10	11
Quality		
3.1.3 Tertiary education expenditure.....	42.71	11
3.1.4 Reading, maths, and science.....	72.06	24
3.1.5 University ranking.....	44.05	25
3.2 Lifelong Learning.....	71.47	19
3.2.1 Quality of management schools.....	68.94	27
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	74.00	15
3.3 Access to Growth Opportunities.....	65.98	22
Empowerment		
3.3.1 Delegation of authority.....	76.80	19
3.3.2 Personal rights.....	91.40	33
Collaboration		
3.3.3 Use of virtual social networks.....	71.35	72
3.3.4 Use of virtual professional networks.....	11.36	56
3.3.5 Collaboration within organisations.....	84.00	12
3.3.6 Collaboration across organisations.....	60.99	24

4 RETAIN.....85.95	5	
4.1 Sustainability.....	82.85	9
4.1.1 Pension system.....	88.56	16
4.1.2 Social protection.....	99.05	4
4.1.3 Brain retention.....	60.94	34
4.2 Lifestyle.....	89.05	2
4.2.1 Environmental performance.....	85.91	8
4.2.2 Personal safety.....	86.75	14
4.2.3 Physician density.....	83.56	2
4.2.4 Sanitation.....	99.97	11

5 VOCATIONAL AND TECHNICAL SKILLS.....69.95	9	
5.1 Mid-Level Skills.....	69.44	6
5.1.1 Workforce with secondary education.....	70.22	26
5.1.2 Population with secondary education.....	72.80	18
5.1.3 Technicians and associate professionals.....	75.32	13
5.1.4 Labour productivity per employee.....	59.42	16
5.2 Employability.....	70.46	21
5.2.1 Ease of finding skilled employees.....	70.04	32
5.2.2 Relevance of education system to the economy.....	58.99	39
5.2.3 Skills matching with secondary education.....	71.30	12
5.2.4 Skills matching with tertiary education.....	81.53	14

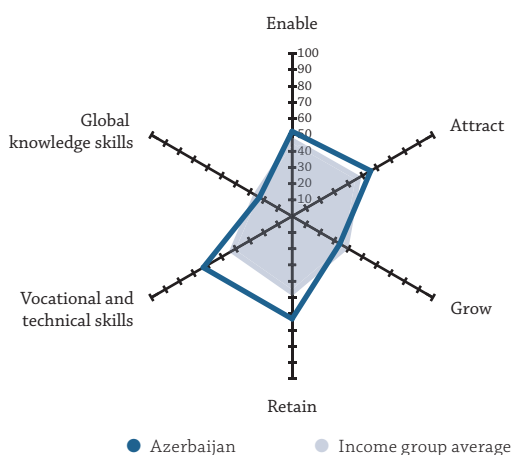
6 GLOBAL KNOWLEDGE SKILLS.....46.71	25	
6.1 High-Level Skills.....	49.31	30
6.1.1 Workforce with tertiary education.....	51.54	32
6.1.2 Population with tertiary education.....	43.32	32
6.1.3 Professionals.....	52.23	21
6.1.4 Researchers.....	62.46	11
6.1.5 Senior officials and managers.....	27.66	54
6.1.6 Availability of scientists and engineers.....	58.63	46
6.2 Talent Impact.....	44.12	28
6.2.1 Innovation output.....	57.27	24
6.2.2 High-value exports.....	29.13	41
6.2.3 New product entrepreneurial activity.....	75.31	10
6.2.4 New business density.....	2.82	80
6.2.5 Scientific journal articles.....	56.08	17

AZERBAIJAN

Key Indicators

Rank (out of 132).....	45
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	9.94

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	52.22	52
1.1 Regulatory Landscape.....	37.51	101
1.1.1 Government effectiveness.....	42.62	83
1.1.2 Rule of law.....	39.69	100
1.1.3 Political stability.....	48.32	106
1.1.4 Regulatory quality.....	42.06	89
1.1.5 Corruption.....	14.86	120
1.2 Market Landscape.....	52.85	61
1.2.1 Competition intensity.....	56.63	101
1.2.2 Ease of doing business.....	85.80	23
1.2.3 Cluster development.....	59.07	32
1.2.4 R&D expenditure.....	3.74	91
1.2.5 ICT infrastructure.....	62.85	60
1.2.6 Urban population.....	49.04	86
1.3 Business and Labour Landscape.....	66.31	26
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	80.98	63
1.3.2 Active labour market policies.....	62.98	35
1.3.3 Labour-employer cooperation.....	57.35	31
1.3.4 Management Practice		
1.3.4 Professional management.....	58.06	43
1.3.5 Relationship of pay to productivity.....	73.56	14
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	64.06	44
1.3.7 Investment in emerging technologies.....	67.18	22
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	55.83	44
2.1 External Openness.....	49.93	42
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	72.44	30
2.1.2 Prevalence of foreign ownership.....	66.12	49
2.1.3 Attract People		
2.1.3 Migrant stock.....	32.78	75
2.1.4 International students.....	7.52	69
2.1.5 Brain gain.....	70.78	18
2.2 Internal Openness.....	61.73	50
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	45.56	65
2.2.2 Tolerance of immigrants.....	58.90	65
2.2.3 Social mobility.....	58.64	59
2.2.4 Gender Equality		
2.2.4 Female graduates.....	74.98	55
2.2.5 Gender development gap.....	70.87	84
2.2.6 Leadership opportunities for women.....	61.41	38

GDP per capita (PPP US\$).....	18,012.32
GDP (US\$ billions).....	46.94
GTCI score.....	48.57
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	33.92	82
3.1 Formal Education.....	14.07	94
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	20.93	85
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	9.58	98
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	38.76	80
3.2.1 Quality of management schools.....	47.07	65
3.2.2 Prevalence of training in firms.....	22.16	79
3.2.3 Employee development.....	47.06	52
3.3 Access to Growth Opportunities.....	48.93	57
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	51.44	54
3.3.2 Personal rights.....	23.21	122
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	87.54	22
3.3.4 Use of virtual professional networks.....	2.08	101
3.3.5 Collaboration within organisations.....	64.09	29
3.3.6 Collaboration across organisations.....	65.25	18

4 RETAIN.....	63.12	35
4.1 Sustainability.....	63.71	31
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	59.90	38
4.1.3 Brain retention.....	67.52	26
4.2 Lifestyle.....	62.53	48
4.2.1 Environmental performance.....	58.18	52
4.2.2 Personal safety.....	49.14	74
4.2.3 Physician density.....	54.25	26
4.2.4 Sanitation.....	88.54	71

5 VOCATIONAL AND TECHNICAL SKILLS.....	63.11	23
5.1 Mid-Level Skills.....	59.94	24
5.1.1 Workforce with secondary education.....	89.47	5
5.1.2 Population with secondary education.....	89.18	4
5.1.3 Technicians and associate professionals.....	40.37	54
5.1.4 Labour productivity per employee.....	20.73	66
5.2 Employability.....	66.28	29
5.2.1 Ease of finding skilled employees.....	71.87	27
5.2.2 Relevance of education system to the economy.....	61.19	37
5.2.3 Skills matching with secondary education.....	66.05	24
5.2.4 Skills matching with tertiary education.....	66.03	37

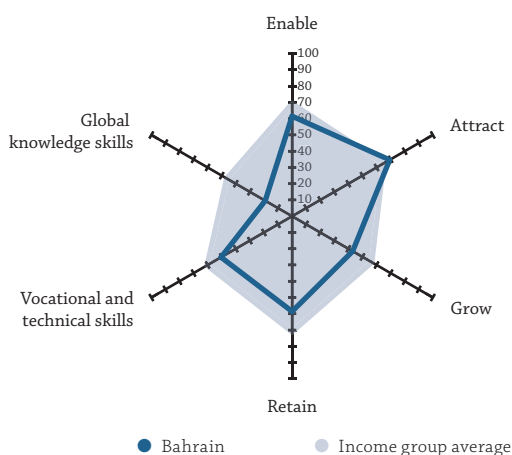
6 GLOBAL KNOWLEDGE SKILLS.....	23.21	74
6.1 High-Level Skills.....	37.83	45
6.1.1 Workforce with tertiary education.....	40.01	46
6.1.2 Population with tertiary education.....	40.06	36
6.1.3 Professionals.....	32.72	51
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	5.93	108
6.1.6 Availability of scientists and engineers.....	70.43	24
6.2 Talent Impact.....	8.59	109
6.2.1 Innovation output.....	21.72	88
6.2.2 High-value exports.....	5.81	99
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	4.92	70
6.2.5 Scientific journal articles.....	1.91	82

BAHRAIN

Key Indicators

Rank (out of 132).....	41
Income group.....	High income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	1.57

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....61.54	34	
1.1 Regulatory Landscape.....	49.27	66
1.1.1 Government effectiveness.....	51.05	60
1.1.2 Rule of law.....	63.10	44
1.1.3 Political stability.....	44.20	113
1.1.4 Regulatory quality.....	58.26	52
1.1.5 Corruption.....	29.73	81
1.2 Market Landscape.....	63.40	31
1.2.1 Competition intensity.....	71.45	59
1.2.2 Ease of doing business.....	70.10	58
1.2.3 Cluster development.....	67.06	25
1.2.4 R&D expenditure.....	1.90	109
1.2.5 ICT infrastructure.....	82.19	20
1.2.6 Urban population.....	87.68	14
1.3 Business and Labour Landscape.....	71.95	18
Labour Market		
1.3.1 Tertiary-educated unemployment.....	92.00	17
1.3.2 Active labour market policies.....	67.33	33
1.3.3 Labour-employer cooperation.....	67.44	18
Management Practice		
1.3.4 Professional management.....	63.54	36
1.3.5 Relationship of pay to productivity.....	70.93	18
Technology Adoption		
1.3.6 Technology utilisation.....	70.44	31
1.3.7 Investment in emerging technologies.....	n/a	n/a
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....69.33	17	
2.1 External Openness.....	71.44	11
Attract Business		
2.1.1 FDI and technology transfer.....	69.65	39
2.1.2 Prevalence of foreign ownership.....	81.33	16
Attract People		
2.1.3 Migrant stock.....	89.66	5
2.1.4 International students.....	48.24	12
2.1.5 Brain gain.....	68.31	21
2.2 Internal Openness.....	67.22	32
Social Inclusion		
2.2.1 Tolerance of minorities.....	11.11	121
2.2.2 Tolerance of immigrants.....	84.93	16
2.2.3 Social mobility.....	78.70	20
Gender Equality		
2.2.4 Female graduates.....	89.59	17
2.2.5 Gender development gap.....	64.38	99
2.2.6 Leadership opportunities for women.....	74.60	19

GDP per capita (PPP US\$).....	47,219.84
GDP (US\$ billions).....	37.75
GTCI score.....	50.35
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....43.05	50	
3.1 Formal Education.....	17.45	87
Enrolment		
3.1.1 Vocational enrolment.....	10.12	85
3.1.2 Tertiary enrolment.....	35.61	64
Quality		
3.1.3 Tertiary education expenditure.....	12.38	92
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	64.31	26
3.2.1 Quality of management schools.....	64.17	33
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	64.45	26
3.3 Access to Growth Opportunities.....	47.39	64
Empowerment		
3.3.1 Delegation of authority.....	57.66	38
3.3.2 Personal rights.....	8.00	127
Collaboration		
3.3.3 Use of virtual social networks.....	89.65	15
3.3.4 Use of virtual professional networks.....	18.06	35
3.3.5 Collaboration within organisations.....	62.32	31
3.3.6 Collaboration across organisations.....	48.65	37

4 RETAIN.....58.60	45	
4.1 Sustainability.....	66.66	27
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	68.21	30
4.1.3 Brain retention.....	65.10	29
4.2 Lifestyle.....	50.55	79
4.2.1 Environmental performance.....	46.21	81
4.2.2 Personal safety.....	41.52	92
4.2.3 Physician density.....	14.48	84
4.2.4 Sanitation.....	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS.....50.46	46	
5.1 Mid-Level Skills.....	33.42	76
5.1.1 Workforce with secondary education.....	11.91	114
5.1.2 Population with secondary education.....	41.05	59
5.1.3 Technicians and associate professionals.....	26.42	76
5.1.4 Labour productivity per employee.....	54.32	22
5.2 Employability.....	67.50	27
5.2.1 Ease of finding skilled employees.....	71.19	29
5.2.2 Relevance of education system to the economy.....	66.47	23
5.2.3 Skills matching with secondary education.....	56.26	38
5.2.4 Skills matching with tertiary education.....	76.08	26

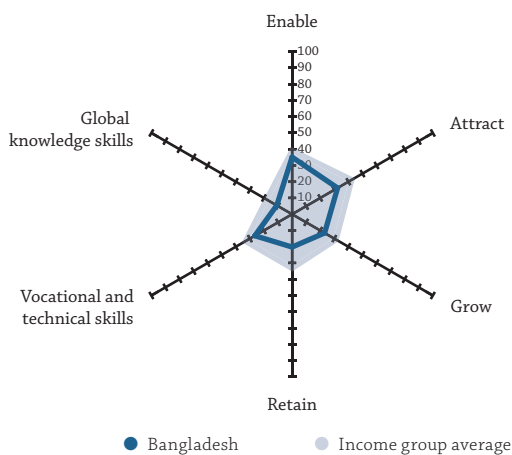
6 GLOBAL KNOWLEDGE SKILLS.....19.09	86	
6.1 High-Level Skills.....	27.68	70
6.1.1 Workforce with tertiary education.....	14.10	96
6.1.2 Population with tertiary education.....	18.18	76
6.1.3 Professionals.....	19.30	81
6.1.4 Researchers.....	4.35	72
6.1.5 Senior officials and managers.....	49.59	24
6.1.6 Availability of scientists and engineers.....	60.55	42
6.2 Talent Impact.....	10.51	105
6.2.1 Innovation output.....	22.59	85
6.2.2 High-value exports.....	3.11	110
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	5.82	65

BANGLADESH

Key Indicators

Rank (out of 132).....	124
Income group.....	Lower-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	161.36

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	35.12	108
1.1 Regulatory Landscape.....	29.54	120
1.1.1 Government effectiveness.....	28.65	115
1.1.2 Rule of law.....	36.99	105
1.1.3 Political stability.....	37.59	122
1.1.4 Regulatory quality.....	28.27	116
1.1.5 Corruption.....	16.22	118
1.2 Market Landscape.....	35.16	109
1.2.1 Competition intensity.....	67.10	70
1.2.2 Ease of doing business.....	20.29	129
1.2.3 Cluster development.....	43.86	58
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	17.43	115
1.2.6 Urban population.....	27.14	112
1.3 Business and Labour Landscape.....	40.65	85
Labour Market		
1.3.1 Tertiary-educated unemployment.....	64.60	95
1.3.2 Active labour market policies.....	25.28	104
1.3.3 Labour-employer cooperation.....	33.92	83
Management Practice		
1.3.4 Professional management.....	40.70	89
1.3.5 Relationship of pay to productivity.....	45.56	75
Technology Adoption		
1.3.6 Technology utilisation.....	45.43	80
1.3.7 Investment in emerging technologies.....	29.07	97
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	32.30	127
2.1 External Openness.....	26.62	118
Attract Business		
2.1.1 FDI and technology transfer.....	44.51	100
2.1.2 Prevalence of foreign ownership.....	41.69	109
Attract People		
2.1.3 Migrant stock.....	16.50	105
2.1.4 International students.....	0.27	108
2.1.5 Brain gain.....	30.14	98
2.2 Internal Openness.....	37.98	126
Social Inclusion		
2.2.1 Tolerance of minorities.....	22.22	103
2.2.2 Tolerance of immigrants.....	72.60	36
2.2.3 Social mobility.....	50.45	85
Gender Equality		
2.2.4 Female graduates.....	0.00	114
2.2.5 Gender development gap.....	46.58	113
2.2.6 Leadership opportunities for women.....	36.04	92

GDP per capita (PPP US\$).....	4,364.05
GDP (US\$ billions).....	274.02
GTCI score.....	24.67
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	23.09	128
3.1 Formal Education.....	10.30	108
Enrolment		
3.1.1 Vocational enrolment.....	6.13	93
3.1.2 Tertiary enrolment.....	13.41	96
Quality		
3.1.3 Tertiary education expenditure.....	9.96	97
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	27.04	123
3.2.1 Quality of management schools.....	36.29	98
3.2.2 Prevalence of training in firms.....	24.41	75
3.2.3 Employee development.....	20.44	122
3.3 Access to Growth Opportunities.....	31.92	118
Empowerment		
3.3.1 Delegation of authority.....	31.86	109
3.3.2 Personal rights.....	47.81	102
Collaboration		
3.3.3 Use of virtual social networks.....	56.29	107
3.3.4 Use of virtual professional networks.....	0.52	120
3.3.5 Collaboration within organisations.....	33.09	109
3.3.6 Collaboration across organisations.....	21.95	116

4 RETAIN.....	20.18	125
4.1 Sustainability.....	15.74	124
4.1.1 Pension system.....	0.85	117
4.1.2 Social protection.....	12.67	126
4.1.3 Brain retention.....	33.69	86
4.2 Lifestyle.....	24.63	116
4.2.1 Environmental performance.....	3.55	130
4.2.2 Personal safety.....	44.83	86
4.2.3 Physician density.....	7.26	97
4.2.4 Sanitation.....	42.88	109

5 VOCATIONAL AND TECHNICAL SKILLS.....	26.45	118
5.1 Mid-Level Skills.....	16.92	109
5.1.1 Workforce with secondary education.....	27.07	95
5.1.2 Population with secondary education.....	27.93	78
5.1.3 Technicians and associate professionals.....	7.21	115
5.1.4 Labour productivity per employee.....	5.49	98
5.2 Employability.....	35.97	105
5.2.1 Ease of finding skilled employees.....	43.09	100
5.2.2 Relevance of education system to the economy.....	37.48	84
5.2.3 Skills matching with secondary education.....	24.81	118
5.2.4 Skills matching with tertiary education.....	38.49	109

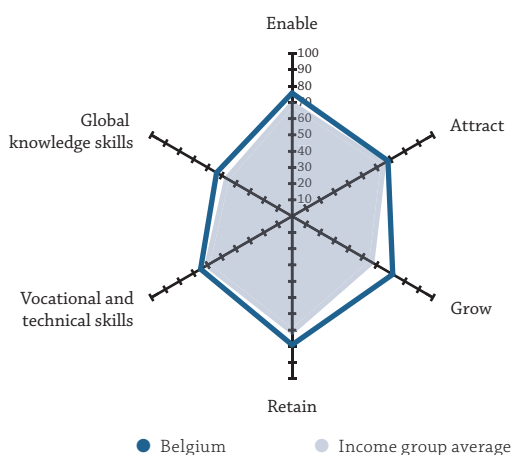
6 GLOBAL KNOWLEDGE SKILLS.....	10.88	115
6.1 High-Level Skills.....	16.80	106
6.1.1 Workforce with tertiary education.....	8.93	105
6.1.2 Population with tertiary education.....	12.75	85
6.1.3 Professionals.....	11.87	107
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	8.40	99
6.1.6 Availability of scientists and engineers.....	42.06	82
6.2 Talent Impact.....	4.95	122
6.2.1 Innovation output.....	15.94	104
6.2.2 High-value exports.....	0.88	120
6.2.3 New product entrepreneurial activity.....	6.94	89
6.2.4 New business density.....	0.39	99
6.2.5 Scientific journal articles.....	0.60	103

BELGIUM

Key Indicators

Rank (out of 132).....	18
Income group.....	High income
Regional group.....	Europe
Population (millions).....	11.42

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....75.80 18		
1.1 Regulatory Landscape.....78.92 20		
1.1.1 Government effectiveness.....75.19 23		
1.1.2 Rule of law.....84.04 20		
1.1.3 Political stability.....74.32 42		
1.1.4 Regulatory quality.....78.63 23		
1.1.5 Corruption.....82.43 16		
1.2 Market Landscape.....79.14 12		
1.2.1 Competition intensity.....85.64 12		
1.2.2 Ease of doing business.....77.42 41		
1.2.3 Cluster development.....74.96 15		
1.2.4 R&D expenditure.....56.81 11		
1.2.5 ICT infrastructure.....82.32 19		
1.2.6 Urban population.....97.70 4		
1.3 Business and Labour Landscape.....69.32 21		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....88.73 31		
1.3.2 Active labour market policies.....71.48 24		
1.3.3 Labour-employer cooperation.....47.88 46		
1.3.4 Management Practice		
1.3.4 Professional management.....87.20 14		
1.3.5 Relationship of pay to productivity.....62.32 43		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....73.73 28		
1.3.7 Investment in emerging technologies.....67.50 20		
1.3.8 Robot density.....55.75 9		
2 ATTRACT.....68.14 21		
2.1 External Openness.....65.19 17		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....76.58 23		
2.1.2 Prevalence of foreign ownership.....90.39 6		
2.1.3 Attract People		
2.1.3 Migrant stock.....55.55 42		
2.1.4 International students.....44.10 13		
2.1.5 Brain gain.....59.34 31		
2.2 Internal Openness.....71.10 25		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....58.89 44		
2.2.2 Tolerance of immigrants.....69.86 43		
2.2.3 Social mobility.....82.65 16		
2.2.4 Gender Equality		
2.2.4 Female graduates.....79.53 36		
2.2.5 Gender development gap.....78.52 60		
2.2.6 Leadership opportunities for women.....57.13 47		

GDP per capita (PPP US\$).....	50,774.91
GDP (US\$ billions).....	531.77
GTGI score.....	68.87
GTGI score (income group average).....	61.46

	Score	Rank
3 GROW.....71.51 10		
3.1 Formal Education.....59.42 7		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....70.49 4		
3.1.2 Tertiary enrolment.....59.80 22		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....34.20 24		
3.1.4 Reading, maths, and science.....76.90 17		
3.1.5 University ranking.....55.71 15		
3.2 Lifelong Learning.....78.51 8		
3.2.1 Quality of management schools.....83.77 7		
3.2.2 Prevalence of training in firms.....n/a n/a		
3.2.3 Employee development.....73.24 16		
3.3 Access to Growth Opportunities.....76.62 12		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....83.52 13		
3.3.2 Personal rights.....97.44 9		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....88.79 16		
3.3.4 Use of virtual professional networks.....51.25 10		
3.3.5 Collaboration within organisations.....79.54 15		
3.3.6 Collaboration across organisations.....59.17 28		

4 RETAIN.....79.14 15		
4.1 Sustainability.....82.73 11		
4.1.1 Pension system.....91.99 13		
4.1.2 Social protection.....98.78 5		
4.1.3 Brain retention.....57.41 36		
4.2 Lifestyle.....75.55 26		
4.2.1 Environmental performance.....83.26 15		
4.2.2 Personal safety.....71.51 32		
4.2.3 Physician density.....47.98 36		
4.2.4 Sanitation.....99.45 21		

5 VOCATIONAL AND TECHNICAL SKILLS.....65.00 18		
5.1 Mid-Level Skills.....57.20 30		
5.1.1 Workforce with secondary education.....52.02 56		
5.1.2 Population with secondary education.....48.12 50		
5.1.3 Technicians and associate professionals.....62.05 22		
5.1.4 Labour productivity per employee.....66.60 9		
5.2 Employability.....72.81 18		
5.2.1 Ease of finding skilled employees.....72.02 26		
5.2.2 Relevance of education system to the economy.....69.31 17		
5.2.3 Skills matching with secondary education.....65.68 25		
5.2.4 Skills matching with tertiary education.....84.23 8		

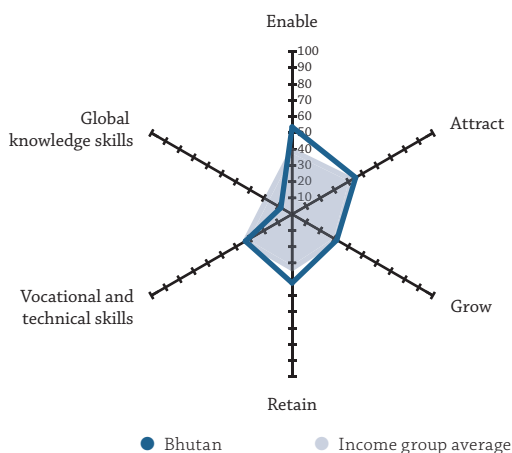
6 GLOBAL KNOWLEDGE SKILLS.....53.65 18		
6.1 High-Level Skills.....58.69 17		
6.1.1 Workforce with tertiary education.....68.50 10		
6.1.2 Population with tertiary education.....51.69 25		
6.1.3 Professionals.....65.93 11		
6.1.4 Researchers.....59.85 14		
6.1.5 Senior officials and managers.....48.66 26		
6.1.6 Availability of scientists and engineers.....57.53 48		
6.2 Talent Impact.....48.60 21		
6.2.1 Innovation output.....58.14 23		
6.2.2 High-value exports.....28.24 43		
6.2.3 New product entrepreneurial activity.....81.42 7		
6.2.4 New business density.....17.88 33		
6.2.5 Scientific journal articles.....57.32 15		

BHUTAN

Key Indicators

Rank (out of 132).....	92
Income group.....	Lower-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	0.75

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....53.71	49	
1.1 Regulatory Landscape.....	66.01	41
1.1.1 Government effectiveness.....	60.06	42
1.1.2 Rule of law.....	67.32	37
1.1.3 Political stability.....	89.77	9
1.1.4 Regulatory quality.....	39.93	95
1.1.5 Corruption.....	72.97	24
1.2 Market Landscape.....	44.39	79
1.2.1 Competition intensity.....	56.51	103
1.2.2 Ease of doing business.....	63.36	75
1.2.3 Cluster development.....	39.38	76
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	30.66	101
1.2.6 Urban population.....	32.04	107
1.3 Business and Labour Landscape.....	50.73	52
Labour Market		
1.3.1 Tertiary-educated unemployment.....	39.65	117
1.3.2 Active labour market policies.....	61.90	37
1.3.3 Labour-employer cooperation.....	62.37	28
Management Practice		
1.3.4 Professional management.....	55.07	53
1.3.5 Relationship of pay to productivity.....	59.41	45
Technology Adoption		
1.3.6 Technology utilisation.....	40.89	96
1.3.7 Investment in emerging technologies.....	35.83	77
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....45.15	85	
2.1 External Openness.....	40.89	73
Attract Business		
2.1.1 FDI and technology transfer.....	40.76	108
2.1.2 Prevalence of foreign ownership.....	22.20	129
Attract People		
2.1.3 Migrant stock.....	51.17	49
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	49.45	48
2.2 Internal Openness.....	49.41	97
Social Inclusion		
2.2.1 Tolerance of minorities.....	16.67	111
2.2.2 Tolerance of immigrants.....	58.90	65
2.2.3 Social mobility.....	72.27	30
Gender Equality		
2.2.4 Female graduates.....	14.93	110
2.2.5 Gender development gap.....	50.65	111
2.2.6 Leadership opportunities for women.....	83.03	8

GDP per capita (PPP US\$).....	10,516.28
GDP (US\$ billions).....	2.53
GTCI score.....	35.66
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....31.74	91	
3.1 Formal Education.....	5.84	122
Enrolment		
3.1.1 Vocational enrolment.....	3.09	106
3.1.2 Tertiary enrolment.....	7.75	105
Quality		
3.1.3 Tertiary education expenditure.....	12.51	91
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	42.55	68
3.2.1 Quality of management schools.....	51.85	55
3.2.2 Prevalence of training in firms.....	29.82	60
3.2.3 Employee development.....	45.98	55
3.3 Access to Growth Opportunities.....	46.85	67
Empowerment		
3.3.1 Delegation of authority.....	52.21	51
3.3.2 Personal rights.....	72.30	70
Collaboration		
3.3.3 Use of virtual social networks.....	59.18	103
3.3.4 Use of virtual professional networks.....	5.53	77
3.3.5 Collaboration within organisations.....	48.28	62
3.3.6 Collaboration across organisations.....	43.58	52

4 RETAIN.....42.27	83	
4.1 Sustainability.....	39.54	70
4.1.1 Pension system.....	12.10	94
4.1.2 Social protection.....	49.74	49
4.1.3 Brain retention.....	56.78	37
4.2 Lifestyle.....	45.01	90
4.2.1 Environmental performance.....	32.99	104
4.2.2 Personal safety.....	81.19	21
4.2.3 Physician density.....	5.81	102
4.2.4 Sanitation.....	60.04	98

5 VOCATIONAL AND TECHNICAL SKILLS.....33.14	99	
5.1 Mid-Level Skills.....	11.77	118
5.1.1 Workforce with secondary education.....	20.61	105
5.1.2 Population with secondary education.....	0.00	115
5.1.3 Technicians and associate professionals.....	14.69	104
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	54.52	50
5.2.1 Ease of finding skilled employees.....	46.89	94
5.2.2 Relevance of education system to the economy.....	63.40	28
5.2.3 Skills matching with secondary education.....	47.79	52
5.2.4 Skills matching with tertiary education.....	60.00	55

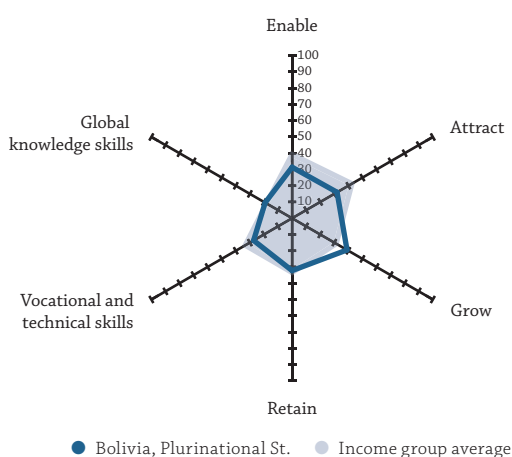
6 GLOBAL KNOWLEDGE SKILLS.....7.97	126	
6.1 High-Level Skills.....	15.08	112
6.1.1 Workforce with tertiary education.....	6.82	113
6.1.2 Population with tertiary education.....	5.68	97
6.1.3 Professionals.....	22.16	75
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	10.84	90
6.1.6 Availability of scientists and engineers.....	29.92	115
6.2 Talent Impact.....	0.85	128
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	0.06	126
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	0.37	100
6.2.5 Scientific journal articles.....	2.12	81

BOLIVIA, PLURINATIONAL ST.

Key Indicators

Rank (out of 132).....	107
Income group.....	Lower-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	11.35

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	31.40	121
1.1 Regulatory Landscape.....	33.24	111
1.1.1 Government effectiveness.....	37.07	95
1.1.2 Rule of law.....	24.45	126
1.1.3 Political stability.....	58.36	85
1.1.4 Regulatory quality.....	26.03	121
1.1.5 Corruption.....	20.27	107
1.2 Market Landscape.....	35.96	105
1.2.1 Competition intensity.....	60.89	84
1.2.2 Ease of doing business.....	35.21	121
1.2.3 Cluster development.....	16.82	122
1.2.4 R&D expenditure.....	3.12	93
1.2.5 ICT infrastructure.....	34.86	94
1.2.6 Urban population.....	64.84	53
1.3 Business and Labour Landscape.....	24.99	125
Labour Market		
1.3.1 Tertiary-educated unemployment.....	80.25	65
1.3.2 Active labour market policies.....	6.80	127
1.3.3 Labour-employer cooperation.....	10.49	124
Management Practice		
1.3.4 Professional management.....	24.07	123
1.3.5 Relationship of pay to productivity.....	16.92	127
Technology Adoption		
1.3.6 Technology utilisation.....	24.40	121
1.3.7 Investment in emerging technologies.....	12.03	127
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	31.96	128
2.1 External Openness.....	23.85	125
Attract Business		
2.1.1 FDI and technology transfer.....	30.39	127
2.1.2 Prevalence of foreign ownership.....	25.92	125
Attract People		
2.1.3 Migrant stock.....	20.02	101
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	19.07	120
2.2 Internal Openness.....	40.07	121
Social Inclusion		
2.2.1 Tolerance of minorities.....	51.11	58
2.2.2 Tolerance of immigrants.....	57.53	69
2.2.3 Social mobility.....	19.53	131
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	63.47	100
2.2.6 Leadership opportunities for women.....	8.72	131

GDP per capita (PPP US\$).....	7,859.28
GDP (US\$ billions).....	40.29
GTGI score.....	30.18
GTGI score (income group average).....	32.97

	Score	Rank
3 GROW.....	39.02	64
3.1 Formal Education.....	48.70	21
Enrolment		
3.1.1 Vocational enrolment.....	100.00	1
3.1.2 Tertiary enrolment.....	n/a	n/a
Quality		
3.1.3 Tertiary education expenditure.....	46.09	7
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	35.19	94
3.2.1 Quality of management schools.....	29.30	115
3.2.2 Prevalence of training in firms.....	61.35	21
3.2.3 Employee development.....	14.93	125
3.3 Access to Growth Opportunities.....	33.16	115
Empowerment		
3.3.1 Delegation of authority.....	24.40	119
3.3.2 Personal rights.....	72.72	68
Collaboration		
3.3.3 Use of virtual social networks.....	55.36	109
3.3.4 Use of virtual professional networks.....	4.98	82
3.3.5 Collaboration within organisations.....	21.42	130
3.3.6 Collaboration across organisations.....	20.09	120

4 RETAIN.....	32.23	102
4.1 Sustainability.....	25.19	111
4.1.1 Pension system.....	16.66	85
4.1.2 Social protection.....	34.33	83
4.1.3 Brain retention.....	24.58	106
4.2 Lifestyle.....	39.27	98
4.2.1 Environmental performance.....	47.59	79
4.2.2 Personal safety.....	53.20	67
4.2.3 Physician density.....	7.28	96
4.2.4 Sanitation.....	49.00	105

5 VOCATIONAL AND TECHNICAL SKILLS.....	27.34	114
5.1 Mid-Level Skills.....	21.65	99
5.1.1 Workforce with secondary education.....	32.70	84
5.1.2 Population with secondary education.....	25.30	82
5.1.3 Technicians and associate professionals.....	20.06	91
5.1.4 Labour productivity per employee.....	8.56	88
5.2 Employability.....	33.02	114
5.2.1 Ease of finding skilled employees.....	38.89	110
5.2.2 Relevance of education system to the economy.....	19.73	124
5.2.3 Skills matching with secondary education.....	32.46	95
5.2.4 Skills matching with tertiary education.....	41.00	104

6 GLOBAL KNOWLEDGE SKILLS.....	19.14	85
6.1 High-Level Skills.....	20.83	91
6.1.1 Workforce with tertiary education.....	29.82	63
6.1.2 Population with tertiary education.....	37.66	40
6.1.3 Professionals.....	18.17	88
6.1.4 Researchers.....	1.89	82
6.1.5 Senior officials and managers.....	13.45	83
6.1.6 Availability of scientists and engineers.....	24.00	122
6.2 Talent Impact.....	17.44	80
6.2.1 Innovation output.....	15.24	110
6.2.2 High-value exports.....	14.46	73
6.2.3 New product entrepreneurial activity.....	54.65	37
6.2.4 New business density.....	2.56	82
6.2.5 Scientific journal articles.....	0.30	116

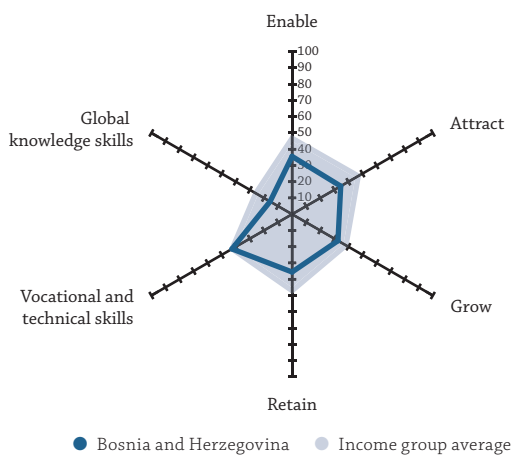
BOSNIA AND HERZEGOVINA

Key Indicators

Rank (out of 132).....	101
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	3.32

GDP per capita (PPP US\$)	13,735.03
GDP (US\$ billions)	19.78
GTCI score.....	32.77
GTCI score (income group average)	41.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	35.58	106
1.1 Regulatory Landscape.....	43.21	84
1.1.1 Government effectiveness.....	34.85	97
1.1.2 Rule of law.....	47.73	74
1.1.3 Political stability.....	56.63	88
1.1.4 Regulatory quality.....	44.41	81
1.1.5 Corruption.....	32.43	73
1.2 Market Landscape.....	40.35	95
1.2.1 Competition intensity.....	57.68	96
1.2.2 Ease of doing business.....	59.32	82
1.2.3 Cluster development.....	27.61	100
1.2.4 R&D expenditure.....	4.05	90
1.2.5 ICT infrastructure.....	52.93	71
1.2.6 Urban population.....	40.49	99
1.3 Business and Labour Landscape.....	23.20	128
Labour Market		
1.3.1 Tertiary-educated unemployment.....	49.26	112
1.3.2 Active labour market policies.....	27.03	99
1.3.3 Labour-employer cooperation.....	10.86	121
Management Practice		
1.3.4 Professional management.....	20.46	127
1.3.5 Relationship of pay to productivity.....	23.57	126
Technology Adoption		
1.3.6 Technology utilisation.....	36.85	105
1.3.7 Investment in emerging technologies.....	16.99	124
1.3.8 Robot density.....	0.55	57
2 ATTRACT.....	34.56	121
2.1 External Openness.....	24.81	122
Attract Business		
2.1.1 FDI and technology transfer.....	37.96	115
2.1.2 Prevalence of foreign ownership.....	40.49	112
Attract People		
2.1.3 Migrant stock.....	15.34	107
2.1.4 International students.....	26.06	28
2.1.5 Brain gain.....	4.21	131
2.2 Internal Openness.....	44.31	112
Social Inclusion		
2.2.1 Tolerance of minorities.....	31.11	90
2.2.2 Tolerance of immigrants.....	31.51	107
2.2.3 Social mobility.....	32.22	126
Gender Equality		
2.2.4 Female graduates.....	77.85	43
2.2.5 Gender development gap.....	61.77	104
2.2.6 Leadership opportunities for women.....	31.38	101

	Score	Rank
3 GROW.....	32.60	87
3.1 Formal Education.....	29.39	57
Enrolment		
3.1.1 Vocational enrolment.....	58.78	8
3.1.2 Tertiary enrolment.....	n/a	n/a
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	34.06	101
3.2.1 Quality of management schools.....	25.33	121
3.2.2 Prevalence of training in firms.....	64.64	18
3.2.3 Employee development.....	12.19	127
3.3 Access to Growth Opportunities.....	34.37	111
Empowerment		
3.3.1 Delegation of authority.....	19.55	123
3.3.2 Personal rights.....	65.54	83
Collaboration		
3.3.3 Use of virtual social networks.....	67.07	88
3.3.4 Use of virtual professional networks.....	6.07	75
3.3.5 Collaboration within organisations.....	30.75	114
3.3.6 Collaboration across organisations.....	17.22	126

4 RETAIN.....	35.55	96
4.1 Sustainability.....	19.34	121
4.1.1 Pension system.....	44.60	58
4.1.2 Social protection.....	11.87	127
4.1.3 Brain retention.....	1.55	131
4.2 Lifestyle.....	51.75	72
4.2.1 Environmental performance.....	24.02	119
4.2.2 Personal safety.....	58.66	58
4.2.3 Physician density.....	29.94	60
4.2.4 Sanitation.....	94.38	57

5 VOCATIONAL AND TECHNICAL SKILLS.....	42.69	70
5.1 Mid-Level Skills.....	60.62	22
5.1.1 Workforce with secondary education.....	97.52	2
5.1.2 Population with secondary education.....	72.12	19
5.1.3 Technicians and associate professionals.....	39.83	55
5.1.4 Labour productivity per employee.....	32.99	53
5.2 Employability.....	24.76	129
5.2.1 Ease of finding skilled employees.....	32.75	124
5.2.2 Relevance of education system to the economy.....	15.79	127
5.2.3 Skills matching with secondary education.....	23.75	119
5.2.4 Skills matching with tertiary education.....	26.76	126

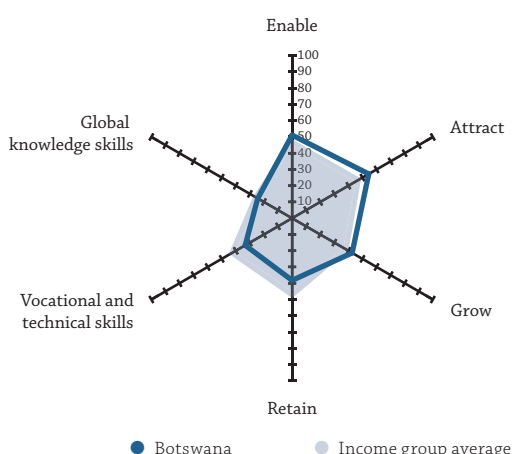
6 GLOBAL KNOWLEDGE SKILLS.....	15.64	98
6.1 High-Level Skills.....	19.11	95
6.1.1 Workforce with tertiary education.....	18.63	88
6.1.2 Population with tertiary education.....	16.42	77
6.1.3 Professionals.....	29.56	58
6.1.4 Researchers.....	5.50	70
6.1.5 Senior officials and managers.....	13.68	82
6.1.6 Availability of scientists and engineers.....	30.85	113
6.2 Talent Impact.....	12.18	97
6.2.1 Innovation output.....	24.52	78
6.2.2 High-value exports.....	8.71	88
6.2.3 New product entrepreneurial activity.....	16.32	83
6.2.4 New business density.....	5.41	67
6.2.5 Scientific journal articles.....	5.91	64

BOTSWANA

Key Indicators

Rank (out of 132).....	71
Income group.....	Upper-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	2.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	51.16	53
1.1 Regulatory Landscape.....	66.42	40
1.1.1 Government effectiveness.....	56.85	46
1.1.2 Rule of law.....	64.67	41
1.1.3 Political stability.....	87.61	16
1.1.4 Regulatory quality.....	59.49	46
1.1.5 Corruption.....	63.51	29
1.2 Market Landscape.....	43.26	85
1.2.1 Competition intensity.....	57.37	99
1.2.2 Ease of doing business.....	62.15	80
1.2.3 Cluster development.....	22.74	112
1.2.4 R&D expenditure.....	11.46	57
1.2.5 ICT infrastructure.....	40.97	83
1.2.6 Urban population.....	64.87	52
1.3 Business and Labour Landscape.....	43.81	72
Labour Market		
1.3.1 Tertiary-educated unemployment.....	77.30	71
1.3.2 Active labour market policies.....	31.75	86
1.3.3 Labour-employer cooperation.....	35.44	77
Management Practice		
1.3.4 Professional management.....	57.10	45
1.3.5 Relationship of pay to productivity.....	37.26	97
Technology Adoption		
1.3.6 Technology utilisation.....	36.97	104
1.3.7 Investment in emerging technologies.....	30.84	94
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	54.46	47
2.1 External Openness.....	46.22	56
Attract Business		
2.1.1 FDI and technology transfer.....	42.99	104
2.1.2 Prevalence of foreign ownership.....	72.12	38
Attract People		
2.1.3 Migrant stock.....	52.51	46
2.1.4 International students.....	9.81	64
2.1.5 Brain gain.....	53.67	41
2.2 Internal Openness.....	62.71	47
Social Inclusion		
2.2.1 Tolerance of minorities.....	63.33	38
2.2.2 Tolerance of immigrants.....	71.23	38
2.2.3 Social mobility.....	59.77	56
Gender Equality		
2.2.4 Female graduates.....	48.74	96
2.2.5 Gender development gap.....	80.23	52
2.2.6 Leadership opportunities for women.....	52.94	53

GDP per capita (PPP US\$).....	18,582.97
GDP (US\$ billions).....	18.62
GTCI score.....	40.71
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	42.67	51
3.1 Formal Education.....	39.23	37
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	17.70	87
Quality		
3.1.3 Tertiary education expenditure.....	100.00	1
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	45.26	62
3.2.1 Quality of management schools.....	32.26	109
3.2.2 Prevalence of training in firms.....	63.98	19
3.2.3 Employee development.....	39.54	64
3.3 Access to Growth Opportunities.....	43.53	84
Empowerment		
3.3.1 Delegation of authority.....	49.26	60
3.3.2 Personal rights.....	82.28	49
Collaboration		
3.3.3 Use of virtual social networks.....	59.41	102
3.3.4 Use of virtual professional networks.....	10.09	59
3.3.5 Collaboration within organisations.....	34.61	104
3.3.6 Collaboration across organisations.....	25.51	106

4 RETAIN.....	38.23	93
4.1 Sustainability.....	35.82	80
4.1.1 Pension system.....	15.50	87
4.1.2 Social protection.....	45.93	60
4.1.3 Brain retention.....	46.05	50
4.2 Lifestyle.....	40.64	96
4.2.1 Environmental performance.....	40.46	92
4.2.2 Personal safety.....	59.33	56
4.2.3 Physician density.....	5.85	101
4.2.4 Sanitation.....	56.91	100

5 VOCATIONAL AND TECHNICAL SKILLS.....	33.29	98
5.1 Mid-Level Skills.....	28.11	91
5.1.1 Workforce with secondary education.....	22.72	103
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	33.51	62
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	38.47	94
5.2.1 Ease of finding skilled employees.....	48.21	87
5.2.2 Relevance of education system to the economy.....	41.44	73
5.2.3 Skills matching with secondary education.....	25.43	115
5.2.4 Skills matching with tertiary education.....	38.78	108

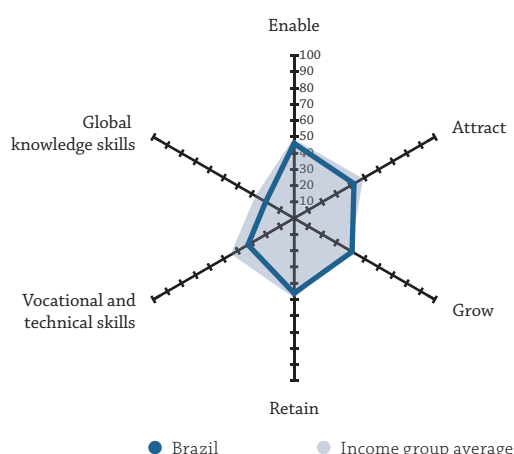
6 GLOBAL KNOWLEDGE SKILLS.....	24.41	72
6.1 High-Level Skills.....	19.63	94
6.1.1 Workforce with tertiary education.....	23.33	77
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	17.06	91
6.1.4 Researchers.....	2.05	81
6.1.5 Senior officials and managers.....	19.31	69
6.1.6 Availability of scientists and engineers.....	36.40	99
6.2 Talent Impact.....	29.19	51
6.2.1 Innovation output.....	13.31	114
6.2.2 High-value exports.....	2.64	113
6.2.3 New product entrepreneurial activity.....	37.44	59
6.2.4 New business density.....	88.46	2
6.2.5 Scientific journal articles.....	4.12	74

BRAZIL

Key Indicators

Rank (out of 132).....	80
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	209.47

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....46.01	79	
1.1 Regulatory Landscape.....	43.07	85
1.1.1 Government effectiveness.....	39.56	88
1.1.2 Rule of law.....	46.02	80
1.1.3 Political stability.....	56.12	89
1.1.4 Regulatory quality.....	45.28	75
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	56.63	47
1.2.1 Competition intensity.....	68.26	66
1.2.2 Ease of doing business.....	52.52	93
1.2.3 Cluster development.....	48.85	48
1.2.4 R&D expenditure.....	27.43	28
1.2.5 ICT infrastructure.....	58.14	66
1.2.6 Urban population.....	84.56	19
1.3 Business and Labour Landscape.....	38.32	91
Labour Market		
1.3.1 Tertiary-educated unemployment.....	77.44	70
1.3.2 Active labour market policies.....	26.54	102
1.3.3 Labour-employer cooperation.....	19.32	112
Management Practice		
1.3.4 Professional management.....	53.56	57
1.3.5 Relationship of pay to productivity.....	33.33	110
Technology Adoption		
1.3.6 Technology utilisation.....	53.43	57
1.3.7 Investment in emerging technologies.....	38.96	63
1.3.8 Robot density.....	4.01	42
2 ATTRACT.....42.56	96	
2.1 External Openness.....	28.93	115
Attract Business		
2.1.1 FDI and technology transfer.....	61.16	57
2.1.2 Prevalence of foreign ownership.....	48.57	95
Attract People		
2.1.3 Migrant stock.....	7.04	123
2.1.4 International students.....	0.78	104
2.1.5 Brain gain.....	27.12	105
2.2 Internal Openness.....	56.18	64
Social Inclusion		
2.2.1 Tolerance of minorities.....	33.33	85
2.2.2 Tolerance of immigrants.....	69.86	43
2.2.3 Social mobility.....	48.62	93
Gender Equality		
2.2.4 Female graduates.....	82.25	30
2.2.5 Gender development gap.....	86.13	24
2.2.6 Leadership opportunities for women.....	16.88	123

GDP per capita (PPP US\$).....	16,068.02
GDP (US\$ billions).....	1,868.63
GTCI score.....	38.14
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....41.22	55	
3.1 Formal Education.....	29.39	56
Enrolment		
3.1.1 Vocational enrolment.....	6.37	92
3.1.2 Tertiary enrolment.....	39.58	55
Quality		
3.1.3 Tertiary education expenditure.....	31.34	30
3.1.4 Reading, maths, and science.....	26.34	62
3.1.5 University ranking.....	43.34	27
3.2 Lifelong Learning.....	40.68	74
3.2.1 Quality of management schools.....	35.04	105
3.2.2 Prevalence of training in firms.....	51.19	28
3.2.3 Employee development.....	35.81	73
3.3 Access to Growth Opportunities.....	53.58	41
Empowerment		
3.3.1 Delegation of authority.....	49.34	59
3.3.2 Personal rights.....	78.16	58
Collaboration		
3.3.3 Use of virtual social networks.....	80.99	44
3.3.4 Use of virtual professional networks.....	27.15	26
3.3.5 Collaboration within organisations.....	44.48	78
3.3.6 Collaboration across organisations.....	41.34	58

4 RETAIN.....46.12	70	
4.1 Sustainability.....	43.21	61
4.1.1 Pension system.....	52.48	50
4.1.2 Social protection.....	37.42	79
4.1.3 Brain retention.....	39.72	70
4.2 Lifestyle.....	49.04	84
4.2.1 Environmental performance.....	55.46	61
4.2.2 Personal safety.....	26.22	119
4.2.3 Physician density.....	29.39	62
4.2.4 Sanitation.....	85.09	76

5 VOCATIONAL AND TECHNICAL SKILLS.....32.74	101	
5.1 Mid-Level Skills.....	37.58	69
5.1.1 Workforce with secondary education.....	57.62	45
5.1.2 Population with secondary education.....	41.89	58
5.1.3 Technicians and associate professionals.....	32.73	64
5.1.4 Labour productivity per employee.....	18.08	73
5.2 Employability.....	27.91	123
5.2.1 Ease of finding skilled employees.....	33.59	121
5.2.2 Relevance of education system to the economy.....	15.86	126
5.2.3 Skills matching with secondary education.....	29.60	105
5.2.4 Skills matching with tertiary education.....	32.58	123

6 GLOBAL KNOWLEDGE SKILLS.....20.18	81	
6.1 High-Level Skills.....	25.10	79
6.1.1 Workforce with tertiary education.....	30.75	62
6.1.2 Population with tertiary education.....	20.49	72
6.1.3 Professionals.....	28.35	62
6.1.4 Researchers.....	10.57	52
6.1.5 Senior officials and managers.....	26.49	57
6.1.6 Availability of scientists and engineers.....	33.96	109
6.2 Talent Impact.....	15.26	86
6.2.1 Innovation output.....	28.90	66
6.2.2 High-value exports.....	36.57	31
6.2.3 New product entrepreneurial activity.....	0.00	90
6.2.4 New business density.....	0.57	97
6.2.5 Scientific journal articles.....	10.27	52

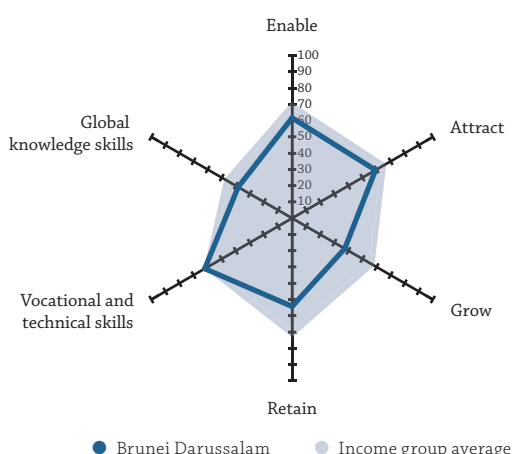
BRUNEI DARUSSALAM

Key Indicators

Rank (out of 132).....	38
Income group.....	High income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	0.43

GDP per capita (PPP US\$)	80,777.55
GDP (US\$ billions)	13.57
GTCI score.....	52.17
GTCI score (income group average)	61.46

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	61.72	33
1.1 Regulatory Landscape.....	73.01	28
1.1.1 Government effectiveness.....	74.28	25
1.1.2 Rule of law.....	67.77	36
1.1.3 Political stability.....	91.12	7
1.1.4 Regulatory quality.....	65.65	37
1.1.5 Corruption.....	66.22	27
1.2 Market Landscape.....	62.62	34
1.2.1 Competition intensity.....	56.42	104
1.2.2 Ease of doing business.....	73.99	51
1.2.3 Cluster development.....	34.77	88
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	73.66	37
1.2.6 Urban population.....	74.28	39
1.3 Business and Labour Landscape.....	49.54	56
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	75.39	81
1.3.2 Active labour market policies.....	54.38	48
1.3.3 Labour-employer cooperation.....	56.75	32
1.3.4 Management Practice		
1.3.4.1 Professional management.....	45.21	78
1.3.5 Relationship of pay to productivity.....	45.60	74
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	46.25	76
1.3.7 Investment in emerging technologies.....	23.20	112
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	59.25	37
2.1 External Openness.....	48.45	51
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	52.68	79
2.1.2 Prevalence of foreign ownership.....	48.68	94
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	75.90	13
2.1.4 International students.....	13.73	51
2.1.5 Brain gain.....	51.27	44
2.2 Internal Openness.....	70.06	26
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	45.56	65
2.2.2 Tolerance of immigrants.....	n/a	n/a
2.2.3 Social mobility.....	63.85	44
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	89.62	16
2.2.5 Gender development gap.....	85.51	30
2.2.6 Leadership opportunities for women.....	65.76	32

	Score	Rank
3 GROW.....	37.41	69
3.1 Formal Education.....	22.91	72
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	15.51	68
3.1.2 Tertiary enrolment.....	25.59	77
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	18.36	72
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	32.20	37
3.2 Lifelong Learning.....	45.73	61
3.2.1 Quality of management schools.....	49.16	61
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	42.30	58
3.3 Access to Growth Opportunities.....	43.59	83
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	52.03	52
3.3.2 Personal rights.....	n/a	n/a
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	88.64	17
3.3.4 Use of virtual professional networks.....	14.46	48
3.3.5 Collaboration within organisations.....	33.24	108
3.3.6 Collaboration across organisations.....	29.58	93

4 RETAIN.....	54.27	55
4.1 Sustainability.....	47.22	52
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	50.80	48
4.1.3 Brain retention.....	43.63	59
4.2 Lifestyle.....	61.33	50
4.2.1 Environmental performance.....	60.24	48
4.2.2 Personal safety.....	n/a	n/a
4.2.3 Physician density.....	27.69	67
4.2.4 Sanitation.....	96.05	49

5 VOCATIONAL AND TECHNICAL SKILLS.....	62.04	25
5.1 Mid-Level Skills.....	69.67	5
5.1.1 Workforce with secondary education.....	78.65	14
5.1.2 Population with secondary education.....	70.03	22
5.1.3 Technicians and associate professionals.....	60.32	25
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	54.41	51
5.2.1 Ease of finding skilled employees.....	41.99	103
5.2.2 Relevance of education system to the economy.....	63.33	29
5.2.3 Skills matching with secondary education.....	51.99	45
5.2.4 Skills matching with tertiary education.....	60.33	53

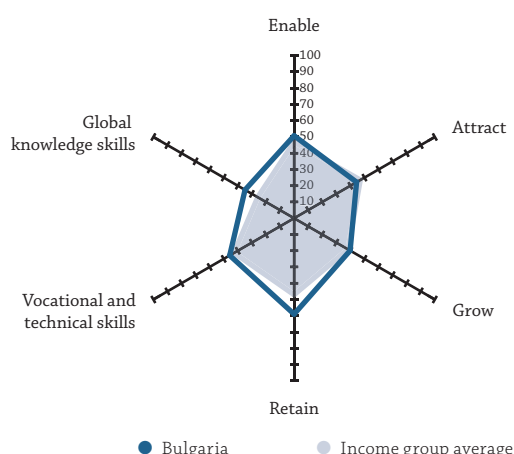
6 GLOBAL KNOWLEDGE SKILLS.....	38.33	37
6.1 High-Level Skills.....	43.43	39
6.1.1 Workforce with tertiary education.....	30.87	61
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	44.47	34
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	60.63	16
6.1.6 Availability of scientists and engineers.....	37.75	96
6.2 Talent Impact.....	33.23	44
6.2.1 Innovation output.....	11.56	116
6.2.2 High-value exports.....	89.03	4
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	11.90	43
6.2.5 Scientific journal articles.....	20.44	41

BULGARIA

Key Indicators

Rank (out of 132).....	55
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	7.02

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	50.76	55
1.1 Regulatory Landscape.....	55.81	52
1.1.1 Government effectiveness.....	52.87	52
1.1.2 Rule of law.....	51.71	67
1.1.3 Political stability.....	73.21	46
1.1.4 Regulatory quality.....	63.45	42
1.1.5 Corruption.....	37.84	62
1.2 Market Landscape.....	55.46	53
1.2.1 Competition intensity.....	63.07	80
1.2.2 Ease of doing business.....	72.58	55
1.2.3 Cluster development.....	43.77	59
1.2.4 R&D expenditure.....	16.58	46
1.2.5 ICT infrastructure.....	65.52	56
1.2.6 Urban population.....	71.26	43
1.3 Business and Labour Landscape.....	41.00	83
Labour Market		
1.3.1 Tertiary-educated unemployment.....	92.48	14
1.3.2 Active labour market policies.....	44.98	63
1.3.3 Labour-employer cooperation.....	18.62	113
Management Practice		
1.3.4 Professional management.....	30.85	109
1.3.5 Relationship of pay to productivity.....	43.57	78
Technology Adoption		
1.3.6 Technology utilisation.....	48.58	70
1.3.7 Investment in emerging technologies.....	46.61	49
1.3.8 Robot density.....	2.34	44
2 ATTRACT.....	44.40	91
2.1 External Openness.....	35.39	93
Attract Business		
2.1.1 FDI and technology transfer.....	58.46	63
2.1.2 Prevalence of foreign ownership.....	55.49	72
Attract People		
2.1.3 Migrant stock.....	21.77	97
2.1.4 International students.....	16.72	41
2.1.5 Brain gain.....	24.54	110
2.2 Internal Openness.....	53.41	82
Social Inclusion		
2.2.1 Tolerance of minorities.....	57.78	45
2.2.2 Tolerance of immigrants.....	9.59	126
2.2.3 Social mobility.....	41.81	112
Gender Equality		
2.2.4 Female graduates.....	83.52	26
2.2.5 Gender development gap.....	85.37	31
2.2.6 Leadership opportunities for women.....	42.36	76

GDP per capita (PPP US\$).....	20,948.10
GDP (US\$ billions).....	65.13
GTGI score.....	45.76
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	39.80	63
3.1 Formal Education.....	35.44	43
Enrolment		
3.1.1 Vocational enrolment.....	45.51	20
3.1.2 Tertiary enrolment.....	56.09	25
Quality		
3.1.3 Tertiary education expenditure.....	13.46	89
3.1.4 Reading, maths, and science.....	47.29	43
3.1.5 University ranking.....	14.86	59
3.2 Lifelong Learning.....	36.55	89
3.2.1 Quality of management schools.....	33.81	107
3.2.2 Prevalence of training in firms.....	51.85	27
3.2.3 Employee development.....	24.01	115
3.3 Access to Growth Opportunities.....	47.40	63
Empowerment		
3.3.1 Delegation of authority.....	35.39	95
3.3.2 Personal rights.....	82.06	50
Collaboration		
3.3.3 Use of virtual social networks.....	71.03	76
3.3.4 Use of virtual professional networks.....	10.56	58
3.3.5 Collaboration within organisations.....	45.74	72
3.3.6 Collaboration across organisations.....	39.65	65

4 RETAIN.....	59.01	43
4.1 Sustainability.....	46.28	54
4.1.1 Pension system.....	84.97	22
4.1.2 Social protection.....	32.80	88
4.1.3 Brain retention.....	21.08	114
4.2 Lifestyle.....	71.73	32
4.2.1 Environmental performance.....	67.38	29
4.2.2 Personal safety.....	70.81	34
4.2.3 Physician density.....	63.82	11
4.2.4 Sanitation.....	84.91	78

5 VOCATIONAL AND TECHNICAL SKILLS.....	45.74	60
5.1 Mid-Level Skills.....	53.83	40
5.1.1 Workforce with secondary education.....	76.49	18
5.1.2 Population with secondary education.....	71.66	20
5.1.3 Technicians and associate professionals.....	40.67	53
5.1.4 Labour productivity per employee.....	26.48	59
5.2 Employability.....	37.64	98
5.2.1 Ease of finding skilled employees.....	34.36	116
5.2.2 Relevance of education system to the economy.....	40.89	75
5.2.3 Skills matching with secondary education.....	38.31	78
5.2.4 Skills matching with tertiary education.....	37.02	113

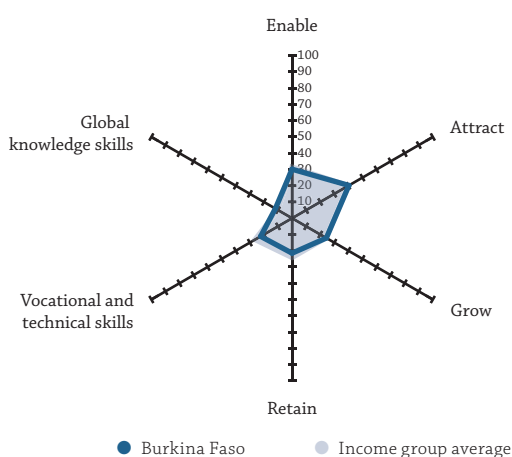
6 GLOBAL KNOWLEDGE SKILLS.....	34.86	43
6.1 High-Level Skills.....	37.65	46
6.1.1 Workforce with tertiary education.....	46.05	36
6.1.2 Population with tertiary education.....	38.68	39
6.1.3 Professionals.....	43.40	38
6.1.4 Researchers.....	25.73	37
6.1.5 Senior officials and managers.....	33.20	43
6.1.6 Availability of scientists and engineers.....	38.85	94
6.2 Talent Impact.....	32.07	46
6.2.1 Innovation output.....	45.88	37
6.2.2 High-value exports.....	22.56	52
6.2.3 New product entrepreneurial activity.....	25.28	73
6.2.4 New business density.....	52.42	10
6.2.5 Scientific journal articles.....	14.19	49

BURKINA FASO

Key Indicators

Rank (out of 132).....	122
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	19.75

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	30.16	124
1.1 Regulatory Landscape.....	38.78	97
1.1.1 Government effectiveness.....	32.27	103
1.1.2 Rule of law.....	43.22	89
1.1.3 Political stability.....	44.71	111
1.1.4 Regulatory quality.....	37.20	101
1.1.5 Corruption.....	36.49	63
1.2 Market Landscape.....	26.07	125
1.2.1 Competition intensity.....	50.63	116
1.2.2 Ease of doing business.....	37.44	118
1.2.3 Cluster development.....	20.67	119
1.2.4 R&D expenditure.....	14.38	50
1.2.5 ICT infrastructure.....	14.50	118
1.2.6 Urban population.....	18.77	120
1.3 Business and Labour Landscape.....	25.65	123
Labour Market		
1.3.1 Tertiary-educated unemployment.....	62.11	99
1.3.2 Active labour market policies.....	8.12	124
1.3.3 Labour-employer cooperation.....	26.81	98
Management Practice		
1.3.4 Professional management.....	16.14	129
1.3.5 Relationship of pay to productivity.....	16.65	128
Technology Adoption		
1.3.6 Technology utilisation.....	25.79	119
1.3.7 Investment in emerging technologies.....	23.92	108
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	40.35	106
2.1 External Openness.....	35.04	94
Attract Business		
2.1.1 FDI and technology transfer.....	41.08	107
2.1.2 Prevalence of foreign ownership.....	46.50	99
Attract People		
2.1.3 Migrant stock.....	45.40	53
2.1.4 International students.....	10.56	60
2.1.5 Brain gain.....	31.64	96
2.2 Internal Openness.....	45.67	107
Social Inclusion		
2.2.1 Tolerance of minorities.....	67.78	32
2.2.2 Tolerance of immigrants.....	75.34	30
2.2.3 Social mobility.....	60.68	52
Gender Equality		
2.2.4 Female graduates.....	13.12	112
2.2.5 Gender development gap.....	42.70	117
2.2.6 Leadership opportunities for women.....	14.38	127

GDP per capita (PPP US\$).....	1,975.04
GDP (US\$ billions).....	14.44
GTCI score.....	25.09
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....	24.33	120
3.1 Formal Education.....	12.17	101
Enrolment		
3.1.1 Vocational enrolment.....	3.93	101
3.1.2 Tertiary enrolment.....	4.16	118
Quality		
3.1.3 Tertiary education expenditure.....	40.60	13
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	28.11	121
3.2.1 Quality of management schools.....	40.32	87
3.2.2 Prevalence of training in firms.....	28.23	66
3.2.3 Employee development.....	15.79	124
3.3 Access to Growth Opportunities.....	32.69	117
Empowerment		
3.3.1 Delegation of authority.....	16.17	128
3.3.2 Personal rights.....	67.50	80
Collaboration		
3.3.3 Use of virtual social networks.....	44.13	120
3.3.4 Use of virtual professional networks.....	0.59	118
3.3.5 Collaboration within organisations.....	44.44	80
3.3.6 Collaboration across organisations.....	23.34	111

4 RETAIN.....	21.51	121
4.1 Sustainability.....	19.49	120
4.1.1 Pension system.....	2.26	114
4.1.2 Social protection.....	26.57	106
4.1.3 Brain retention.....	29.63	98
4.2 Lifestyle.....	23.54	119
4.2.1 Environmental performance.....	25.67	117
4.2.2 Personal safety.....	51.40	70
4.2.3 Physician density.....	0.45	123
4.2.4 Sanitation.....	16.63	126

5 VOCATIONAL AND TECHNICAL SKILLS.....	22.34	126
5.1 Mid-Level Skills.....	1.93	132
5.1.1 Workforce with secondary education.....	1.90	125
5.1.2 Population with secondary education.....	2.65	110
5.1.3 Technicians and associate professionals.....	n/a	n/a
5.1.4 Labour productivity per employee.....	1.25	107
5.2 Employability.....	42.75	83
5.2.1 Ease of finding skilled employees.....	56.04	64
5.2.2 Relevance of education system to the economy.....	29.24	104
5.2.3 Skills matching with secondary education.....	40.30	75
5.2.4 Skills matching with tertiary education.....	45.42	92

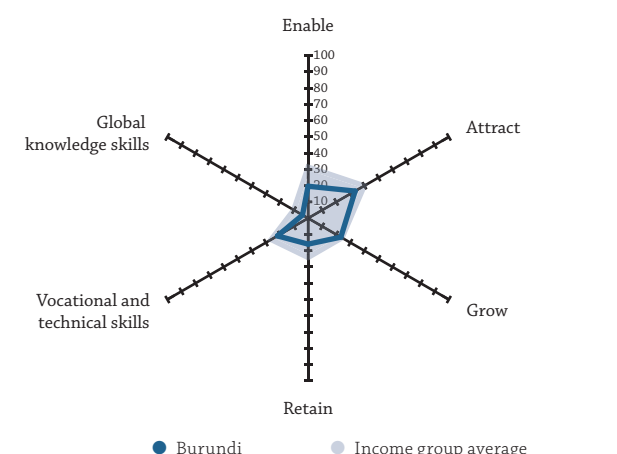
6 GLOBAL KNOWLEDGE SKILLS.....	11.87	110
6.1 High-Level Skills.....	9.17	126
6.1.1 Workforce with tertiary education.....	1.67	122
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	n/a	n/a
6.1.4 Researchers.....	0.45	93
6.1.5 Senior officials and managers.....	n/a	n/a
6.1.6 Availability of scientists and engineers.....	25.39	120
6.2 Talent Impact.....	14.57	90
6.2.1 Innovation output.....	13.84	112
6.2.2 High-value exports.....	15.42	68
6.2.3 New product entrepreneurial activity.....	42.48	51
6.2.4 New business density.....	0.67	95
6.2.5 Scientific journal articles.....	0.43	109

BURUNDI

Key Indicators

Rank (out of 132).....	129
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	11.18

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....19.69 129		
1.1 Regulatory Landscape.....	17.50	129
1.1.1 Government effectiveness.....	14.07	128
1.1.2 Rule of law.....	20.08	129
1.1.3 Political stability.....	21.75	129
1.1.4 Regulatory quality.....	27.57	118
1.1.5 Corruption.....	4.05	131
1.2 Market Landscape.....	16.18	132
1.2.1 Competition intensity.....	35.14	129
1.2.2 Ease of doing business.....	30.01	126
1.2.3 Cluster development.....	23.72	110
1.2.4 R&D expenditure.....	2.34	101
1.2.5 ICT infrastructure.....	5.85	127
1.2.6 Urban population.....	0.00	132
1.3 Business and Labour Landscape.....	25.39	124
Labour Market		
1.3.1 Tertiary-educated unemployment.....	51.05	111
1.3.2 Active labour market policies.....	20.01	110
1.3.3 Labour-employer cooperation.....	28.43	93
Management Practice		
1.3.4 Professional management.....	29.16	113
1.3.5 Relationship of pay to productivity.....	24.03	125
Technology Adoption		
1.3.6 Technology utilisation.....	1.54	131
1.3.7 Investment in emerging technologies.....	23.48	110
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....33.42 125		
2.1 External Openness.....	25.94	120
Attract Business		
2.1.1 FDI and technology transfer.....	30.91	126
2.1.2 Prevalence of foreign ownership.....	28.88	123
Attract People		
2.1.3 Migrant stock.....	38.41	68
2.1.4 International students.....	10.56	61
2.1.5 Brain gain.....	20.92	116
2.2 Internal Openness.....	40.91	119
Social Inclusion		
2.2.1 Tolerance of minorities.....	23.33	100
2.2.2 Tolerance of immigrants.....	60.27	60
2.2.3 Social mobility.....	37.83	123
Gender Equality		
2.2.4 Female graduates.....	0.17	113
2.2.5 Gender development gap.....	89.54	17
2.2.6 Leadership opportunities for women.....	34.31	95

GDP per capita (PPP US\$).....	742.80
GDP (US\$ billions).....	3.08
GTCI score.....	19.67
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....23.27 126		
3.1 Formal Education.....	12.62	100
Enrolment		
3.1.1 Vocational enrolment.....	15.56	67
3.1.2 Tertiary enrolment.....	4.29	117
Quality		
3.1.3 Tertiary education expenditure.....	30.65	34
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	33.77	104
3.2.1 Quality of management schools.....	43.10	82
3.2.2 Prevalence of training in firms.....	37.73	46
3.2.3 Employee development.....	20.49	121
3.3 Access to Growth Opportunities.....	23.43	129
Empowerment		
3.3.1 Delegation of authority.....	33.89	102
3.3.2 Personal rights.....	17.54	125
Collaboration		
3.3.3 Use of virtual social networks.....	17.29	131
3.3.4 Use of virtual professional networks.....	0.09	124
3.3.5 Collaboration within organisations.....	42.77	86
3.3.6 Collaboration across organisations.....	28.98	96

4 RETAIN.....15.93 127		
4.1 Sustainability.....	13.03	130
4.1.1 Pension system.....	5.18	105
4.1.2 Social protection.....	14.81	124
4.1.3 Brain retention.....	19.11	119
4.2 Lifestyle.....	18.83	126
4.2.1 Environmental performance.....	0.00	131
4.2.2 Personal safety.....	9.81	126
4.2.3 Physician density.....	n/a	n/a
4.2.4 Sanitation.....	46.69	106

5 VOCATIONAL AND TECHNICAL SKILLS.....21.74 127		
5.1 Mid-Level Skills.....	3.22	130
5.1.1 Workforce with secondary education.....	2.05	124
5.1.2 Population with secondary education.....	1.46	112
5.1.3 Technicians and associate professionals.....	6.15	116
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	40.27	92
5.2.1 Ease of finding skilled employees.....	42.12	102
5.2.2 Relevance of education system to the economy.....	31.49	98
5.2.3 Skills matching with secondary education.....	33.59	88
5.2.4 Skills matching with tertiary education.....	53.90	71

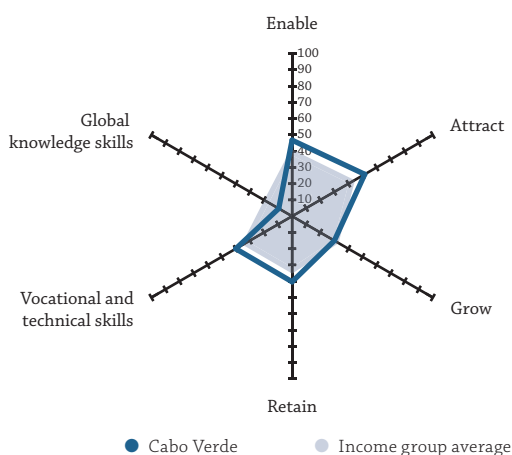
6 GLOBAL KNOWLEDGE SKILLS.....3.98 132		
6.1 High-Level Skills.....	5.12	132
6.1.1 Workforce with tertiary education.....	0.31	126
6.1.2 Population with tertiary education.....	0.43	109
6.1.3 Professionals.....	0.00	127
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	0.00	128
6.1.6 Availability of scientists and engineers.....	24.87	121
6.2 Talent Impact.....	2.84	125
6.2.1 Innovation output.....	4.20	121
6.2.2 High-value exports.....	4.33	103
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.00	132

CABO VERDE

Key Indicators

Rank (out of 132).....	90
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	0.54

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 46.80 73		
1.1 Regulatory Landscape.....	59.73	49
1.1.1 Government effectiveness.....	50.33	62
1.1.2 Rule of law.....	62.31	47
1.1.3 Political stability.....	84.82	22
1.1.4 Regulatory quality.....	43.07	84
1.1.5 Corruption.....	58.11	39
1.2 Market Landscape.....	39.36	98
1.2.1 Competition intensity.....	48.01	120
1.2.2 Ease of doing business.....	45.27	108
1.2.3 Cluster development.....	29.10	98
1.2.4 R&D expenditure.....	1.27	113
1.2.5 ICT infrastructure.....	51.91	72
1.2.6 Urban population.....	60.60	64
1.3 Business and Labour Landscape.....	41.31	82
Labour Market		
1.3.1 Tertiary-educated unemployment.....	79.65	67
1.3.2 Active labour market policies.....	29.84	95
1.3.3 Labour-employer cooperation.....	32.55	87
Management Practice		
1.3.4 Professional management.....	33.19	102
1.3.5 Relationship of pay to productivity.....	36.50	100
Technology Adoption		
1.3.6 Technology utilisation.....	43.37	89
1.3.7 Investment in emerging technologies.....	34.06	83
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT..... 51.61 56		
2.1 External Openness.....	37.89	84
Attract Business		
2.1.1 FDI and technology transfer.....	53.26	78
2.1.2 Prevalence of foreign ownership.....	54.22	78
Attract People		
2.1.3 Migrant stock.....	37.59	70
2.1.4 International students.....	2.91	86
2.1.5 Brain gain.....	41.48	76
2.2 Internal Openness.....	65.33	38
Social Inclusion		
2.2.1 Tolerance of minorities.....	72.22	25
2.2.2 Tolerance of immigrants.....	n/a	n/a
2.2.3 Social mobility.....	51.85	79
Gender Equality		
2.2.4 Female graduates.....	87.67	18
2.2.5 Gender development gap.....	70.74	85
2.2.6 Leadership opportunities for women.....	44.18	69

GDP per capita (PPP US\$).....	7,494.71
GDP (US\$ billions).....	1.99
GTCI score.....	36.38
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW..... 30.03 99		
3.1 Formal Education.....	10.14	109
Enrolment		
3.1.1 Vocational enrolment.....	3.99	100
3.1.2 Tertiary enrolment.....	16.66	89
Quality		
3.1.3 Tertiary education expenditure.....	19.91	64
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	29.62	116
3.2.1 Quality of management schools.....	45.45	73
3.2.2 Prevalence of training in firms.....	17.41	87
3.2.3 Employee development.....	25.99	107
3.3 Access to Growth Opportunities.....	50.34	52
Empowerment		
3.3.1 Delegation of authority.....	33.08	103
3.3.2 Personal rights.....	88.92	38
Collaboration		
3.3.3 Use of virtual social networks.....	60.64	98
3.3.4 Use of virtual professional networks.....	n/a	n/a
3.3.5 Collaboration within organisations.....	33.86	106
3.3.6 Collaboration across organisations.....	35.18	78

4 RETAIN..... 40.34 88		
4.1 Sustainability.....	35.13	83
4.1.1 Pension system.....	24.39	76
4.1.2 Social protection.....	39.51	74
4.1.3 Brain retention.....	41.48	64
4.2 Lifestyle.....	45.55	89
4.2.1 Environmental performance.....	49.19	77
4.2.2 Personal safety.....	58.11	60
4.2.3 Physician density.....	12.33	91
4.2.4 Sanitation.....	62.56	97

5 VOCATIONAL AND TECHNICAL SKILLS..... 40.02 77		
5.1 Mid-Level Skills.....	32.47	78
5.1.1 Workforce with secondary education.....	62.08	33
5.1.2 Population with secondary education.....	13.33	103
5.1.3 Technicians and associate professionals.....	21.99	88
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	47.56	70
5.2.1 Ease of finding skilled employees.....	54.68	67
5.2.2 Relevance of education system to the economy.....	49.89	57
5.2.3 Skills matching with secondary education.....	41.79	71
5.2.4 Skills matching with tertiary education.....	43.89	94

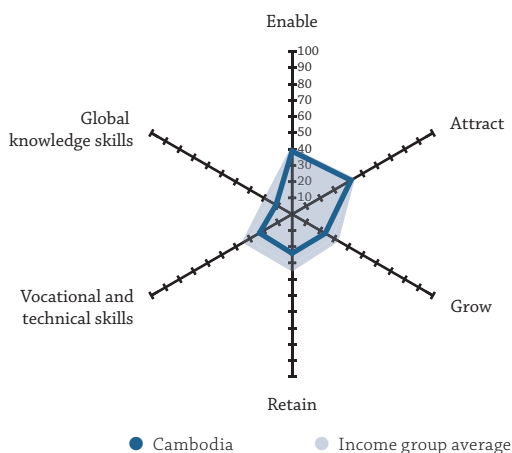
6 GLOBAL KNOWLEDGE SKILLS..... 9.49 120		
6.1 High-Level Skills.....	18.70	96
6.1.1 Workforce with tertiary education.....	21.75	82
6.1.2 Population with tertiary education.....	14.27	80
6.1.3 Professionals.....	23.65	72
6.1.4 Researchers.....	0.47	91
6.1.5 Senior officials and managers.....	17.98	73
6.1.6 Availability of scientists and engineers.....	34.08	108
6.2 Talent Impact.....	0.28	130
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	0.00	127
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.56	104

CAMBODIA

Key Indicators

Rank (out of 132).....	117
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	16.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	38.80	97
1.1 Regulatory Landscape.....	34.24	109
1.1.1 Government effectiveness.....	30.66	111
1.1.2 Rule of law.....	28.00	123
1.1.3 Political stability.....	68.70	57
1.1.4 Regulatory quality.....	35.74	105
1.1.5 Corruption.....	8.11	127
1.2 Market Landscape.....	32.63	114
1.2.1 Competition intensity.....	53.83	108
1.2.2 Ease of doing business.....	43.21	112
1.2.3 Cluster development.....	53.03	43
1.2.4 R&D expenditure.....	2.27	104
1.2.5 ICT infrastructure.....	31.55	100
1.2.6 Urban population.....	11.91	126
1.3 Business and Labour Landscape.....	49.51	57
Labour Market		
1.3.1 Tertiary-educated unemployment.....	97.12	3
1.3.2 Active labour market policies.....	31.55	87
1.3.3 Labour-employer cooperation.....	40.84	57
Management Practice		
1.3.4 Professional management.....	37.59	96
1.3.5 Relationship of pay to productivity.....	54.55	53
Technology Adoption		
1.3.6 Technology utilisation.....	41.07	94
1.3.7 Investment in emerging technologies.....	43.85	53
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	41.78	100
2.1 External Openness.....	44.50	61
Attract Business		
2.1.1 FDI and technology transfer.....	62.79	53
2.1.2 Prevalence of foreign ownership.....	52.74	85
Attract People		
2.1.3 Migrant stock.....	11.66	114
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	50.81	45
2.2 Internal Openness.....	39.07	124
Social Inclusion		
2.2.1 Tolerance of minorities.....	41.11	76
2.2.2 Tolerance of immigrants.....	4.11	128
2.2.3 Social mobility.....	46.58	99
Gender Equality		
2.2.4 Female graduates.....	36.71	101
2.2.5 Gender development gap.....	58.42	106
2.2.6 Leadership opportunities for women.....	47.49	62

GDP per capita (PPP US\$).....	4,354.07
GDP (US\$ billions).....	24.57
GTCI score.....	27.12
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	23.55	124
3.1 Formal Education.....	3.33	128
Enrolment		
3.1.1 Vocational enrolment.....	3.46	103
3.1.2 Tertiary enrolment.....	9.84	100
Quality		
3.1.3 Tertiary education expenditure.....	0.00	117
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	29.77	114
3.2.1 Quality of management schools.....	28.06	118
3.2.2 Prevalence of training in firms.....	24.80	73
3.2.3 Employee development.....	36.44	69
3.3 Access to Growth Opportunities.....	37.56	107
Empowerment		
3.3.1 Delegation of authority.....	34.85	97
3.3.2 Personal rights.....	29.81	116
Collaboration		
3.3.3 Use of virtual social networks.....	70.48	79
3.3.4 Use of virtual professional networks.....	1.17	109
3.3.5 Collaboration within organisations.....	49.58	58
3.3.6 Collaboration across organisations.....	39.46	67

4 RETAIN.....	24.04	116
4.1 Sustainability.....	21.82	114
4.1.1 Pension system.....	0.00	119
4.1.2 Social protection.....	21.71	115
4.1.3 Brain retention.....	43.76	57
4.2 Lifestyle.....	26.27	113
4.2.1 Environmental performance.....	26.34	115
4.2.2 Personal safety.....	31.81	105
4.2.3 Physician density.....	1.99	110
4.2.4 Sanitation.....	44.93	107

5 VOCATIONAL AND TECHNICAL SKILLS.....	23.14	125
5.1 Mid-Level Skills.....	9.10	120
5.1.1 Workforce with secondary education.....	9.13	117
5.1.2 Population with secondary education.....	21.02	96
5.1.3 Technicians and associate professionals.....	3.28	125
5.1.4 Labour productivity per employee.....	2.96	101
5.2 Employability.....	37.18	100
5.2.1 Ease of finding skilled employees.....	35.15	115
5.2.2 Relevance of education system to the economy.....	44.81	64
5.2.3 Skills matching with secondary education.....	20.69	123
5.2.4 Skills matching with tertiary education.....	48.10	82

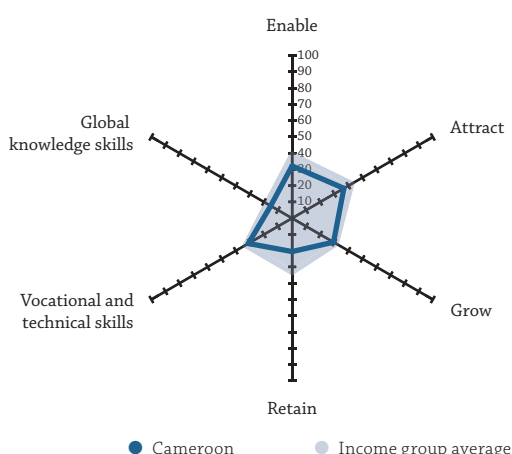
6 GLOBAL KNOWLEDGE SKILLS.....	11.42	112
6.1 High-Level Skills.....	14.57	114
6.1.1 Workforce with tertiary education.....	8.16	110
6.1.2 Population with tertiary education.....	38.93	38
6.1.3 Professionals.....	8.13	114
6.1.4 Researchers.....	0.24	103
6.1.5 Senior officials and managers.....	3.73	117
6.1.6 Availability of scientists and engineers.....	28.26	117
6.2 Talent Impact.....	8.27	110
6.2.1 Innovation output.....	23.29	81
6.2.2 High-value exports.....	1.28	119
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.25	118

CAMEROON

Key Indicators

Rank (out of 132).....	116
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	25.22

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	32.17	119
1.1 Regulatory Landscape.....	27.88	124
1.1.1 Government effectiveness.....	26.67	118
1.1.2 Rule of law.....	28.76	121
1.1.3 Political stability.....	41.20	118
1.1.4 Regulatory quality.....	27.89	117
1.1.5 Corruption.....	14.86	120
1.2 Market Landscape.....	35.82	106
1.2.1 Competition intensity.....	59.81	88
1.2.2 Ease of doing business.....	30.67	125
1.2.3 Cluster development.....	24.05	108
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	14.76	117
1.2.6 Urban population.....	49.84	83
1.3 Business and Labour Landscape.....	32.82	112
Labour Market		
1.3.1 Tertiary-educated unemployment.....	56.12	106
1.3.2 Active labour market policies.....	23.97	105
1.3.3 Labour-employer cooperation.....	24.40	102
Management Practice		
1.3.4 Professional management.....	29.91	111
1.3.5 Relationship of pay to productivity.....	30.29	119
Technology Adoption		
1.3.6 Technology utilisation.....	31.79	112
1.3.7 Investment in emerging technologies.....	33.24	87
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	36.79	113
2.1 External Openness.....	32.20	103
Attract Business		
2.1.1 FDI and technology transfer.....	38.05	113
2.1.2 Prevalence of foreign ownership.....	57.17	69
Attract People		
2.1.3 Migrant stock.....	32.31	77
2.1.4 International students.....	4.06	81
2.1.5 Brain gain.....	29.40	103
2.2 Internal Openness.....	41.38	118
Social Inclusion		
2.2.1 Tolerance of minorities.....	16.67	111
2.2.2 Tolerance of immigrants.....	67.12	46
2.2.3 Social mobility.....	47.78	95
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	41.12	119
2.2.6 Leadership opportunities for women.....	34.19	96

GDP per capita (PPP US\$).....	3,771.05
GDP (US\$ billions).....	38.50
GTCI score.....	27.53
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	29.46	102
3.1 Formal Education.....	13.03	99
Enrolment		
3.1.1 Vocational enrolment.....	33.41	33
3.1.2 Tertiary enrolment.....	14.65	94
Quality		
3.1.3 Tertiary education expenditure.....	4.07	112
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	42.07	70
3.2.1 Quality of management schools.....	52.29	54
3.2.2 Prevalence of training in firms.....	45.12	35
3.2.3 Employee development.....	28.79	98
3.3 Access to Growth Opportunities.....	33.29	114
Empowerment		
3.3.1 Delegation of authority.....	26.50	115
3.3.2 Personal rights.....	45.46	105
Collaboration		
3.3.3 Use of virtual social networks.....	52.28	113
3.3.4 Use of virtual professional networks.....	2.08	102
3.3.5 Collaboration within organisations.....	46.40	69
3.3.6 Collaboration across organisations.....	27.03	102

4 RETAIN.....	20.50	124
4.1 Sustainability.....	18.91	122
4.1.1 Pension system.....	8.74	98
4.1.2 Social protection.....	23.31	112
4.1.3 Brain retention.....	24.68	105
4.2 Lifestyle.....	22.08	121
4.2.1 Environmental performance.....	22.30	121
4.2.2 Personal safety.....	30.83	109
4.2.3 Physician density.....	1.03	118
4.2.4 Sanitation.....	34.18	116

5 VOCATIONAL AND TECHNICAL SKILLS.....	31.07	103
5.1 Mid-Level Skills.....	13.97	115
5.1.1 Workforce with secondary education.....	19.10	106
5.1.2 Population with secondary education.....	22.59	95
5.1.3 Technicians and associate professionals.....	11.76	109
5.1.4 Labour productivity per employee.....	2.43	105
5.2 Employability.....	48.16	67
5.2.1 Ease of finding skilled employees.....	62.31	51
5.2.2 Relevance of education system to the economy.....	39.67	80
5.2.3 Skills matching with secondary education.....	43.01	63
5.2.4 Skills matching with tertiary education.....	47.66	84

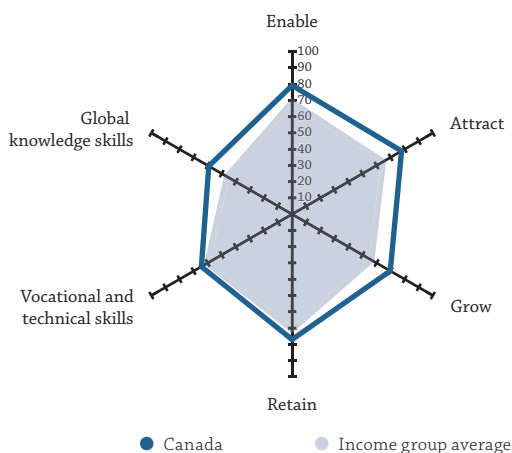
6 GLOBAL KNOWLEDGE SKILLS.....	15.21	100
6.1 High-Level Skills.....	15.55	110
6.1.1 Workforce with tertiary education.....	8.64	108
6.1.2 Population with tertiary education.....	0.58	108
6.1.3 Professionals.....	12.44	106
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	16.73	76
6.1.6 Availability of scientists and engineers.....	39.37	91
6.2 Talent Impact.....	14.88	88
6.2.1 Innovation output.....	16.99	103
6.2.2 High-value exports.....	13.89	75
6.2.3 New product entrepreneurial activity.....	27.56	69
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	1.07	94

CANADA

Key Indicators

Rank (out of 132).....	13
Income group	High income
Regional group	Northern America
Population (millions)	37.06

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....79.25	14	
1.1 Regulatory Landscape.....	92.11	8
1.1.1 Government effectiveness.....	91.49	5
1.1.2 Rule of law.....	94.73	10
1.1.3 Political stability.....	89.39	11
1.1.4 Regulatory quality.....	94.39	5
1.1.5 Corruption.....	90.54	9
1.2 Market Landscape.....	71.34	21
1.2.1 Competition intensity.....	78.67	30
1.2.2 Ease of doing business.....	86.91	20
1.2.3 Cluster development.....	69.87	21
1.2.4 R&D expenditure.....	34.43	22
1.2.5 ICT infrastructure.....	79.52	26
1.2.6 Urban population.....	78.63	30
1.3 Business and Labour Landscape.....	74.32	12
Labour Market		
1.3.1 Tertiary-educated unemployment.....	84.84	49
1.3.2 Active labour market policies.....	75.33	21
1.3.3 Labour-employer cooperation.....	67.52	17
Management Practice		
1.3.4 Professional management.....	92.40	10
1.3.5 Relationship of pay to productivity.....	78.61	7
Technology Adoption		
1.3.6 Technology utilisation.....	76.74	22
1.3.7 Investment in emerging technologies.....	68.25	19
1.3.8 Robot density.....	50.86	13
2 ATTRACT.....77.78	8	
2.1 External Openness.....	70.90	12
Attract Business		
2.1.1 FDI and technology transfer.....	74.71	26
2.1.2 Prevalence of foreign ownership.....	81.11	18
Attract People		
2.1.3 Migrant stock.....	72.31	16
2.1.4 International students.....	43.62	14
2.1.5 Brain gain.....	82.74	7
2.2 Internal Openness.....	84.66	5
Social Inclusion		
2.2.1 Tolerance of minorities.....	80.00	11
2.2.2 Tolerance of immigrants.....	100.00	1
2.2.3 Social mobility.....	92.23	7
Gender Equality		
2.2.4 Female graduates.....	74.24	58
2.2.5 Gender development gap.....	83.76	38
2.2.6 Leadership opportunities for women.....	77.74	15

GDP per capita (PPP US\$)	47,870.73
GDP (US\$ billions)	1,709.33
GTCI score.....	71.26
GTCI score (income group average)	61.46

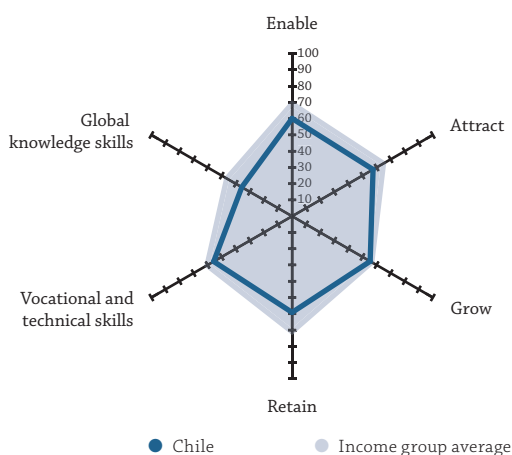
	Score	Rank
3 GROW.....69.76	11	
3.1 Formal Education.....	53.11	14
Enrolment		
3.1.1 Vocational enrolment.....	7.27	90
3.1.2 Tertiary enrolment.....	52.76	32
Quality		
3.1.3 Tertiary education expenditure.....	38.84	14
3.1.4 Reading, maths, and science.....	86.70	4
3.1.5 University ranking.....	79.99	6
3.2 Lifelong Learning.....	77.88	10
3.2.1 Quality of management schools.....	85.39	6
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	70.38	18
3.3 Access to Growth Opportunities.....	78.28	9
Empowerment		
3.3.1 Delegation of authority.....	85.67	10
3.3.2 Personal rights.....	96.69	13
Collaboration		
3.3.3 Use of virtual social networks.....	92.96	8
3.3.4 Use of virtual professional networks.....	60.59	7
3.3.5 Collaboration within organisations.....	76.73	20
3.3.6 Collaboration across organisations.....	57.06	30
4 RETAIN.....77.11	20	
4.1 Sustainability.....	78.05	17
4.1.1 Pension system.....	71.07	36
4.1.2 Social protection.....	85.80	13
4.1.3 Brain retention.....	77.29	15
4.2 Lifestyle.....	76.17	25
4.2.1 Environmental performance.....	74.60	24
4.2.2 Personal safety.....	91.28	7
4.2.3 Physician density.....	40.41	48
4.2.4 Sanitation.....	98.39	36
5 VOCATIONAL AND TECHNICAL SKILLS.....64.44	19	
5.1 Mid-Level Skills.....	52.82	42
5.1.1 Workforce with secondary education.....	33.44	83
5.1.2 Population with secondary education.....	48.89	47
5.1.3 Technicians and associate professionals.....	73.53	14
5.1.4 Labour productivity per employee.....	55.42	21
5.2 Employability.....	76.06	15
5.2.1 Ease of finding skilled employees.....	79.15	14
5.2.2 Relevance of education system to the economy.....	78.62	10
5.2.3 Skills matching with secondary education.....	67.41	21
5.2.4 Skills matching with tertiary education.....	79.08	17
6 GLOBAL KNOWLEDGE SKILLS.....59.20	14	
6.1 High-Level Skills.....	68.85	4
6.1.1 Workforce with tertiary education.....	100.00	1
6.1.2 Population with tertiary education.....	76.56	3
6.1.3 Professionals.....	48.95	27
6.1.4 Researchers.....	51.75	21
6.1.5 Senior officials and managers.....	49.98	23
6.1.6 Availability of scientists and engineers.....	85.84	5
6.2 Talent Impact.....	49.55	20
6.2.1 Innovation output.....	61.30	21
6.2.2 High-value exports.....	38.27	27
6.2.3 New product entrepreneurial activity.....	84.99	5
6.2.4 New business density.....	0.26	103
6.2.5 Scientific journal articles.....	62.94	12

CHILE

Key Indicators

Rank (out of 132).....	34
Income group.....	High income
Regional group.....	Latin America and the Caribbean
Population (millions).....	18.73

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	60.16	38
1.1 Regulatory Landscape.....	73.85	26
1.1.1 Government effectiveness.....	67.18	35
1.1.2 Rule of law.....	76.29	28
1.1.3 Political stability.....	73.32	45
1.1.4 Regulatory quality.....	80.86	20
1.1.5 Corruption.....	71.62	25
1.2 Market Landscape.....	58.29	44
1.2.1 Competition intensity.....	78.70	29
1.2.2 Ease of doing business.....	73.60	52
1.2.3 Cluster development.....	39.10	77
1.2.4 R&D expenditure.....	7.63	73
1.2.5 ICT infrastructure.....	65.01	57
1.2.6 Urban population.....	85.70	17
1.3 Business and Labour Landscape.....	48.35	59
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	76.90	74
1.3.2 Active labour market policies.....	33.80	79
1.3.3 Labour-employer cooperation.....	39.22	62
1.3.4 Management Practice		
1.3.4.1 Professional management.....	68.38	28
1.3.5 Relationship of pay to productivity.....	62.41	42
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	66.95	37
1.3.7 Investment in emerging technologies.....	38.42	66
1.3.8 Robot density.....	0.70	56
2 ATTRACT.....	57.53	39
2.1 External Openness.....	50.15	41
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	78.89	18
2.1.2 Prevalence of foreign ownership.....	81.24	17
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	29.00	84
2.1.4 International students.....	1.26	98
2.1.5 Brain gain.....	60.38	29
2.2 Internal Openness.....	64.90	41
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	77.78	15
2.2.2 Tolerance of immigrants.....	72.60	36
2.2.3 Social mobility.....	64.90	40
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	72.76	63
2.2.5 Gender development gap.....	75.18	76
2.2.6 Leadership opportunities for women.....	26.16	111

GDP per capita (PPP US\$).....	25,283.93
GDP (US\$ billions).....	298.23
GTCI score.....	53.96
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	55.47	26
3.1 Formal Education.....	44.82	29
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	29.74	39
3.1.2 Tertiary enrolment.....	72.21	5
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	31.85	28
3.1.4 Reading, maths, and science.....	48.78	41
3.1.5 University ranking.....	41.51	31
3.2 Lifelong Learning.....	63.41	27
3.2.1 Quality of management schools.....	69.70	26
3.2.2 Prevalence of training in firms.....	71.37	9
3.2.3 Employee development.....	49.15	47
3.3 Access to Growth Opportunities.....	58.19	32
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	55.00	40
3.3.2 Personal rights.....	90.85	35
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	84.96	34
3.3.4 Use of virtual professional networks.....	38.13	16
3.3.5 Collaboration within organisations.....	40.99	92
3.3.6 Collaboration across organisations.....	39.20	69

4 RETAIN.....	59.18	40
4.1 Sustainability.....	61.67	34
4.1.1 Pension system.....	60.00	48
4.1.2 Social protection.....	48.71	50
4.1.3 Brain retention.....	76.28	16
4.2 Lifestyle.....	56.70	59
4.2.1 Environmental performance.....	50.11	72
4.2.2 Personal safety.....	60.53	54
4.2.3 Physician density.....	16.26	82
4.2.4 Sanitation.....	99.88	16

5 VOCATIONAL AND TECHNICAL SKILLS.....	55.68	36
5.1 Mid-Level Skills.....	51.44	46
5.1.1 Workforce with secondary education.....	70.39	24
5.1.2 Population with secondary education.....	51.83	40
5.1.3 Technicians and associate professionals.....	50.30	42
5.1.4 Labour productivity per employee.....	33.25	52
5.2 Employability.....	59.92	39
5.2.1 Ease of finding skilled employees.....	74.92	21
5.2.2 Relevance of education system to the economy.....	41.63	72
5.2.3 Skills matching with secondary education.....	46.81	53
5.2.4 Skills matching with tertiary education.....	76.31	25

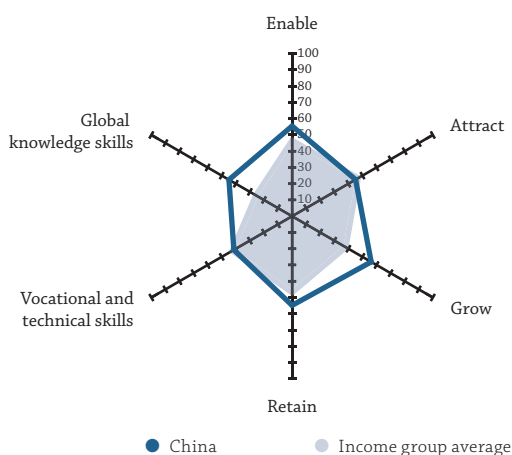
6 GLOBAL KNOWLEDGE SKILLS.....	35.75	40
6.1 High-Level Skills.....	29.99	64
6.1.1 Workforce with tertiary education.....	26.96	71
6.1.2 Population with tertiary education.....	30.76	53
6.1.3 Professionals.....	32.29	53
6.1.4 Researchers.....	5.97	67
6.1.5 Senior officials and managers.....	12.52	85
6.1.6 Availability of scientists and engineers.....	71.42	21
6.2 Talent Impact.....	41.52	30
6.2.1 Innovation output.....	32.57	61
6.2.2 High-value exports.....	18.24	63
6.2.3 New product entrepreneurial activity.....	99.19	2
6.2.4 New business density.....	42.96	14
6.2.5 Scientific journal articles.....	14.65	48

CHINA

Key Indicators

Rank (out of 132).....	42
Income group.....	Upper-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	1,392.73

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....55.47	45	
1.1 Regulatory Landscape.....	48.21	70
1.1.1 Government effectiveness.....	56.77	47
1.1.2 Rule of law.....	46.52	78
1.1.3 Political stability.....	59.50	79
1.1.4 Regulatory quality.....	44.46	80
1.1.5 Corruption.....	33.78	71
1.2 Market Landscape.....	61.71	35
1.2.1 Competition intensity.....	78.51	31
1.2.2 Ease of doing business.....	76.87	42
1.2.3 Cluster development.....	65.86	27
1.2.4 R&D expenditure.....	46.34	15
1.2.5 ICT infrastructure.....	49.62	73
1.2.6 Urban population.....	53.03	75
1.3 Business and Labour Landscape.....	56.49	41
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	70.12	27
1.3.3 Labour-employer cooperation.....	46.17	51
1.3.4 Management Practice		
1.3.4 Professional management.....	57.11	44
1.3.5 Relationship of pay to productivity.....	68.62	26
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	54.03	56
1.3.7 Investment in emerging technologies.....	59.71	32
1.3.8 Robot density.....	39.65	20
2 ATTRACT.....45.10	87	
2.1 External Openness.....	37.95	83
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	64.42	51
2.1.2 Prevalence of foreign ownership.....	57.62	67
2.1.3 Attract People		
2.1.3 Migrant stock.....	0.00	132
2.1.4 International students.....	1.21	99
2.1.5 Brain gain.....	66.50	24
2.2 Internal Openness.....	52.25	89
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	30.00	91
2.2.2 Tolerance of immigrants.....	35.62	102
2.2.3 Social mobility.....	62.10	48
2.2.4 Gender Equality		
2.2.4 Female graduates.....	61.09	80
2.2.5 Gender development gap.....	72.88	81
2.2.6 Leadership opportunities for women.....	51.79	55

GDP per capita (PPP US\$).....	18,210.09
GDP (US\$ billions).....	13,608.15
GTCI score.....	49.64
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....56.20	22	
3.1 Formal Education.....	59.27	8
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	29.62	40
3.1.2 Tertiary enrolment.....	39.99	54
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	82.46	7
3.1.5 University ranking.....	85.02	3
3.2 Lifelong Learning.....	70.74	22
3.2.1 Quality of management schools.....	54.44	47
3.2.2 Prevalence of training in firms.....	100.00	1
3.2.3 Employee development.....	57.78	32
3.3 Access to Growth Opportunities.....	38.60	105
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	52.72	47
3.3.2 Personal rights.....	6.95	128
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	44.12	121
3.3.4 Use of virtual professional networks.....	0.41	121
3.3.5 Collaboration within organisations.....	61.09	32
3.3.6 Collaboration across organisations.....	66.29	15

4 RETAIN.....54.84	52	
4.1 Sustainability.....	63.96	30
4.1.1 Pension system.....	69.80	39
4.1.2 Social protection.....	59.37	39
4.1.3 Brain retention.....	62.71	32
4.2 Lifestyle.....	45.72	88
4.2.1 Environmental performance.....	38.86	97
4.2.2 Personal safety.....	42.16	91
4.2.3 Physician density.....	28.75	65
4.2.4 Sanitation.....	73.14	91

5 VOCATIONAL AND TECHNICAL SKILLS.....41.37	73	
5.1 Mid-Level Skills.....	18.84	105
5.1.1 Workforce with secondary education.....	n/a	n/a
5.1.2 Population with secondary education.....	17.98	99
5.1.3 Technicians and associate professionals.....	n/a	n/a
5.1.4 Labour productivity per employee.....	19.71	68
5.2 Employability.....	63.90	32
5.2.1 Ease of finding skilled employees.....	68.12	40
5.2.2 Relevance of education system to the economy.....	63.76	27
5.2.3 Skills matching with secondary education.....	63.58	27
5.2.4 Skills matching with tertiary education.....	60.14	54

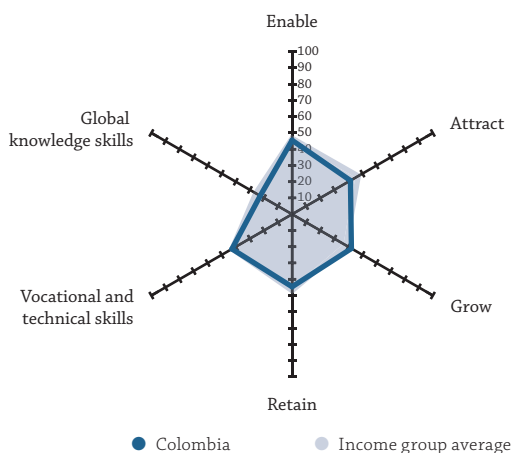
6 GLOBAL KNOWLEDGE SKILLS.....44.86	29	
6.1 High-Level Skills.....	32.04	60
6.1.1 Workforce with tertiary education.....	n/a	n/a
6.1.2 Population with tertiary education.....	12.69	86
6.1.3 Professionals.....	n/a	n/a
6.1.4 Researchers.....	14.86	45
6.1.5 Senior officials and managers.....	n/a	n/a
6.1.6 Availability of scientists and engineers.....	68.58	27
6.2 Talent Impact.....	57.69	15
6.2.1 Innovation output.....	81.26	5
6.2.2 High-value exports.....	70.91	7
6.2.3 New product entrepreneurial activity.....	66.36	14
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	12.22	50

COLOMBIA

Key Indicators

Rank (out of 132).....	74
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	49.65

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....45.51	81	
1.1 Regulatory Landscape.....	44.62	81
1.1.1 Government effectiveness.....	44.91	75
1.1.2 Rule of law.....	44.26	86
1.1.3 Political stability.....	47.76	108
1.1.4 Regulatory quality.....	56.45	54
1.1.5 Corruption.....	29.73	81
1.2 Market Landscape.....	54.31	55
1.2.1 Competition intensity.....	79.54	26
1.2.2 Ease of doing business.....	69.01	60
1.2.3 Cluster development.....	40.95	73
1.2.4 R&D expenditure.....	5.03	85
1.2.5 ICT infrastructure.....	53.44	70
1.2.6 Urban population.....	77.90	32
1.3 Business and Labour Landscape.....	37.58	96
Labour Market		
1.3.1 Tertiary-educated unemployment.....	63.02	97
1.3.2 Active labour market policies.....	30.66	89
1.3.3 Labour-employer cooperation.....	38.35	66
Management Practice		
1.3.4 Professional management.....	45.57	77
1.3.5 Relationship of pay to productivity.....	38.29	94
Technology Adoption		
1.3.6 Technology utilisation.....	45.74	79
1.3.7 Investment in emerging technologies.....	38.85	64
1.3.8 Robot density.....	0.19	60
2 ATTRACT.....41.45	102	
2.1 External Openness.....	30.19	109
Attract Business		
2.1.1 FDI and technology transfer.....	56.46	67
2.1.2 Prevalence of foreign ownership.....	51.00	89
Attract People		
2.1.3 Migrant stock.....	4.15	126
2.1.4 International students.....	0.58	105
2.1.5 Brain gain.....	38.74	85
2.2 Internal Openness.....	52.71	88
Social Inclusion		
2.2.1 Tolerance of minorities.....	32.22	88
2.2.2 Tolerance of immigrants.....	57.53	69
2.2.3 Social mobility.....	39.86	119
Gender Equality		
2.2.4 Female graduates.....	70.01	70
2.2.5 Gender development gap.....	87.81	20
2.2.6 Leadership opportunities for women.....	28.83	105

GDP per capita (PPP US\$).....	14,999.44
GDP (US\$ billions).....	330.23
GTCI score.....	39.85
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....42.15	53	
3.1 Formal Education.....	28.95	59
Enrolment		
3.1.1 Vocational enrolment.....	11.55	81
3.1.2 Tertiary enrolment.....	47.49	43
Quality		
3.1.3 Tertiary education expenditure.....	17.75	73
3.1.4 Reading, maths, and science.....	33.43	57
3.1.5 University ranking.....	34.55	33
3.2 Lifelong Learning.....	52.78	42
3.2.1 Quality of management schools.....	47.72	64
3.2.2 Prevalence of training in firms.....	78.63	5
3.2.3 Employee development.....	31.98	86
3.3 Access to Growth Opportunities.....	44.72	80
Empowerment		
3.3.1 Delegation of authority.....	47.64	64
3.3.2 Personal rights.....	57.76	91
Collaboration		
3.3.3 Use of virtual social networks.....	63.95	95
3.3.4 Use of virtual professional networks.....	20.74	31
3.3.5 Collaboration within organisations.....	39.81	95
3.3.6 Collaboration across organisations.....	38.40	73

4 RETAIN.....44.63	75	
4.1 Sustainability.....	38.14	73
4.1.1 Pension system.....	30.83	69
4.1.2 Social protection.....	42.74	67
4.1.3 Brain retention.....	40.85	66
4.2 Lifestyle.....	51.12	76
4.2.1 Environmental performance.....	62.99	38
4.2.2 Personal safety.....	29.32	111
4.2.3 Physician density.....	28.90	63
4.2.4 Sanitation.....	83.25	81

5 VOCATIONAL AND TECHNICAL SKILLS.....42.72	69	
5.1 Mid-Level Skills.....	33.63	75
5.1.1 Workforce with secondary education.....	40.83	74
5.1.2 Population with secondary education.....	37.48	65
5.1.3 Technicians and associate professionals.....	37.93	58
5.1.4 Labour productivity per employee.....	18.29	72
5.2 Employability.....	51.80	57
5.2.1 Ease of finding skilled employees.....	59.64	55
5.2.2 Relevance of education system to the economy.....	39.05	83
5.2.3 Skills matching with secondary education.....	46.62	55
5.2.4 Skills matching with tertiary education.....	61.90	45

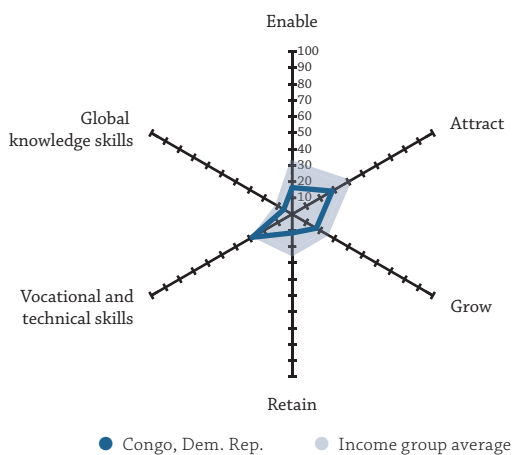
6 GLOBAL KNOWLEDGE SKILLS.....22.66	77	
6.1 High-Level Skills.....	26.29	74
6.1.1 Workforce with tertiary education.....	42.83	43
6.1.2 Population with tertiary education.....	31.30	52
6.1.3 Professionals.....	4.85	120
6.1.4 Researchers.....	0.95	89
6.1.5 Senior officials and managers.....	34.61	40
6.1.6 Availability of scientists and engineers.....	43.21	79
6.2 Talent Impact.....	19.03	75
6.2.1 Innovation output.....	25.39	75
6.2.2 High-value exports.....	25.87	48
6.2.3 New product entrepreneurial activity.....	27.94	67
6.2.4 New business density.....	10.94	44
6.2.5 Scientific journal articles.....	5.00	68

CONGO, DEM. REP.

Key Indicators

Rank (out of 132).....	130
Income group	Low income
Regional group	Sub-Saharan Africa
Population (millions)	84.07

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE	16.40	131
1.1 Regulatory Landscape.....	10.97	131
1.1.1 Government effectiveness	6.93	131
1.1.2 Rule of law	13.20	130
1.1.3 Political stability.....	14.48	130
1.1.4 Regulatory quality.....	12.11	130
1.1.5 Corruption	8.11	127
1.2 Market Landscape.....	18.53	131
1.2.1 Competition intensity.....	40.05	127
1.2.2 Ease of doing business.....	11.15	130
1.2.3 Cluster development.....	15.24	125
1.2.4 R&D expenditure.....	8.59	70
1.2.5 ICT infrastructure.....	0.00	128
1.2.6 Urban population.....	36.14	102
1.3 Business and Labour Landscape.....	19.69	130
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment	60.68	100
1.3.2 Active labour market policies	7.40	125
1.3.3 Labour-employer cooperation	8.69	126
1.3.4 Management Practice		
1.3.4 Professional management	23.03	126
1.3.5 Relationship of pay to productivity.....	7.15	130
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	13.38	127
1.3.7 Investment in emerging technologies	17.50	122
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	28.47	130
2.1 External Openness	29.06	114
2.1.1 Attract Business		
2.1.1 FDI and technology transfer	34.92	120
2.1.2 Prevalence of foreign ownership.....	57.55	68
2.1.3 Attract People		
2.1.3 Migrant stock	21.71	98
2.1.4 International students.....	1.51	93
2.1.5 Brain gain	29.60	102
2.2 Internal Openness	27.89	130
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	0.00	130
2.2.2 Tolerance of immigrants	53.42	79
2.2.3 Social mobility	41.07	117
2.2.4 Gender Equality		
2.2.4 Female graduates	17.33	109
2.2.5 Gender development gap	36.11	123
2.2.6 Leadership opportunities for women	19.42	119

GDP per capita (PPP US\$)	930.53
GDP (US\$ billions)	47.23
GTCI score.....	17.98
GTCI score (income group average)	26.01

	Score	Rank
3 GROW.....	17.23	130
3.1 Formal Education.....	10.97	104
3.1.1 Enrolment		
3.1.1 Vocational enrolment	29.12	42
3.1.2 Tertiary enrolment	4.64	116
3.1.3 Quality		
3.1.3 Tertiary education expenditure	10.11	95
3.1.4 Reading, maths, and science	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	17.39	128
3.2.1 Quality of management schools	24.06	122
3.2.2 Prevalence of training in firms.....	17.94	86
3.2.3 Employee development	10.17	129
3.3 Access to Growth Opportunities	23.33	130
3.3.1 Empowerment		
3.3.1 Delegation of authority	18.28	126
3.3.2 Personal rights	20.87	124
3.3.3 Collaboration		
3.3.3 Use of virtual social networks	34.68	127
3.3.4 Use of virtual professional networks	0.02	125
3.3.5 Collaboration within organisations.....	38.68	97
3.3.6 Collaboration across organisations.....	27.44	101

4 RETAIN.....	11.51	132
4.1 Sustainability	17.81	123
4.1.1 Pension system	14.00	88
4.1.2 Social protection.....	16.34	123
4.1.3 Brain retention	23.10	109
4.2 Lifestyle	5.21	132
4.2.1 Environmental performance	4.97	129
4.2.2 Personal safety	1.12	129
4.2.3 Physician density.....	1.15	115
4.2.4 Sanitation	13.60	127

5 VOCATIONAL AND TECHNICAL SKILLS.....	28.36	110
5.1 Mid-Level Skills	24.80	94
5.1.1 Workforce with secondary education	50.86	58
5.1.2 Population with secondary education	24.63	85
5.1.3 Technicians and associate professionals.....	23.61	86
5.1.4 Labour productivity per employee.....	0.10	111
5.2 Employability.....	31.92	118
5.2.1 Ease of finding skilled employees	48.13	88
5.2.2 Relevance of education system to the economy	22.70	115
5.2.3 Skills matching with secondary education	21.60	122
5.2.4 Skills matching with tertiary education.....	35.25	119

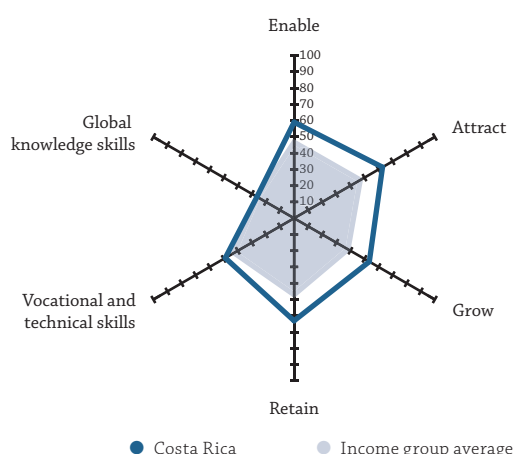
6 GLOBAL KNOWLEDGE SKILLS	5.90	128
6.1 High-Level Skills	11.72	118
6.1.1 Workforce with tertiary education	8.77	107
6.1.2 Population with tertiary education.....	13.19	84
6.1.3 Professionals	5.41	119
6.1.4 Researchers	0.00	110
6.1.5 Senior officials and managers	6.50	105
6.1.6 Availability of scientists and engineers.....	36.43	98
6.2 Talent Impact.....	0.08	131
6.2.1 Innovation output	n/a	n/a
6.2.2 High-value exports.....	n/a	n/a
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density	0.14	105
6.2.5 Scientific journal articles	0.02	130

COSTA RICA

Key Indicators

Rank (out of 132).....	37
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	5.00

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	59.09	39
1.1 Regulatory Landscape.....	61.58	44
1.1.1 Government effectiveness.....	52.54	56
1.1.2 Rule of law.....	63.29	43
1.1.3 Political stability.....	76.22	39
1.1.4 Regulatory quality.....	59.08	47
1.1.5 Corruption.....	56.76	41
1.2 Market Landscape.....	56.52	48
1.2.1 Competition intensity.....	76.00	38
1.2.2 Ease of doing business.....	68.38	62
1.2.3 Cluster development.....	48.71	49
1.2.4 R&D expenditure.....	9.72	66
1.2.5 ICT infrastructure.....	60.05	63
1.2.6 Urban population.....	76.24	36
1.3 Business and Labour Landscape.....	59.18	31
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	82.49	57
1.3.2 Active labour market policies.....	29.81	96
1.3.3 Labour-employer cooperation.....	65.23	21
1.3.4 Management Practice		
1.3.4 Professional management.....	65.63	33
1.3.5 Relationship of pay to productivity.....	57.18	50
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	65.53	41
1.3.7 Investment in emerging technologies.....	48.38	47
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	62.82	29
2.1 External Openness.....	53.83	34
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	77.71	21
2.1.2 Prevalence of foreign ownership.....	74.86	32
2.1.3 Attract People		
2.1.3 Migrant stock.....	55.15	43
2.1.4 International students.....	4.68	79
2.1.5 Brain gain.....	56.76	36
2.2 Internal Openness.....	71.80	22
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	71.11	27
2.2.2 Tolerance of immigrants.....	79.45	25
2.2.3 Social mobility.....	69.31	32
2.2.4 Gender Equality		
2.2.4 Female graduates.....	85.83	23
2.2.5 Gender development gap.....	79.76	58
2.2.6 Leadership opportunities for women.....	45.36	66

GDP per capita (PPP US\$).....	17,645.10
GDP (US\$ billions).....	60.13
GTCI score.....	52.29
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	53.45	30
3.1 Formal Education.....	35.02	45
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	37.59	28
3.1.2 Tertiary enrolment.....	43.66	51
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	42.13	12
3.1.4 Reading, maths, and science.....	36.10	53
3.1.5 University ranking.....	15.64	57
3.2 Lifelong Learning.....	64.89	25
3.2.1 Quality of management schools.....	71.62	25
3.2.2 Prevalence of training in firms.....	67.68	15
3.2.3 Employee development.....	55.38	35
3.3 Access to Growth Opportunities.....	60.42	30
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	61.91	32
3.3.2 Personal rights.....	95.65	20
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	90.83	12
3.3.4 Use of virtual professional networks.....	18.04	36
3.3.5 Collaboration within organisations.....	52.39	47
3.3.6 Collaboration across organisations.....	43.72	51

4 RETAIN.....	63.08	36
4.1 Sustainability.....	68.26	25
4.1.1 Pension system.....	71.92	35
4.1.2 Social protection.....	69.36	28
4.1.3 Brain retention.....	63.50	31
4.2 Lifestyle.....	57.90	57
4.2.1 Environmental performance.....	67.38	29
4.2.2 Personal safety.....	49.14	74
4.2.3 Physician density.....	18.14	80
4.2.4 Sanitation.....	96.93	45

5 VOCATIONAL AND TECHNICAL SKILLS.....	48.89	50
5.1 Mid-Level Skills.....	28.55	88
5.1.1 Workforce with secondary education.....	25.67	101
5.1.2 Population with secondary education.....	22.70	94
5.1.3 Technicians and associate professionals.....	42.30	51
5.1.4 Labour productivity per employee.....	23.52	62
5.2 Employability.....	69.24	23
5.2.1 Ease of finding skilled employees.....	77.84	17
5.2.2 Relevance of education system to the economy.....	56.61	41
5.2.3 Skills matching with secondary education.....	65.28	26
5.2.4 Skills matching with tertiary education.....	77.21	21

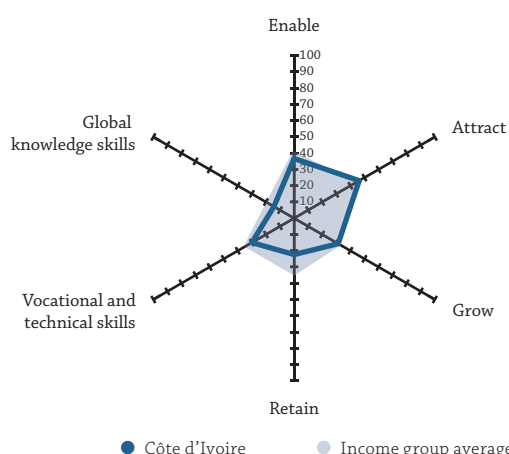
6 GLOBAL KNOWLEDGE SKILLS.....	26.40	68
6.1 High-Level Skills.....	28.96	68
6.1.1 Workforce with tertiary education.....	28.44	67
6.1.2 Population with tertiary education.....	33.45	44
6.1.3 Professionals.....	32.83	50
6.1.4 Researchers.....	6.30	66
6.1.5 Senior officials and managers.....	10.27	95
6.1.6 Availability of scientists and engineers.....	62.45	38
6.2 Talent Impact.....	23.85	62
6.2.1 Innovation output.....	40.11	47
6.2.2 High-value exports.....	22.05	55
6.2.3 New product entrepreneurial activity.....	44.02	50
6.2.4 New business density.....	10.08	48
6.2.5 Scientific journal articles.....	3.01	78

CÔTE D'IVOIRE

Key Indicators

Rank (out of 132).....	108
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	25.07

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	36.72	104
1.1 Regulatory Landscape.....	35.02	107
1.1.1 Government effectiveness.....	28.57	116
1.1.2 Rule of law.....	37.93	102
1.1.3 Political stability.....	41.00	119
1.1.4 Regulatory quality.....	39.20	97
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	35.55	108
1.2.1 Competition intensity.....	71.61	56
1.2.2 Ease of doing business.....	48.93	102
1.2.3 Cluster development.....	19.16	120
1.2.4 R&D expenditure.....	1.71	110
1.2.5 ICT infrastructure.....	28.50	103
1.2.6 Urban population.....	43.40	95
1.3 Business and Labour Landscape.....	39.59	86
Labour Market		
1.3.1 Tertiary-educated unemployment.....	59.13	104
1.3.2 Active labour market policies.....	11.70	123
1.3.3 Labour-employer cooperation.....	48.06	45
Management Practice		
1.3.4 Professional management.....	43.09	82
1.3.5 Relationship of pay to productivity.....	30.67	117
Technology Adoption		
1.3.6 Technology utilisation.....	56.04	54
1.3.7 Investment in emerging technologies.....	28.47	98
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	46.24	79
2.1 External Openness.....	49.41	45
Attract Business		
2.1.1 FDI and technology transfer.....	53.74	77
2.1.2 Prevalence of foreign ownership.....	74.98	30
Attract People		
2.1.3 Migrant stock.....	65.40	22
2.1.4 International students.....	7.74	68
2.1.5 Brain gain.....	45.18	64
2.2 Internal Openness.....	43.08	114
Social Inclusion		
2.2.1 Tolerance of minorities.....	27.78	95
2.2.2 Tolerance of immigrants.....	63.01	58
2.2.3 Social mobility.....	53.74	77
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	32.19	127
2.2.6 Leadership opportunities for women.....	38.67	86

GDP per capita (PPP US\$).....	4,199.67
GDP (US\$ billions).....	43.01
GTGI score.....	30.16
GTGI score (income group average).....	32.97

	Score	Rank
3 GROW.....	31.32	93
3.1 Formal Education.....	9.71	112
Enrolment		
3.1.1 Vocational enrolment.....	8.67	86
3.1.2 Tertiary enrolment.....	6.68	110
Quality		
3.1.3 Tertiary education expenditure.....	23.51	53
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	43.67	65
3.2.1 Quality of management schools.....	42.64	83
3.2.2 Prevalence of training in firms.....	42.35	39
3.2.3 Employee development.....	46.01	54
3.3 Access to Growth Opportunities.....	40.57	95
Empowerment		
3.3.1 Delegation of authority.....	31.72	110
3.3.2 Personal rights.....	60.61	87
Collaboration		
3.3.3 Use of virtual social networks.....	71.31	73
3.3.4 Use of virtual professional networks.....	2.62	97
3.3.5 Collaboration within organisations.....	58.26	39
3.3.6 Collaboration across organisations.....	18.87	122

4 RETAIN.....	22.35	118
4.1 Sustainability.....	21.46	115
4.1.1 Pension system.....	8.80	97
4.1.2 Social protection.....	23.41	111
4.1.3 Brain retention.....	32.18	91
4.2 Lifestyle.....	23.24	120
4.2.1 Environmental performance.....	29.70	108
4.2.2 Personal safety.....	36.64	99
4.2.3 Physician density.....	2.00	108
4.2.4 Sanitation.....	24.59	122

5 VOCATIONAL AND TECHNICAL SKILLS.....	29.97	108
5.1 Mid-Level Skills.....	14.60	112
5.1.1 Workforce with secondary education.....	26.53	98
5.1.2 Population with secondary education.....	7.04	107
5.1.3 Technicians and associate professionals.....	18.14	96
5.1.4 Labour productivity per employee.....	6.67	94
5.2 Employability.....	45.34	77
5.2.1 Ease of finding skilled employees.....	69.67	34
5.2.2 Relevance of education system to the economy.....	32.99	95
5.2.3 Skills matching with secondary education.....	32.79	93
5.2.4 Skills matching with tertiary education.....	45.90	91

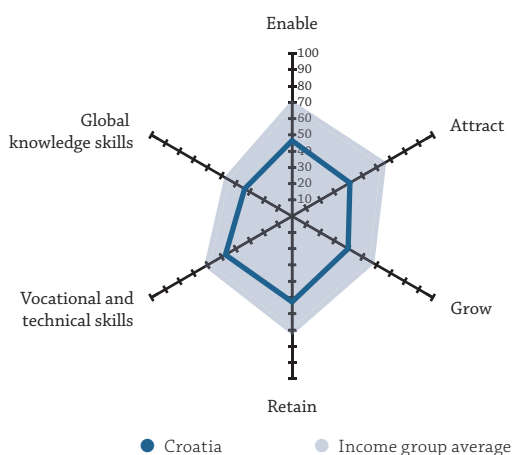
6 GLOBAL KNOWLEDGE SKILLS.....	14.34	105
6.1 High-Level Skills.....	16.88	104
6.1.1 Workforce with tertiary education.....	8.92	106
6.1.2 Population with tertiary education.....	6.93	94
6.1.3 Professionals.....	11.65	108
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	5.66	109
6.1.6 Availability of scientists and engineers.....	51.25	62
6.2 Talent Impact.....	11.80	100
6.2.1 Innovation output.....	21.54	89
6.2.2 High-value exports.....	13.61	79
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.25	117

CROATIA

Key Indicators

Rank (out of 132).....	59
Income group.....	High income
Regional group.....	Europe
Population (millions).....	4.09

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	46.51	76
1.1 Regulatory Landscape.....	61.36	46
1.1.1 Government effectiveness.....	60.52	40
1.1.2 Rule of law.....	60.47	49
1.1.3 Political stability.....	81.38	30
1.1.4 Regulatory quality.....	58.50	48
1.1.5 Corruption.....	45.95	51
1.2 Market Landscape.....	47.11	74
1.2.1 Competition intensity.....	49.57	117
1.2.2 Ease of doing business.....	72.87	54
1.2.3 Cluster development.....	15.66	123
1.2.4 R&D expenditure.....	18.75	41
1.2.5 ICT infrastructure.....	75.32	33
1.2.6 Urban population.....	50.50	82
1.3 Business and Labour Landscape.....	31.05	116
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	80.20	66
1.3.2 Active labour market policies.....	36.75	73
1.3.3 Labour-employer cooperation.....	0.30	131
1.3.4 Management Practice		
1.3.4 Professional management.....	26.46	121
1.3.5 Relationship of pay to productivity.....	32.58	111
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	44.79	82
1.3.7 Investment in emerging technologies.....	25.34	106
1.3.8 Robot density.....	2.01	45
2 ATTRACT.....	41.07	104
2.1 External Openness.....	33.28	101
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	39.20	111
2.1.2 Prevalence of foreign ownership.....	53.42	83
2.1.3 Attract People		
2.1.3 Migrant stock.....	62.44	28
2.1.4 International students.....	1.47	95
2.1.5 Brain gain.....	9.88	129
2.2 Internal Openness.....	48.86	98
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	53.33	50
2.2.2 Tolerance of immigrants.....	13.70	123
2.2.3 Social mobility.....	41.36	114
2.2.4 Gender Equality		
2.2.4 Female graduates.....	80.03	33
2.2.5 Gender development gap.....	85.74	28
2.2.6 Leadership opportunities for women.....	19.00	120

GDP per capita (PPP US\$).....	26,295.51
GDP (US\$ billions).....	60.81
GTCI score.....	43.53
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	39.83	62
3.1 Formal Education.....	43.25	33
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	61.59	6
3.1.2 Tertiary enrolment.....	53.11	31
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	22.51	56
3.1.4 Reading, maths, and science.....	64.16	33
3.1.5 University ranking.....	14.86	59
3.2 Lifelong Learning.....	36.88	86
3.2.1 Quality of management schools.....	36.27	99
3.2.2 Prevalence of training in firms.....	60.55	22
3.2.3 Employee development.....	13.81	126
3.3 Access to Growth Opportunities.....	39.37	101
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	24.60	118
3.3.2 Personal rights.....	83.49	46
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	68.72	84
3.3.4 Use of virtual professional networks.....	15.81	42
3.3.5 Collaboration within organisations.....	28.08	123
3.3.6 Collaboration across organisations.....	15.49	129

4 RETAIN.....	52.70	59
4.1 Sustainability.....	36.88	77
4.1.1 Pension system.....	77.00	30
4.1.2 Social protection.....	29.21	101
4.1.3 Brain retention.....	4.43	129
4.2 Lifestyle.....	68.52	37
4.2.1 Environmental performance.....	63.38	37
4.2.2 Personal safety.....	63.59	45
4.2.3 Physician density.....	49.82	33
4.2.4 Sanitation.....	97.27	44

5 VOCATIONAL AND TECHNICAL SKILLS.....	47.35	54
5.1 Mid-Level Skills.....	64.27	15
5.1.1 Workforce with secondary education.....	84.25	9
5.1.2 Population with secondary education.....	73.59	15
5.1.3 Technicians and associate professionals.....	62.68	21
5.1.4 Labour productivity per employee.....	36.54	47
5.2 Employability.....	30.43	121
5.2.1 Ease of finding skilled employees.....	33.79	118
5.2.2 Relevance of education system to the economy.....	21.40	117
5.2.3 Skills matching with secondary education.....	32.89	92
5.2.4 Skills matching with tertiary education.....	33.65	121

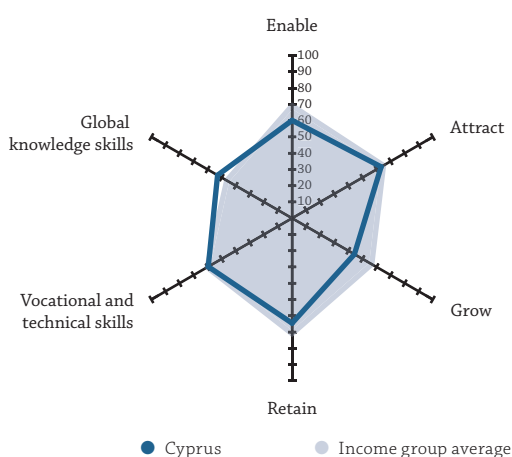
6 GLOBAL KNOWLEDGE SKILLS.....	33.73	50
6.1 High-Level Skills.....	33.45	55
6.1.1 Workforce with tertiary education.....	43.28	42
6.1.2 Population with tertiary education.....	28.27	60
6.1.3 Professionals.....	46.34	33
6.1.4 Researchers.....	22.51	41
6.1.5 Senior officials and managers.....	29.25	51
6.1.6 Availability of scientists and engineers.....	31.03	112
6.2 Talent Impact.....	34.01	41
6.2.1 Innovation output.....	38.35	51
6.2.2 High-value exports.....	22.18	53
6.2.3 New product entrepreneurial activity.....	47.21	44
6.2.4 New business density.....	23.83	26
6.2.5 Scientific journal articles.....	38.48	30

CYPRUS

Key Indicators

Rank (out of 132).....	30
Income group	High income
Regional group	Northern Africa and Western Asia
Population (millions)	1.19

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	60.21	37
1.1 Regulatory Landscape.....	70.91	31
1.1.1 Government effectiveness.....	68.85	32
1.1.2 Rule of law.....	73.33	32
1.1.3 Political stability.....	78.20	35
1.1.4 Regulatory quality.....	73.37	30
1.1.5 Corruption.....	60.81	33
1.2 Market Landscape.....	58.37	43
1.2.1 Competition intensity.....	81.32	19
1.2.2 Ease of doing business.....	73.42	53
1.2.3 Cluster development.....	42.95	65
1.2.4 R&D expenditure.....	12.08	55
1.2.5 ICT infrastructure.....	78.63	30
1.2.6 Urban population.....	61.84	62
1.3 Business and Labour Landscape.....	51.33	51
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	75.06	83
1.3.2 Active labour market policies.....	58.15	43
1.3.3 Labour-employer cooperation.....	53.71	35
1.3.4 Management Practice		
1.3.4 Professional management.....	36.22	98
1.3.5 Relationship of pay to productivity.....	46.46	70
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	58.34	51
1.3.7 Investment in emerging technologies.....	31.37	91
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	63.25	27
2.1 External Openness.....	60.60	24
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	57.07	64
2.1.2 Prevalence of foreign ownership.....	71.33	39
2.1.3 Attract People		
2.1.3 Migrant stock.....	64.69	23
2.1.4 International students.....	64.36	8
2.1.5 Brain gain.....	45.57	62
2.2 Internal Openness.....	65.89	37
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	47.78	62
2.2.2 Tolerance of immigrants.....	67.12	46
2.2.3 Social mobility.....	61.48	50
2.2.4 Gender Equality		
2.2.4 Female graduates.....	91.88	9
2.2.5 Gender development gap.....	83.06	42
2.2.6 Leadership opportunities for women.....	44.01	71

GDP per capita (PPP US\$)	36,155.48
GDP (US\$ billions)	24.47
GTCI score.....	57.47
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....	44.28	47
3.1 Formal Education.....	27.41	63
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	12.62	77
3.1.2 Tertiary enrolment.....	47.23	44
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	30.86	33
3.1.4 Reading, maths, and science.....	46.33	44
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	53.99	41
3.2.1 Quality of management schools.....	58.65	44
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	49.32	46
3.3 Access to Growth Opportunities.....	51.44	49
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	41.02	79
3.3.2 Personal rights.....	93.54	28
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	76.58	58
3.3.4 Use of virtual professional networks.....	21.86	30
3.3.5 Collaboration within organisations.....	46.66	68
3.3.6 Collaboration across organisations.....	28.99	95

4 RETAIN.....	64.58	32
4.1 Sustainability.....	57.35	41
4.1.1 Pension system.....	67.36	41
4.1.2 Social protection.....	52.93	44
4.1.3 Brain retention.....	51.75	44
4.2 Lifestyle.....	71.81	31
4.2.1 Environmental performance.....	75.30	23
4.2.2 Personal safety.....	72.92	30
4.2.3 Physician density.....	39.72	49
4.2.4 Sanitation.....	99.32	24

5 VOCATIONAL AND TECHNICAL SKILLS.....	59.58	28
5.1 Mid-Level Skills.....	50.93	47
5.1.1 Workforce with secondary education.....	52.44	53
5.1.2 Population with secondary education.....	48.30	49
5.1.3 Technicians and associate professionals.....	55.60	33
5.1.4 Labour productivity per employee.....	47.36	28
5.2 Employability.....	68.23	24
5.2.1 Ease of finding skilled employees.....	73.49	25
5.2.2 Relevance of education system to the economy.....	56.26	42
5.2.3 Skills matching with secondary education.....	69.30	16
5.2.4 Skills matching with tertiary education.....	73.87	28

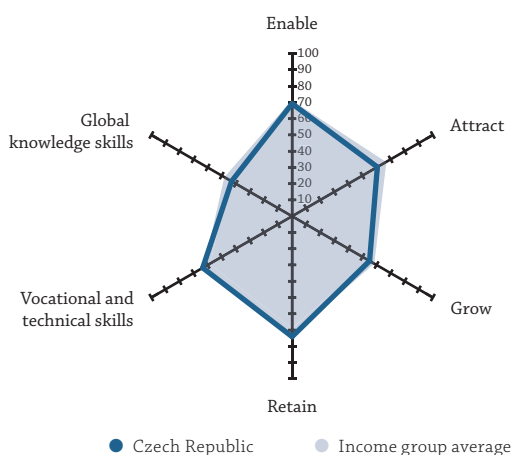
6 GLOBAL KNOWLEDGE SKILLS.....	52.95	19
6.1 High-Level Skills.....	47.83	31
6.1.1 Workforce with tertiary education.....	69.05	8
6.1.2 Population with tertiary education.....	58.19	15
6.1.3 Professionals.....	49.44	25
6.1.4 Researchers.....	14.12	48
6.1.5 Senior officials and managers.....	22.89	63
6.1.6 Availability of scientists and engineers.....	73.29	17
6.2 Talent Impact.....	58.06	13
6.2.1 Innovation output.....	60.77	22
6.2.2 High-value exports.....	37.91	29
6.2.3 New product entrepreneurial activity.....	78.95	9
6.2.4 New business density.....	79.75	4
6.2.5 Scientific journal articles.....	32.92	32

CZECH REPUBLIC

Key Indicators

Rank (out of 132).....	25
Income group.....	High income
Regional group.....	Europe
Population (millions).....	10.63

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....69.23	25	
1.1 Regulatory Landscape.....	75.31	25
1.1.1 Government effectiveness.....	71.34	29
1.1.2 Rule of law.....	78.74	25
1.1.3 Political stability.....	87.31	18
1.1.4 Regulatory quality.....	78.34	24
1.1.5 Corruption.....	60.81	33
1.2 Market Landscape.....	65.79	27
1.2.1 Competition intensity.....	84.98	14
1.2.2 Ease of doing business.....	81.26	33
1.2.3 Cluster development.....	50.22	45
1.2.4 R&D expenditure.....	38.97	20
1.2.5 ICT infrastructure.....	69.47	48
1.2.6 Urban population.....	69.86	47
1.3 Business and Labour Landscape.....	66.59	23
Labour Market		
1.3.1 Tertiary-educated unemployment.....	96.23	4
1.3.2 Active labour market policies.....	76.80	17
1.3.3 Labour-employer cooperation.....	52.30	37
Management Practice		
1.3.4 Professional management.....	78.63	22
1.3.5 Relationship of pay to productivity.....	65.77	32
Technology Adoption		
1.3.6 Technology utilisation.....	67.76	34
1.3.7 Investment in emerging technologies.....	55.17	35
1.3.8 Robot density.....	40.05	19
2 ATTRACT.....60.59	33	
2.1 External Openness.....	57.62	28
Attract Business		
2.1.1 FDI and technology transfer.....	70.25	38
2.1.2 Prevalence of foreign ownership.....	94.05	5
Attract People		
2.1.3 Migrant stock.....	38.31	69
2.1.4 International students.....	42.22	15
2.1.5 Brain gain.....	43.27	68
2.2 Internal Openness.....	63.56	45
Social Inclusion		
2.2.1 Tolerance of minorities.....	57.78	45
2.2.2 Tolerance of immigrants.....	15.07	121
2.2.3 Social mobility.....	77.50	22
Gender Equality		
2.2.4 Female graduates.....	84.16	24
2.2.5 Gender development gap.....	83.74	39
2.2.6 Leadership opportunities for women.....	63.12	34

GDP per capita (PPP US\$).....	39,998.43
GDP (US\$ billions).....	244.11
GTCI score.....	60.91
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....55.04	27	
3.1 Formal Education.....	45.29	28
Enrolment		
3.1.1 Vocational enrolment.....	57.87	10
3.1.2 Tertiary enrolment.....	50.13	37
Quality		
3.1.3 Tertiary education expenditure.....	16.69	76
3.1.4 Reading, maths, and science.....	71.39	27
3.1.5 University ranking.....	30.36	40
3.2 Lifelong Learning.....	58.88	30
3.2.1 Quality of management schools.....	49.69	58
3.2.2 Prevalence of training in firms.....	68.21	14
3.2.3 Employee development.....	58.74	31
3.3 Access to Growth Opportunities.....	60.94	29
Empowerment		
3.3.1 Delegation of authority.....	66.57	26
3.3.2 Personal rights.....	92.98	29
Collaboration		
3.3.3 Use of virtual social networks.....	85.87	28
3.3.4 Use of virtual professional networks.....	15.63	43
3.3.5 Collaboration within organisations.....	61.09	33
3.3.6 Collaboration across organisations.....	43.50	53

4 RETAIN.....74.10	22	
4.1 Sustainability.....	70.50	23
4.1.1 Pension system.....	92.00	12
4.1.2 Social protection.....	70.38	26
4.1.3 Brain retention.....	49.12	48
4.2 Lifestyle.....	77.70	19
4.2.1 Environmental performance.....	67.09	32
4.2.2 Personal safety.....	85.98	16
4.2.3 Physician density.....	58.66	18
4.2.4 Sanitation.....	99.07	29

5 VOCATIONAL AND TECHNICAL SKILLS.....63.49	21	
5.1 Mid-Level Skills.....	78.06	2
5.1.1 Workforce with secondary education.....	95.36	3
5.1.2 Population with secondary education.....	98.90	2
5.1.3 Technicians and associate professionals.....	75.49	12
5.1.4 Labour productivity per employee.....	42.47	37
5.2 Employability.....	48.93	66
5.2.1 Ease of finding skilled employees.....	33.67	119
5.2.2 Relevance of education system to the economy.....	43.21	68
5.2.3 Skills matching with secondary education.....	57.09	36
5.2.4 Skills matching with tertiary education.....	61.74	47

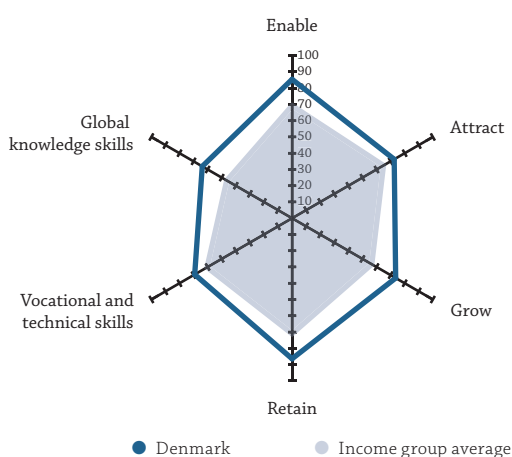
6 GLOBAL KNOWLEDGE SKILLS.....43.00	30	
6.1 High-Level Skills.....	38.54	44
6.1.1 Workforce with tertiary education.....	36.94	52
6.1.2 Population with tertiary education.....	31.47	51
6.1.3 Professionals.....	41.90	39
6.1.4 Researchers.....	44.65	25
6.1.5 Senior officials and managers.....	27.46	56
6.1.6 Availability of scientists and engineers.....	48.81	67
6.2 Talent Impact.....	47.47	23
6.2.1 Innovation output.....	64.80	19
6.2.2 High-value exports.....	39.73	26
6.2.3 New product entrepreneurial activity.....	53.81	40
6.2.4 New business density.....	19.15	30
6.2.5 Scientific journal articles.....	59.86	13

DENMARK

Key Indicators

Rank (out of 132).....	5
Income group	High income
Regional group	Europe
Population (millions)	5.80

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 85.45 6		
1.1 Regulatory Landscape..... 91.64 9		
1.1.1 Government effectiveness..... 90.10 8		
1.1.2 Rule of law..... 96.19 6		
1.1.3 Political stability..... 84.02 26		
1.1.4 Regulatory quality..... 87.88 15		
1.1.5 Corruption..... 100.00 1		
1.2 Market Landscape..... 80.27 9		
1.2.1 Competition intensity..... 72.71 49		
1.2.2 Ease of doing business..... 96.52 3		
1.2.3 Cluster development..... 73.27 18		
1.2.4 R&D expenditure..... 67.70 7		
1.2.5 ICT infrastructure..... 85.37 13		
1.2.6 Urban population..... 86.06 16		
1.3 Business and Labour Landscape..... 84.44 6		
Labour Market		
1.3.1 Tertiary-educated unemployment..... 86.73 42		
1.3.2 Active labour market policies..... 88.94 7		
1.3.3 Labour-employer cooperation..... 89.37 4		
Management Practice		
1.3.4 Professional management..... 92.99 9		
1.3.5 Relationship of pay to productivity..... 77.95 8		
Technology Adoption		
1.3.6 Technology utilisation..... 91.77 8		
1.3.7 Investment in emerging technologies..... 76.91 14		
1.3.8 Robot density..... 70.85 6		
2 ATTRACT..... 72.55 14		
2.1 External Openness..... 65.12 18		
Attract Business		
2.1.1 FDI and technology transfer..... 82.89 13		
2.1.2 Prevalence of foreign ownership..... 84.12 11		
Attract People		
2.1.3 Migrant stock..... 57.92 37		
2.1.4 International students..... 39.65 16		
2.1.5 Brain gain..... 61.06 28		
2.2 Internal Openness..... 79.97 11		
Social Inclusion		
2.2.1 Tolerance of minorities..... 63.33 38		
2.2.2 Tolerance of immigrants..... 91.78 8		
2.2.3 Social mobility..... 91.36 8		
Gender Equality		
2.2.4 Female graduates..... 71.21 66		
2.2.5 Gender development gap..... 81.67 46		
2.2.6 Leadership opportunities for women..... 80.45 12		

GDP per capita (PPP US\$)	56,120.13
GDP (US\$ billions)	351.30
GTGI score.....	75.18
GTGI score (income group average)	61.46

	Score	Rank
3 GROW..... 73.60 7		
3.1 Formal Education..... 58.40 9		
Enrolment		
3.1.1 Vocational enrolment..... 34.89 29		
3.1.2 Tertiary enrolment..... 63.91 17		
Quality		
3.1.3 Tertiary education expenditure..... 57.25 2		
3.1.4 Reading, maths, and science..... 77.73 15		
3.1.5 University ranking..... 58.22 14		
3.2 Lifelong Learning..... 80.47 7		
3.2.1 Quality of management schools..... 78.87 11		
3.2.2 Prevalence of training in firms..... n/a n/a		
3.2.3 Employee development..... 82.06 8		
3.3 Access to Growth Opportunities..... 81.94 4		
Empowerment		
3.3.1 Delegation of authority..... 100.00 1		
3.3.2 Personal rights..... 96.57 14		
Collaboration		
3.3.3 Use of virtual social networks..... 83.86 37		
3.3.4 Use of virtual professional networks..... 56.94 8		
3.3.5 Collaboration within organisations..... 88.36 7		
3.3.6 Collaboration across organisations..... 65.89 17		

4 RETAIN..... 86.47 3		
4.1 Sustainability..... 89.21 5		
4.1.1 Pension system..... 96.60 7		
4.1.2 Social protection..... 99.20 2		
4.1.3 Brain retention..... 71.85 21		
4.2 Lifestyle..... 83.72 8		
4.2.1 Environmental performance..... 90.30 3		
4.2.2 Personal safety..... 86.70 15		
4.2.3 Physician density..... 58.31 19		
4.2.4 Sanitation..... 99.57 19		

5 VOCATIONAL AND TECHNICAL SKILLS..... 69.20 10		
5.1 Mid-Level Skills..... 62.18 20		
5.1.1 Workforce with secondary education..... 56.02 46		
5.1.2 Population with secondary education..... 57.83 33		
5.1.3 Technicians and associate professionals..... 76.22 11		
5.1.4 Labour productivity per employee..... 58.66 17		
5.2 Employability..... 76.21 14		
5.2.1 Ease of finding skilled employees..... 75.58 20		
5.2.2 Relevance of education system to the economy..... 74.07 12		
5.2.3 Skills matching with secondary education..... 71.58 11		
5.2.4 Skills matching with tertiary education..... 83.61 11		

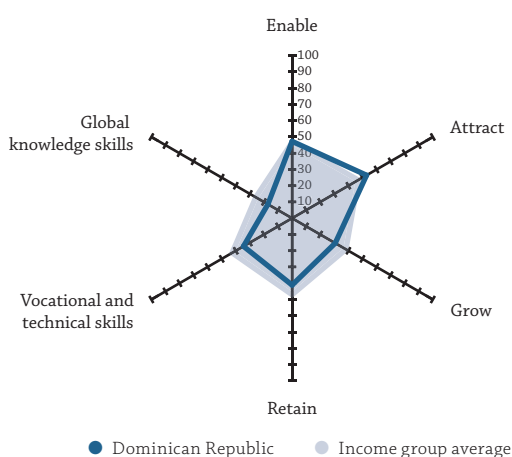
6 GLOBAL KNOWLEDGE SKILLS..... 63.82 6		
6.1 High-Level Skills..... 59.09 15		
6.1.1 Workforce with tertiary education..... 54.23 25		
6.1.2 Population with tertiary education..... 56.42 16		
6.1.3 Professionals..... 70.74 4		
6.1.4 Researchers..... 95.71 2		
6.1.5 Senior officials and managers..... 15.04 80		
6.1.6 Availability of scientists and engineers..... 62.43 39		
6.2 Talent Impact..... 68.55 1		
6.2.1 Innovation output..... 71.98 12		
6.2.2 High-value exports..... 33.47 35		
6.2.3 New product entrepreneurial activity..... 96.38 4		
6.2.4 New business density..... 47.73 12		
6.2.5 Scientific journal articles..... 93.20 2		

DOMINICAN REPUBLIC

Key Indicators

Rank (out of 132).....	81
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	10.63

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.32	67	
1.1 Regulatory Landscape.....	43.44	83
1.1.1 Government effectiveness.....	37.98	92
1.1.2 Rule of law.....	42.90	94
1.1.3 Political stability.....	68.53	59
1.1.4 Regulatory quality.....	46.15	73
1.1.5 Corruption.....	21.62	106
1.2 Market Landscape.....	56.38	49
1.2.1 Competition intensity.....	71.77	55
1.2.2 Ease of doing business.....	54.50	88
1.2.3 Cluster development.....	44.06	57
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	33.33	98
1.2.6 Urban population.....	78.24	31
1.3 Business and Labour Landscape.....	42.14	79
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	83.14	54
1.3.2 Active labour market policies.....	14.21	115
1.3.3 Labour-employer cooperation.....	40.08	60
1.3.4 Management Practice		
1.3.4 Professional management.....	40.38	90
1.3.5 Relationship of pay to productivity.....	37.98	95
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	50.03	96
1.3.7 Investment in emerging technologies.....	29.14	97
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....52.91	53	
2.1 External Openness.....	45.12	60
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	68.81	40
2.1.2 Prevalence of foreign ownership.....	69.26	42
2.1.3 Attract People		
2.1.3 Migrant stock.....	39.15	66
2.1.4 International students.....	6.25	74
2.1.5 Brain gain.....	42.13	73
2.2 Internal Openness.....	60.69	53
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	53.33	50
2.2.2 Tolerance of immigrants.....	56.16	74
2.2.3 Social mobility.....	45.93	101
2.2.4 Gender Equality		
2.2.4 Female graduates.....	95.18	5
2.2.5 Gender development gap.....	85.13	33
2.2.6 Leadership opportunities for women.....	28.41	107

GDP per capita (PPP US\$).....	17,798.81
GDP (US\$ billions).....	81.30
GTCI score.....	37.29
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....30.65	96	
3.1 Formal Education.....	13.80	96
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	8.10	89
3.1.2 Tertiary enrolment.....	47.08	45
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	0.00	67
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	33.98	102
3.2.1 Quality of management schools.....	39.15	90
3.2.2 Prevalence of training in firms.....	26.39	70
3.2.3 Employee development.....	36.42	70
3.3 Access to Growth Opportunities.....	44.18	82
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	41.37	78
3.3.2 Personal rights.....	80.26	53
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	71.11	75
3.3.4 Use of virtual professional networks.....	7.51	70
3.3.5 Collaboration within organisations.....	38.44	98
3.3.6 Collaboration across organisations.....	26.37	104

4 RETAIN.....41.12	86	
4.1 Sustainability.....	32.67	94
4.1.1 Pension system.....	32.06	66
4.1.2 Social protection.....	31.96	89
4.1.3 Brain retention.....	33.99	84
4.2 Lifestyle.....	49.58	83
4.2.1 Environmental performance.....	62.14	41
4.2.2 Personal safety.....	31.14	108
4.2.3 Physician density.....	23.65	74
4.2.4 Sanitation.....	81.38	83

5 VOCATIONAL AND TECHNICAL SKILLS.....34.54	93	
5.1 Mid-Level Skills.....	30.64	83
5.1.1 Workforce with secondary education.....	43.12	71
5.1.2 Population with secondary education.....	30.85	71
5.1.3 Technicians and associate professionals.....	25.84	77
5.1.4 Labour productivity per employee.....	22.75	64
5.2 Employability.....	38.44	95
5.2.1 Ease of finding skilled employees.....	52.47	76
5.2.2 Relevance of education system to the economy.....	24.46	114
5.2.3 Skills matching with secondary education.....	30.43	103
5.2.4 Skills matching with tertiary education.....	46.42	86

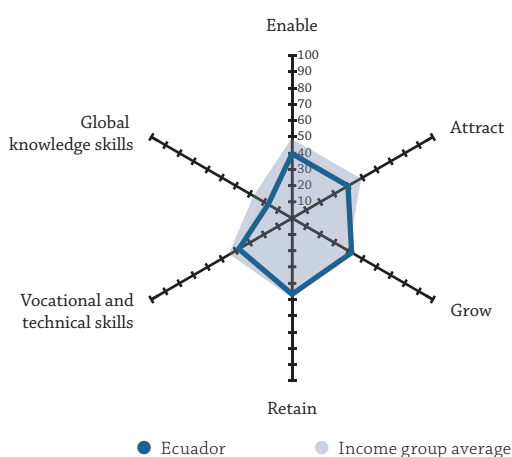
6 GLOBAL KNOWLEDGE SKILLS.....17.18	92	
6.1 High-Level Skills.....	21.23	90
6.1.1 Workforce with tertiary education.....	18.03	90
6.1.2 Population with tertiary education.....	18.55	75
6.1.3 Professionals.....	19.78	79
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	11.69	87
6.1.6 Availability of scientists and engineers.....	38.09	95
6.2 Talent Impact.....	13.14	94
6.2.1 Innovation output.....	22.42	86
6.2.2 High-value exports.....	23.00	51
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	7.07	61
6.2.5 Scientific journal articles.....	0.07	129

ECUADOR

Key Indicators

Rank (out of 132).....	82
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	17.08

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	39.69	96
1.1 Regulatory Landscape.....	37.67	100
1.1.1 Government effectiveness.....	38.77	91
1.1.2 Rule of law.....	36.29	108
1.1.3 Political stability.....	62.81	72
1.1.4 Regulatory quality.....	23.48	123
1.1.5 Corruption.....	27.03	95
1.2 Market Landscape.....	42.48	89
1.2.1 Competition intensity.....	70.80	61
1.2.2 Ease of doing business.....	48.82	103
1.2.3 Cluster development.....	26.13	107
1.2.4 R&D expenditure.....	9.38	68
1.2.5 ICT infrastructure.....	41.35	82
1.2.6 Urban population.....	58.40	67
1.3 Business and Labour Landscape.....	38.90	88
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	82.68	56
1.3.2 Active labour market policies.....	13.85	117
1.3.3 Labour-employer cooperation.....	36.69	73
1.3.4 Management Practice		
1.3.4 Professional management.....	28.80	114
1.3.5 Relationship of pay to productivity.....	40.53	87
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	46.44	74
1.3.7 Investment in emerging technologies.....	23.33	111
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	39.72	107
2.1 External Openness.....	26.56	119
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	36.46	118
2.1.2 Prevalence of foreign ownership.....	30.09	122
2.1.3 Attract People		
2.1.3 Migrant stock.....	26.47	91
2.1.4 International students.....	2.75	87
2.1.5 Brain gain.....	37.01	89
2.2 Internal Openness.....	52.89	87
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	36.67	81
2.2.2 Tolerance of immigrants.....	54.79	78
2.2.3 Social mobility.....	41.27	115
2.2.4 Gender Equality		
2.2.4 Female graduates.....	74.52	56
2.2.5 Gender development gap.....	81.14	49
2.2.6 Leadership opportunities for women.....	28.96	104

GDP per capita (PPP US\$).....	11,713.69
GDP (US\$ billions).....	108.40
GTGI score.....	37.22
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	42.33	52
3.1 Formal Education.....	31.11	52
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	23.37	51
3.1.2 Tertiary enrolment.....	35.65	63
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	52.92	4
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	12.50	65
3.2 Lifelong Learning.....	54.27	39
3.2.1 Quality of management schools.....	44.14	79
3.2.2 Prevalence of training in firms.....	92.74	2
3.2.3 Employee development.....	25.92	108
3.3 Access to Growth Opportunities.....	41.61	91
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	33.92	101
3.3.2 Personal rights.....	77.36	62
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	67.44	86
3.3.4 Use of virtual professional networks.....	12.01	53
3.3.5 Collaboration within organisations.....	30.84	113
3.3.6 Collaboration across organisations.....	28.07	99

4 RETAIN.....	46.74	67
4.1 Sustainability.....	42.56	65
4.1.1 Pension system.....	42.05	60
4.1.2 Social protection.....	46.66	55
4.1.3 Brain retention.....	38.97	72
4.2 Lifestyle.....	50.91	78
4.2.1 Environmental performance.....	49.99	75
4.2.2 Personal safety.....	42.17	90
4.2.3 Physician density.....	26.40	69
4.2.4 Sanitation.....	85.08	77

5 VOCATIONAL AND TECHNICAL SKILLS.....	37.83	80
5.1 Mid-Level Skills.....	28.84	86
5.1.1 Workforce with secondary education.....	42.05	73
5.1.2 Population with secondary education.....	39.92	62
5.1.3 Technicians and associate professionals.....	20.11	90
5.1.4 Labour productivity per employee.....	13.29	79
5.2 Employability.....	46.81	73
5.2.1 Ease of finding skilled employees.....	52.95	72
5.2.2 Relevance of education system to the economy.....	35.64	89
5.2.3 Skills matching with secondary education.....	42.33	68
5.2.4 Skills matching with tertiary education.....	56.32	60

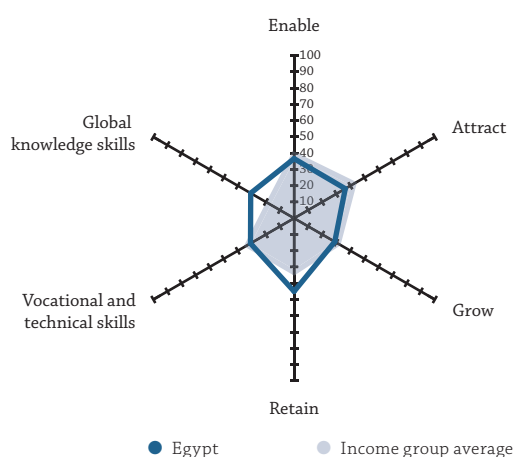
6 GLOBAL KNOWLEDGE SKILLS.....	17.01	93
6.1 High-Level Skills.....	17.70	99
6.1.1 Workforce with tertiary education.....	23.04	80
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	18.82	84
6.1.4 Researchers.....	4.73	71
6.1.5 Senior officials and managers.....	5.63	110
6.1.6 Availability of scientists and engineers.....	36.29	100
6.2 Talent Impact.....	16.31	83
6.2.1 Innovation output.....	19.79	94
6.2.2 High-value exports.....	13.85	77
6.2.3 New product entrepreneurial activity.....	29.01	66
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	2.59	80

EGYPT

Key Indicators

Rank (out of 132).....	97
Income group.....	Lower-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	98.42

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	36.66	105
1.1 Regulatory Landscape.....	32.19	113
1.1.1 Government effectiveness.....	31.53	105
1.1.2 Rule of law.....	40.17	99
1.1.3 Political stability.....	33.94	123
1.1.4 Regulatory quality.....	26.93	119
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	44.08	81
1.2.1 Competition intensity.....	64.09	77
1.2.2 Ease of doing business.....	49.93	100
1.2.3 Cluster development.....	56.04	37
1.2.4 R&D expenditure.....	12.96	52
1.2.5 ICT infrastructure.....	47.33	76
1.2.6 Urban population.....	34.12	104
1.3 Business and Labour Landscape.....	33.72	109
Labour Market		
1.3.1 Tertiary-educated unemployment.....	31.45	122
1.3.2 Active labour market policies.....	26.86	100
1.3.3 Labour-employer cooperation.....	37.52	70
Management Practice		
1.3.4 Professional management.....	44.38	81
1.3.5 Relationship of pay to productivity.....	46.16	72
Technology Adoption		
1.3.6 Technology utilisation.....	46.09	78
1.3.7 Investment in emerging technologies.....	37.05	71
1.3.8 Robot density.....	0.22	59
2 ATTRACT.....	36.36	116
2.1 External Openness.....	30.28	108
Attract Business		
2.1.1 FDI and technology transfer.....	57.05	65
2.1.2 Prevalence of foreign ownership.....	41.73	108
Attract People		
2.1.3 Migrant stock.....	10.99	116
2.1.4 International students.....	6.64	72
2.1.5 Brain gain.....	34.97	92
2.2 Internal Openness.....	42.44	116
Social Inclusion		
2.2.1 Tolerance of minorities.....	12.22	120
2.2.2 Tolerance of immigrants.....	31.51	107
2.2.3 Social mobility.....	50.05	88
Gender Equality		
2.2.4 Female graduates.....	64.29	76
2.2.5 Gender development gap.....	43.31	115
2.2.6 Leadership opportunities for women.....	53.29	52

GDP per capita (PPP US\$).....	12,390.42
GDP (US\$ billions).....	250.90
GTCI score.....	34.79
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	28.89	104
3.1 Formal Education.....	25.94	67
Enrolment		
3.1.1 Vocational enrolment.....	33.66	31
3.1.2 Tertiary enrolment.....	26.80	75
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	17.37	55
3.2 Lifelong Learning.....	20.28	127
3.2.1 Quality of management schools.....	23.88	123
3.2.2 Prevalence of training in firms.....	8.71	94
3.2.3 Employee development.....	28.26	101
3.3 Access to Growth Opportunities.....	40.45	96
Empowerment		
3.3.1 Delegation of authority.....	34.32	98
3.3.2 Personal rights.....	26.56	117
Collaboration		
3.3.3 Use of virtual social networks.....	85.28	31
3.3.4 Use of virtual professional networks.....	8.50	67
3.3.5 Collaboration within organisations.....	40.91	94
3.3.6 Collaboration across organisations.....	47.13	45

4 RETAIN.....	45.02	74
4.1 Sustainability.....	42.17	67
4.1.1 Pension system.....	53.60	49
4.1.2 Social protection.....	42.06	68
4.1.3 Brain retention.....	30.86	95
4.2 Lifestyle.....	47.87	86
4.2.1 Environmental performance.....	56.31	59
4.2.2 Personal safety.....	29.77	110
4.2.3 Physician density.....	12.75	90
4.2.4 Sanitation.....	92.65	61

5 VOCATIONAL AND TECHNICAL SKILLS.....	30.97	104
5.1 Mid-Level Skills.....	37.13	71
5.1.1 Workforce with secondary education.....	52.69	52
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	30.97	71
5.1.4 Labour productivity per employee.....	27.74	56
5.2 Employability.....	24.80	128
5.2.1 Ease of finding skilled employees.....	41.93	104
5.2.2 Relevance of education system to the economy.....	19.98	123
5.2.3 Skills matching with secondary education.....	12.77	129
5.2.4 Skills matching with tertiary education.....	24.54	127

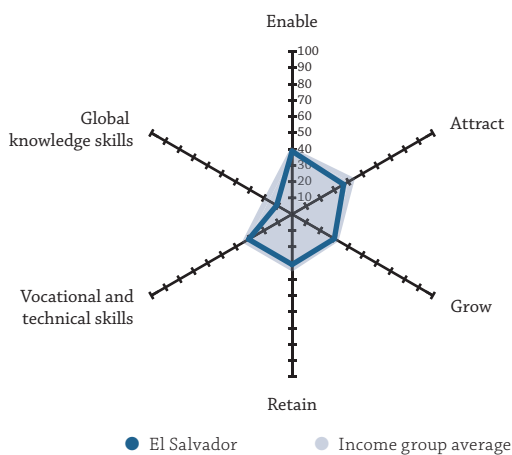
6 GLOBAL KNOWLEDGE SKILLS.....	30.83	52
6.1 High-Level Skills.....	39.77	43
6.1.1 Workforce with tertiary education.....	28.47	66
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	29.07	60
6.1.4 Researchers.....	8.00	60
6.1.5 Senior officials and managers.....	73.10	6
6.1.6 Availability of scientists and engineers.....	60.21	44
6.2 Talent Impact.....	21.88	67
6.2.1 Innovation output.....	26.62	73
6.2.2 High-value exports.....	2.57	114
6.2.3 New product entrepreneurial activity.....	53.83	39
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	4.50	72

EL SALVADOR

Key Indicators

Rank (out of 132).....	110
Income group.....	Lower-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	6.42

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	38.79	98
1.1 Regulatory Landscape.....	40.53	93
1.1.1 Government effectiveness.....	37.68	94
1.1.2 Rule of law.....	32.68	113
1.1.3 Political stability.....	59.59	76
1.1.4 Regulatory quality.....	44.34	82
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	43.70	82
1.2.1 Competition intensity.....	75.89	39
1.2.2 Ease of doing business.....	62.17	79
1.2.3 Cluster development.....	14.37	127
1.2.4 R&D expenditure.....	2.89	96
1.2.5 ICT infrastructure.....	39.06	88
1.2.6 Urban population.....	67.83	49
1.3 Business and Labour Landscape.....	32.13	114
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	83.65	52
1.3.2 Active labour market policies.....	2.07	131
1.3.3 Labour-employer cooperation.....	26.70	99
1.3.4 Management Practice		
1.3.4 Professional management.....	31.50	108
1.3.5 Relationship of pay to productivity.....	26.20	123
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	35.90	108
1.3.7 Investment in emerging technologies.....	18.90	121
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	36.64	115
2.1 External Openness.....	24.78	123
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	36.83	117
2.1.2 Prevalence of foreign ownership.....	52.26	86
2.1.3 Attract People		
2.1.3 Migrant stock.....	13.47	109
2.1.4 International students.....	1.34	97
2.1.5 Brain gain.....	20.03	117
2.2 Internal Openness.....	48.49	100
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	43.33	69
2.2.2 Tolerance of immigrants.....	64.38	55
2.2.3 Social mobility.....	25.35	129
2.2.4 Gender Equality		
2.2.4 Female graduates.....	69.40	71
2.2.5 Gender development gap.....	77.73	65
2.2.6 Leadership opportunities for women.....	10.75	130

GDP per capita (PPP US\$).....	8,316.99
GDP (US\$ billions).....	26.06
GTCI score.....	29.71
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	30.04	98
3.1 Formal Education.....	13.82	95
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	27.23	45
3.1.2 Tertiary enrolment.....	22.23	82
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	5.85	108
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	41.08	72
3.2.1 Quality of management schools.....	31.72	110
3.2.2 Prevalence of training in firms.....	66.49	16
3.2.3 Employee development.....	25.01	111
3.3 Access to Growth Opportunities.....	35.21	110
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	32.15	108
3.3.2 Personal rights.....	70.36	74
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	66.06	91
3.3.4 Use of virtual professional networks.....	7.26	71
3.3.5 Collaboration within organisations.....	21.84	129
3.3.6 Collaboration across organisations.....	13.56	131

4 RETAIN.....	30.96	105
4.1 Sustainability.....	20.44	118
4.1.1 Pension system.....	29.31	72
4.1.2 Social protection.....	16.37	122
4.1.3 Brain retention.....	15.64	124
4.2 Lifestyle.....	41.49	95
4.2.1 Environmental performance.....	44.14	87
4.2.2 Personal safety.....	6.08	128
4.2.3 Physician density.....	25.29	70
4.2.4 Sanitation.....	90.45	69

5 VOCATIONAL AND TECHNICAL SKILLS.....	30.87	105
5.1 Mid-Level Skills.....	30.66	82
5.1.1 Workforce with secondary education.....	44.67	66
5.1.2 Population with secondary education.....	29.67	74
5.1.3 Technicians and associate professionals.....	17.64	97
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	31.08	120
5.2.1 Ease of finding skilled employees.....	41.63	105
5.2.2 Relevance of education system to the economy.....	11.81	130
5.2.3 Skills matching with secondary education.....	31.68	96
5.2.4 Skills matching with tertiary education.....	39.18	107

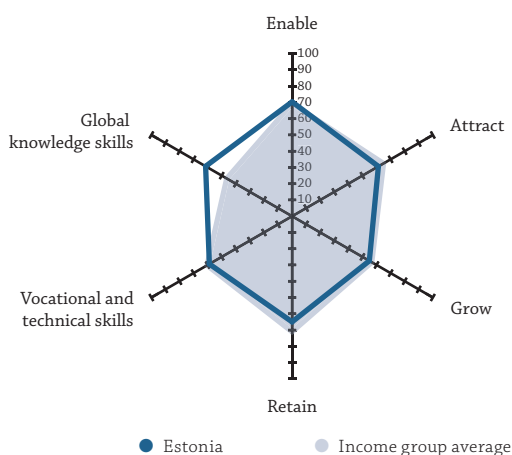
6 GLOBAL KNOWLEDGE SKILLS.....	10.96	114
6.1 High-Level Skills.....	10.61	120
6.1.1 Workforce with tertiary education.....	10.89	104
6.1.2 Population with tertiary education.....	11.27	91
6.1.3 Professionals.....	17.35	89
6.1.4 Researchers.....	0.67	90
6.1.5 Senior officials and managers.....	8.96	98
6.1.6 Availability of scientists and engineers.....	14.50	131
6.2 Talent Impact.....	11.32	103
6.2.1 Innovation output.....	13.66	113
6.2.2 High-value exports.....	15.00	71
6.2.3 New product entrepreneurial activity.....	25.30	72
6.2.4 New business density.....	2.52	85
6.2.5 Scientific journal articles.....	0.14	123

ESTONIA

Key Indicators

Rank (out of 132).....	24
Income group.....	High income
Regional group.....	Europe
Population (millions).....	1.32

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	70.38	24
1.1 Regulatory Landscape.....	80.77	19
1.1.1 Government effectiveness.....	73.60	26
1.1.2 Rule of law.....	82.60	21
1.1.3 Political stability.....	79.52	32
1.1.4 Regulatory quality.....	88.39	13
1.1.5 Corruption.....	79.73	17
1.2 Market Landscape.....	65.61	28
1.2.1 Competition intensity.....	87.54	9
1.2.2 Ease of doing business.....	89.12	14
1.2.3 Cluster development.....	41.67	71
1.2.4 R&D expenditure.....	28.68	27
1.2.5 ICT infrastructure.....	82.44	18
1.2.6 Urban population.....	64.22	56
1.3 Business and Labour Landscape.....	64.75	27
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.36	33
1.3.2 Active labour market policies.....	79.65	13
1.3.3 Labour-employer cooperation.....	64.67	23
1.3.4 Management Practice		
1.3.4 Professional management.....	74.37	26
1.3.5 Relationship of pay to productivity.....	69.81	20
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	76.64	23
1.3.7 Investment in emerging technologies.....	58.91	34
1.3.8 Robot density.....	5.63	39
2 ATTRACT.....	61.32	31
2.1 External Openness.....	58.26	26
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	67.67	42
2.1.2 Prevalence of foreign ownership.....	86.50	8
2.1.3 Attract People		
2.1.3 Migrant stock.....	65.75	21
2.1.4 International students.....	24.91	30
2.1.5 Brain gain.....	46.46	58
2.2 Internal Openness.....	64.38	43
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	26.67	97
2.2.2 Tolerance of immigrants.....	15.07	121
2.2.3 Social mobility.....	85.64	14
2.2.4 Gender Equality		
2.2.4 Female graduates.....	90.64	15
2.2.5 Gender development gap.....	95.64	6
2.2.6 Leadership opportunities for women.....	72.63	22

GDP per capita (PPP US\$).....	35,747.41
GDP (US\$ billions).....	30.28
GTCI score.....	61.97
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	54.88	28
3.1 Formal Education.....	46.34	25
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	33.08	34
3.1.2 Tertiary enrolment.....	56.22	24
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	33.19	25
3.1.4 Reading, maths, and science.....	87.14	3
3.1.5 University ranking.....	22.08	47
3.2 Lifelong Learning.....	56.14	34
3.2.1 Quality of management schools.....	66.02	31
3.2.2 Prevalence of training in firms.....	41.95	40
3.2.3 Employee development.....	60.46	29
3.3 Access to Growth Opportunities.....	62.15	27
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	66.55	27
3.3.2 Personal rights.....	97.29	10
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	85.93	26
3.3.4 Use of virtual professional networks.....	15.39	45
3.3.5 Collaboration within organisations.....	62.78	30
3.3.6 Collaboration across organisations.....	44.95	48

4 RETAIN.....	65.00	31
4.1 Sustainability.....	58.77	38
4.1.1 Pension system.....	82.30	26
4.1.2 Social protection.....	52.28	45
4.1.3 Brain retention.....	41.74	62
4.2 Lifestyle.....	71.23	33
4.2.1 Environmental performance.....	61.48	43
4.2.2 Personal safety.....	69.16	37
4.2.3 Physician density.....	54.70	24
4.2.4 Sanitation.....	99.58	18

5 VOCATIONAL AND TECHNICAL SKILLS.....	58.78	29
5.1 Mid-Level Skills.....	58.60	27
5.1.1 Workforce with secondary education.....	65.56	30
5.1.2 Population with secondary education.....	68.97	23
5.1.3 Technicians and associate professionals.....	59.68	26
5.1.4 Labour productivity per employee.....	40.20	40
5.2 Employability.....	58.96	42
5.2.1 Ease of finding skilled employees.....	40.05	107
5.2.2 Relevance of education system to the economy.....	62.53	31
5.2.3 Skills matching with secondary education.....	63.49	28
5.2.4 Skills matching with tertiary education.....	69.79	32

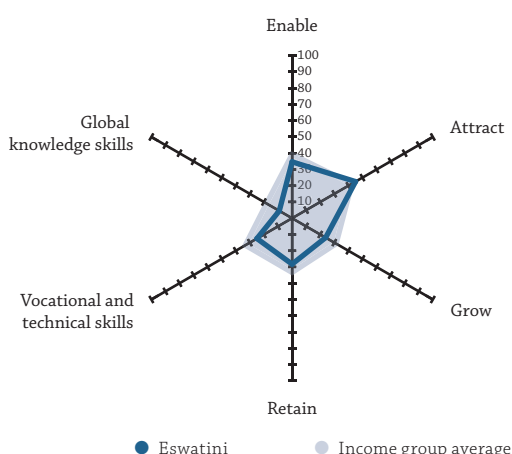
6 GLOBAL KNOWLEDGE SKILLS.....	61.45	10
6.1 High-Level Skills.....	59.51	14
6.1.1 Workforce with tertiary education.....	61.12	18
6.1.2 Population with tertiary education.....	60.33	11
6.1.3 Professionals.....	54.57	18
6.1.4 Researchers.....	43.18	26
6.1.5 Senior officials and managers.....	77.36	5
6.1.6 Availability of scientists and engineers.....	60.51	43
6.2 Talent Impact.....	63.39	5
6.2.1 Innovation output.....	65.50	18
6.2.2 High-value exports.....	46.95	19
6.2.3 New product entrepreneurial activity.....	59.89	23
6.2.4 New business density.....	100.00	1
6.2.5 Scientific journal articles.....	44.61	26

ESWATINI

Key Indicators

Rank (out of 132).....	115
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	1.14

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	34.70	109
1.1 Regulatory Landscape.....	40.72	92
1.1.1 Government effectiveness.....	32.55	100
1.1.2 Rule of law.....	45.90	81
1.1.3 Political stability.....	58.43	84
1.1.4 Regulatory quality.....	34.31	106
1.1.5 Corruption.....	32.43	73
1.2 Market Landscape.....	28.81	121
1.2.1 Competition intensity.....	48.04	119
1.2.2 Ease of doing business.....	50.63	98
1.2.3 Cluster development.....	27.41	102
1.2.4 R&D expenditure.....	5.60	83
1.2.5 ICT infrastructure.....	n/a	n/a
1.2.6 Urban population.....	12.38	124
1.3 Business and Labour Landscape.....	34.58	106
Labour Market		
1.3.1 Tertiary-educated unemployment.....	62.59	98
1.3.2 Active labour market policies.....	20.18	109
1.3.3 Labour-employer cooperation.....	23.47	105
Management Practice		
1.3.4 Professional management.....	56.15	50
1.3.5 Relationship of pay to productivity.....	44.44	77
Technology Adoption		
1.3.6 Technology utilisation.....	23.43	122
1.3.7 Investment in emerging technologies.....	11.76	128
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	45.09	88
2.1 External Openness.....	35.97	90
Attract Business		
2.1.1 FDI and technology transfer.....	33.23	122
2.1.2 Prevalence of foreign ownership.....	70.48	40
Attract People		
2.1.3 Migrant stock.....	36.14	71
2.1.4 International students.....	1.77	90
2.1.5 Brain gain.....	38.25	86
2.2 Internal Openness.....	54.21	75
Social Inclusion		
2.2.1 Tolerance of minorities.....	80.00	11
2.2.2 Tolerance of immigrants.....	67.12	46
2.2.3 Social mobility.....	50.37	86
Gender Equality		
2.2.4 Female graduates.....	26.55	106
2.2.5 Gender development gap.....	68.44	88
2.2.6 Leadership opportunities for women.....	32.79	99

GDP per capita (PPP US\$).....	10,721.64
GDP (US\$ billions).....	4.70
GTCI score.....	27.66
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	23.84	123
3.1 Formal Education.....	7.74	119
Enrolment		
3.1.1 Vocational enrolment.....	5.98	94
3.1.2 Tertiary enrolment.....	3.67	120
Quality		
3.1.3 Tertiary education expenditure.....	21.30	63
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	35.01	95
3.2.1 Quality of management schools.....	20.73	125
3.2.2 Prevalence of training in firms.....	43.14	37
3.2.3 Employee development.....	41.16	60
3.3 Access to Growth Opportunities.....	28.79	124
Empowerment		
3.3.1 Delegation of authority.....	52.67	48
3.3.2 Personal rights.....	24.16	120
Collaboration		
3.3.3 Use of virtual social networks.....	34.83	126
3.3.4 Use of virtual professional networks.....	4.76	83
3.3.5 Collaboration within organisations.....	33.82	107
3.3.6 Collaboration across organisations.....	22.48	115

4 RETAIN.....	28.24	110
4.1 Sustainability.....	28.95	101
4.1.1 Pension system.....	25.50	75
4.1.2 Social protection.....	29.51	99
4.1.3 Brain retention.....	31.82	93
4.2 Lifestyle.....	27.53	109
4.2.1 Environmental performance.....	21.49	122
4.2.2 Personal safety.....	31.76	106
4.2.3 Physician density.....	2.05	107
4.2.4 Sanitation.....	54.83	104

5 VOCATIONAL AND TECHNICAL SKILLS.....	24.98	121
5.1 Mid-Level Skills.....	8.48	121
5.1.1 Workforce with secondary education.....	0.00	127
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	16.96	99
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	41.48	89
5.2.1 Ease of finding skilled employees.....	51.21	80
5.2.2 Relevance of education system to the economy.....	39.79	79
5.2.3 Skills matching with secondary education.....	32.90	91
5.2.4 Skills matching with tertiary education.....	42.02	102

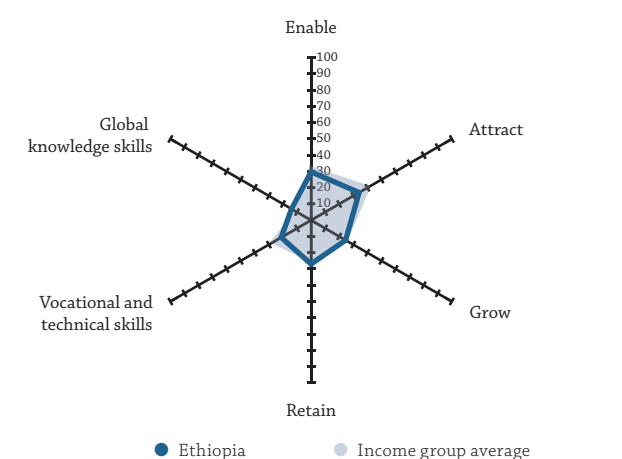
6 GLOBAL KNOWLEDGE SKILLS.....	9.08	123
6.1 High-Level Skills.....	17.20	103
6.1.1 Workforce with tertiary education.....	21.84	81
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	30.84	57
6.1.4 Researchers.....	1.32	86
6.1.5 Senior officials and managers.....	10.64	94
6.1.6 Availability of scientists and engineers.....	21.35	127
6.2 Talent Impact.....	0.96	127
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	0.85	121
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	1.06	95

ETHIOPIA

Key Indicators

Rank (out of 132).....	123
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	109.22

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....29.76 125		
1.1 Regulatory Landscape.....30.01 118		
1.1.1 Government effectiveness.....29.59 113		
1.1.2 Rule of law.....42.07 97		
1.1.3 Political stability.....27.97 124		
1.1.4 Regulatory quality.....23.39 124		
1.1.5 Corruption.....27.03 95		
1.2 Market Landscape.....21.71 128		
1.2.1 Competition intensity.....30.29 130		
1.2.2 Ease of doing business.....32.96 123		
1.2.3 Cluster development.....36.68 83		
1.2.4 R&D expenditure.....12.94 53		
1.2.5 ICT infrastructure.....8.52 124		
1.2.6 Urban population.....8.89 127		
1.3 Business and Labour Landscape.....37.57 97		
Labour Market		
1.3.1 Tertiary-educated unemployment.....82.00 60		
1.3.2 Active labour market policies.....43.80 64		
1.3.3 Labour-employer cooperation.....17.75 115		
Management Practice		
1.3.4 Professional management.....32.07 107		
1.3.5 Relationship of pay to productivity.....45.30 76		
Technology Adoption		
1.3.6 Technology utilisation.....13.80 126		
1.3.7 Investment in emerging technologies.....28.27 100		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....34.11 122		
2.1 External Openness.....35.56 91		
Attract Business		
2.1.1 FDI and technology transfer.....39.09 112		
2.1.2 Prevalence of foreign ownership.....37.60 115		
Attract People		
2.1.3 Migrant stock.....18.77 102		
2.1.4 International students.....n/a n/a		
2.1.5 Brain gain.....46.80 55		
2.2 Internal Openness.....32.65 128		
Social Inclusion		
2.2.1 Tolerance of minorities.....16.67 111		
2.2.2 Tolerance of immigrants.....56.16 74		
2.2.3 Social mobility.....50.54 84		
Gender Equality		
2.2.4 Female graduates.....13.22 111		
2.2.5 Gender development gap.....34.21 124		
2.2.6 Leadership opportunities for women.....25.08 114		

GDP per capita (PPP US\$).....	2,018.57
GDP (US\$ billions).....	84.36
GTCI score.....	25.08
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....24.53 119		
3.1 Formal Education.....17.98 81		
Enrolment		
3.1.1 Vocational enrolment.....10.78 84		
3.1.2 Tertiary enrolment.....5.85 113		
Quality		
3.1.3 Tertiary education expenditure.....55.30 3		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....29.82 112		
3.2.1 Quality of management schools.....37.50 95		
3.2.2 Prevalence of training in firms.....22.96 77		
3.2.3 Employee development.....29.00 97		
3.3 Access to Growth Opportunities.....25.80 127		
Empowerment		
3.3.1 Delegation of authority.....19.50 124		
3.3.2 Personal rights.....38.34 110		
Collaboration		
3.3.3 Use of virtual social networks.....21.40 130		
3.3.4 Use of virtual professional networks.....0.00 126		
3.3.5 Collaboration within organisations.....35.35 102		
3.3.6 Collaboration across organisations.....40.21 62		

4 RETAIN.....26.94 114		
4.1 Sustainability.....37.32 76		
4.1.1 Pension system.....n/a n/a		
4.1.2 Social protection.....34.79 82		
4.1.3 Brain retention.....39.84 68		
4.2 Lifestyle.....16.57 130		
4.2.1 Environmental performance.....28.92 109		
4.2.2 Personal safety.....37.33 96		
4.2.3 Physician density.....0.05 125		
4.2.4 Sanitation.....0.00 132		

5 VOCATIONAL AND TECHNICAL SKILLS.....21.22 128		
5.1 Mid-Level Skills.....5.54 127		
5.1.1 Workforce with secondary education.....7.11 119		
5.1.2 Population with secondary education.....9.72 104		
5.1.3 Technicians and associate professionals.....4.71 122		
5.1.4 Labour productivity per employee.....0.63 109		
5.2 Employability.....36.90 101		
5.2.1 Ease of finding skilled employees.....43.80 98		
5.2.2 Relevance of education system to the economy.....41.06 74		
5.2.3 Skills matching with secondary education.....20.49 124		
5.2.4 Skills matching with tertiary education.....42.25 100		

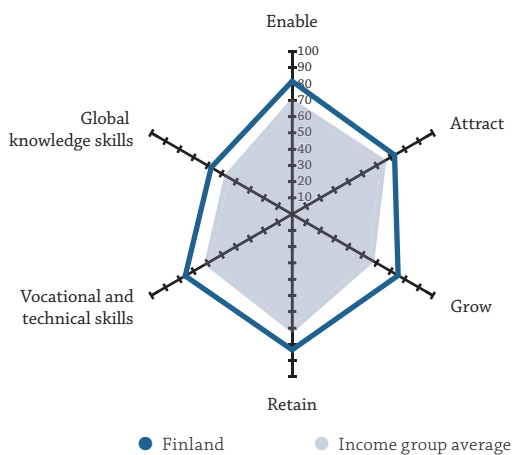
6 GLOBAL KNOWLEDGE SKILLS.....13.91 106		
6.1 High-Level Skills.....8.13 128		
6.1.1 Workforce with tertiary education.....0.84 124		
6.1.2 Population with tertiary education.....0.00 110		
6.1.3 Professionals.....5.83 118		
6.1.4 Researchers.....0.42 95		
6.1.5 Senior officials and managers.....2.11 123		
6.1.6 Availability of scientists and engineers.....39.57 90		
6.2 Talent Impact.....19.69 71		
6.2.1 Innovation output.....23.99 79		
6.2.2 High-value exports.....51.35 17		
6.2.3 New product entrepreneurial activity.....22.63 78		
6.2.4 New business density.....0.10 106		
6.2.5 Scientific journal articles.....0.39 113		

FINLAND

Key Indicators

Rank (out of 132).....	7
Income group	High income
Regional group	Europe
Population (millions)	5.52

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....81.83	10	
1.1 Regulatory Landscape.....	94.14	5
1.1.1 Government effectiveness.....	93.49	4
1.1.2 Rule of law.....	100.00	1
1.1.3 Political stability.....	88.49	13
1.1.4 Regulatory quality.....	92.76	7
1.1.5 Corruption.....	95.95	3
1.2 Market Landscape.....	72.78	19
1.2.1 Competition intensity.....	57.38	98
1.2.2 Ease of doing business.....	88.85	15
1.2.3 Cluster development.....	74.89	16
1.2.4 R&D expenditure.....	60.23	10
1.2.5 ICT infrastructure.....	72.14	39
1.2.6 Urban population.....	83.19	23
1.3 Business and Labour Landscape.....	78.58	10
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	86.32	46
1.3.2 Active labour market policies.....	80.91	12
1.3.3 Labour-employer cooperation.....	69.44	15
1.3.4 Management Practice		
1.3.4 Professional management.....	100.00	1
1.3.5 Relationship of pay to productivity.....	68.82	24
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	93.73	6
1.3.7 Investment in emerging technologies.....	87.87	6
1.3.8 Robot density.....	41.52	18
2 ATTRACT.....72.79	13	
2.1 External Openness.....	53.91	32
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	72.05	32
2.1.2 Prevalence of foreign ownership.....	74.58	33
2.1.3 Attract People		
2.1.3 Migrant stock.....	45.24	55
2.1.4 International students.....	28.60	26
2.1.5 Brain gain.....	49.07	50
2.2 Internal Openness.....	91.67	2
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	97.78	3
2.2.2 Tolerance of immigrants.....	84.93	16
2.2.3 Social mobility.....	99.50	2
2.2.4 Gender Equality		
2.2.4 Female graduates.....	78.78	39
2.2.5 Gender development gap.....	89.01	18
2.2.6 Leadership opportunities for women.....	100.00	1

GDP per capita (PPP US\$)	48,635.85
GDP (US\$ billions)	275.68
GTCI score.....	74.47
GTCI score (income group average)	61.46

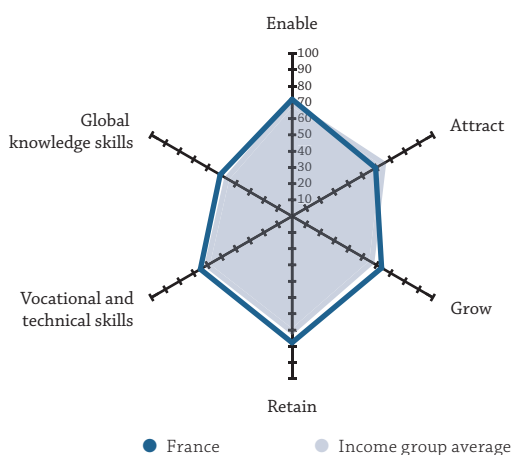
	Score	Rank
3 GROW.....75.34	4	
3.1 Formal Education.....	64.80	3
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	74.05	2
3.1.2 Tertiary enrolment.....	68.64	10
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	45.65	8
3.1.4 Reading, maths, and science.....	86.41	5
3.1.5 University ranking.....	49.26	18
3.2 Lifelong Learning.....	81.09	6
3.2.1 Quality of management schools.....	81.53	8
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	80.65	9
3.3 Access to Growth Opportunities.....	80.13	7
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	90.39	6
3.3.2 Personal rights.....	98.66	3
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	92.91	9
3.3.4 Use of virtual professional networks.....	31.52	21
3.3.5 Collaboration within organisations.....	86.27	8
3.3.6 Collaboration across organisations.....	81.02	7
4 RETAIN.....83.43	8	
4.1 Sustainability.....	86.93	7
4.1.1 Pension system.....	84.89	23
4.1.2 Social protection.....	98.11	7
4.1.3 Brain retention.....	77.79	13
4.2 Lifestyle.....	79.93	15
4.2.1 Environmental performance.....	85.36	10
4.2.2 Personal safety.....	84.01	19
4.2.3 Physician density.....	50.95	32
4.2.4 Sanitation.....	99.41	22
5 VOCATIONAL AND TECHNICAL SKILLS.....75.91	4	
5.1 Mid-Level Skills.....	64.51	14
5.1.1 Workforce with secondary education.....	61.60	35
5.1.2 Population with secondary education.....	55.47	35
5.1.3 Technicians and associate professionals.....	84.06	6
5.1.4 Labour productivity per employee.....	56.91	18
5.2 Employability.....	87.32	3
5.2.1 Ease of finding skilled employees.....	88.79	3
5.2.2 Relevance of education system to the economy.....	90.22	4
5.2.3 Skills matching with secondary education.....	86.52	3
5.2.4 Skills matching with tertiary education.....	83.74	10
6 GLOBAL KNOWLEDGE SKILLS.....57.49	15	
6.1 High-Level Skills.....	64.17	10
6.1.1 Workforce with tertiary education.....	64.89	14
6.1.2 Population with tertiary education.....	54.66	19
6.1.3 Professionals.....	66.35	10
6.1.4 Researchers.....	81.27	6
6.1.5 Senior officials and managers.....	19.21	70
6.1.6 Availability of scientists and engineers.....	98.64	2
6.2 Talent Impact.....	50.81	19
6.2.1 Innovation output.....	79.16	7
6.2.2 High-value exports.....	21.79	56
6.2.3 New product entrepreneurial activity.....	58.08	28
6.2.4 New business density.....	18.98	31
6.2.5 Scientific journal articles.....	76.04	8

FRANCE

Key Indicators

Rank (out of 132).....	21
Income group.....	High income
Regional group.....	Europe
Population (millions).....	66.99

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....71.93	23	
1.1 Regulatory Landscape.....	78.02	21
1.1.1 Government effectiveness.....	79.32	20
1.1.2 Rule of law.....	86.25	18
1.1.3 Political stability.....	69.66	55
1.1.4 Regulatory quality.....	76.48	25
1.1.5 Corruption.....	78.38	20
1.2 Market Landscape.....	76.18	13
1.2.1 Competition intensity.....	88.01	7
1.2.2 Ease of doing business.....	83.39	30
1.2.3 Cluster development.....	71.94	19
1.2.4 R&D expenditure.....	47.66	13
1.2.5 ICT infrastructure.....	88.55	10
1.2.6 Urban population.....	77.51	33
1.3 Business and Labour Landscape.....	61.59	30
Labour Market		
1.3.1 Tertiary-educated unemployment.....	82.19	59
1.3.2 Active labour market policies.....	69.14	30
1.3.3 Labour-employer cooperation.....	28.35	94
Management Practice		
1.3.4 Professional management.....	77.38	23
1.3.5 Relationship of pay to productivity.....	49.01	65
Technology Adoption		
1.3.6 Technology utilisation.....	73.86	27
1.3.7 Investment in emerging technologies.....	67.30	21
1.3.8 Robot density.....	45.52	16
2 ATTRACT.....59.36	36	
2.1 External Openness.....	59.89	25
Attract Business		
2.1.1 FDI and technology transfer.....	71.67	33
2.1.2 Prevalence of foreign ownership.....	80.55	19
Attract People		
2.1.3 Migrant stock.....	61.13	30
2.1.4 International students.....	36.27	19
2.1.5 Brain gain.....	49.86	46
2.2 Internal Openness.....	58.82	58
Social Inclusion		
2.2.1 Tolerance of minorities.....	33.33	85
2.2.2 Tolerance of immigrants.....	67.12	46
2.2.3 Social mobility.....	69.61	31
Gender Equality		
2.2.4 Female graduates.....	70.58	67
2.2.5 Gender development gap.....	84.34	36
2.2.6 Leadership opportunities for women.....	27.93	108

GDP per capita (PPP US\$).....	45,877.08
GDP (US\$ billions).....	2,777.54
GTCI score.....	64.83
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....63.61	17	
3.1 Formal Education.....	50.33	18
Enrolment		
3.1.1 Vocational enrolment.....	27.72	44
3.1.2 Tertiary enrolment.....	50.69	36
Quality		
3.1.3 Tertiary education expenditure.....	28.92	37
3.1.4 Reading, maths, and science.....	73.71	23
3.1.5 University ranking.....	70.59	10
3.2 Lifelong Learning.....	74.03	16
3.2.1 Quality of management schools.....	80.73	9
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	67.34	23
3.3 Access to Growth Opportunities.....	66.46	21
Empowerment		
3.3.1 Delegation of authority.....	61.19	34
3.3.2 Personal rights.....	94.66	24
Collaboration		
3.3.3 Use of virtual social networks.....	82.89	39
3.3.4 Use of virtual professional networks.....	45.84	13
3.3.5 Collaboration within organisations.....	66.88	26
3.3.6 Collaboration across organisations.....	47.32	43

4 RETAIN.....77.78	19	
4.1 Sustainability.....	76.10	21
4.1.1 Pension system.....	88.56	17
4.1.2 Social protection.....	98.51	6
4.1.3 Brain retention.....	41.24	65
4.2 Lifestyle.....	79.46	16
4.2.1 Environmental performance.....	94.22	2
4.2.2 Personal safety.....	73.45	29
4.2.3 Physician density.....	51.62	29
4.2.4 Sanitation.....	98.55	35

5 VOCATIONAL AND TECHNICAL SKILLS.....65.16	17	
5.1 Mid-Level Skills.....	65.72	11
5.1.1 Workforce with secondary education.....	58.64	40
5.1.2 Population with secondary education.....	56.04	34
5.1.3 Technicians and associate professionals.....	87.12	5
5.1.4 Labour productivity per employee.....	61.07	13
5.2 Employability.....	64.60	31
5.2.1 Ease of finding skilled employees.....	73.97	24
5.2.2 Relevance of education system to the economy.....	55.45	44
5.2.3 Skills matching with secondary education.....	58.51	33
5.2.4 Skills matching with tertiary education.....	70.48	31

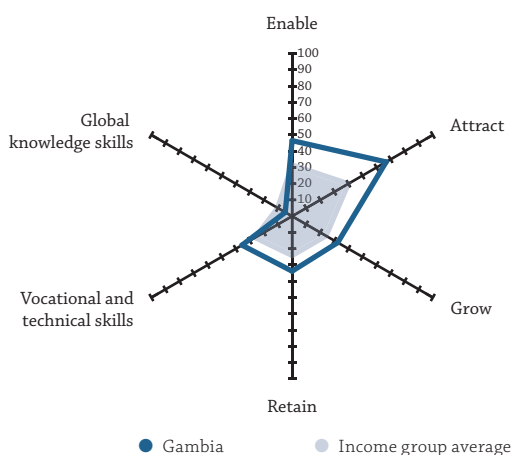
6 GLOBAL KNOWLEDGE SKILLS.....51.12	22	
6.1 High-Level Skills.....	53.69	23
6.1.1 Workforce with tertiary education.....	60.00	20
6.1.2 Population with tertiary education.....	46.71	31
6.1.3 Professionals.....	48.21	28
6.1.4 Researchers.....	53.77	18
6.1.5 Senior officials and managers.....	44.15	28
6.1.6 Availability of scientists and engineers.....	69.32	25
6.2 Talent Impact.....	48.54	22
6.2.1 Innovation output.....	67.60	14
6.2.2 High-value exports.....	70.11	8
6.2.3 New product entrepreneurial activity.....	55.08	36
6.2.4 New business density.....	8.80	51
6.2.5 Scientific journal articles.....	41.13	27

GAMBIA

Key Indicators

Rank (out of 132).....	85
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	2.28

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 46.52 75		
1.1 Regulatory Landscape.....	40.33	94
1.1.1 Government effectiveness.....	30.84	110
1.1.2 Rule of law.....	42.18	96
1.1.3 Political stability.....	60.44	74
1.1.4 Regulatory quality.....	37.09	102
1.1.5 Corruption.....	31.08	77
1.2 Market Landscape.....	40.34	96
1.2.1 Competition intensity.....	78.79	28
1.2.2 Ease of doing business.....	37.71	117
1.2.3 Cluster development.....	40.89	74
1.2.4 R&D expenditure.....	2.60	99
1.2.5 ICT infrastructure.....	26.59	104
1.2.6 Urban population.....	55.47	72
1.3 Business and Labour Landscape.....	58.90	33
Labour Market		
1.3.1 Tertiary-educated unemployment.....	100.00	1
1.3.2 Active labour market policies.....	42.85	65
1.3.3 Labour-employer cooperation.....	52.38	36
Management Practice		
1.3.4 Professional management.....	66.14	32
1.3.5 Relationship of pay to productivity.....	63.06	40
Technology Adoption		
1.3.6 Technology utilisation.....	51.64	66
1.3.7 Investment in emerging technologies.....	36.20	73
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT..... 66.81 23		
2.1 External Openness.....	68.39	14
Attract Business		
2.1.1 FDI and technology transfer.....	62.34	54
2.1.2 Prevalence of foreign ownership.....	81.36	15
Attract People		
2.1.3 Migrant stock.....	64.49	24
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	65.36	25
2.2 Internal Openness.....	65.22	39
Social Inclusion		
2.2.1 Tolerance of minorities.....	75.56	17
2.2.2 Tolerance of immigrants.....	87.67	12
2.2.3 Social mobility.....	57.19	67
Gender Equality		
2.2.4 Female graduates.....	48.51	97
2.2.5 Gender development gap.....	49.79	112
2.2.6 Leadership opportunities for women.....	72.61	23

GDP per capita (PPP US\$).....	1,706.27
GDP (US\$ billions).....	1.62
GTGI score.....	36.66
GTGI score (income group average).....	26.01

	Score	Rank
3 GROW..... 32.42 88		
3.1 Formal Education.....	6.45	120
Enrolment		
3.1.1 Vocational enrolment.....	14.82	70
3.1.2 Tertiary enrolment.....	1.85	125
Quality		
3.1.3 Tertiary education expenditure.....	9.15	99
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	38.24	83
3.2.1 Quality of management schools.....	49.84	57
3.2.2 Prevalence of training in firms.....	28.76	64
3.2.3 Employee development.....	36.11	71
3.3 Access to Growth Opportunities.....	52.57	44
Empowerment		
3.3.1 Delegation of authority.....	74.93	21
3.3.2 Personal rights.....	78.85	57
Collaboration		
3.3.3 Use of virtual social networks.....	77.00	57
3.3.4 Use of virtual professional networks.....	2.56	98
3.3.5 Collaboration within organisations.....	52.13	49
3.3.6 Collaboration across organisations.....	29.95	91

4 RETAIN..... 33.79 99		
4.1 Sustainability.....	39.13	71
4.1.1 Pension system.....	12.49	92
4.1.2 Social protection.....	46.17	59
4.1.3 Brain retention.....	58.73	35
4.2 Lifestyle.....	28.45	107
4.2.1 Environmental performance.....	24.99	118
4.2.2 Personal safety.....	50.14	72
4.2.3 Physician density.....	1.41	112
4.2.4 Sanitation.....	37.25	114

5 VOCATIONAL AND TECHNICAL SKILLS..... 35.58 85		
5.1 Mid-Level Skills.....	10.60	119
5.1.1 Workforce with secondary education.....	15.60	111
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	5.59	118
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	60.57	38
5.2.1 Ease of finding skilled employees.....	66.86	41
5.2.2 Relevance of education system to the economy.....	60.04	38
5.2.3 Skills matching with secondary education.....	46.65	54
5.2.4 Skills matching with tertiary education.....	68.72	34

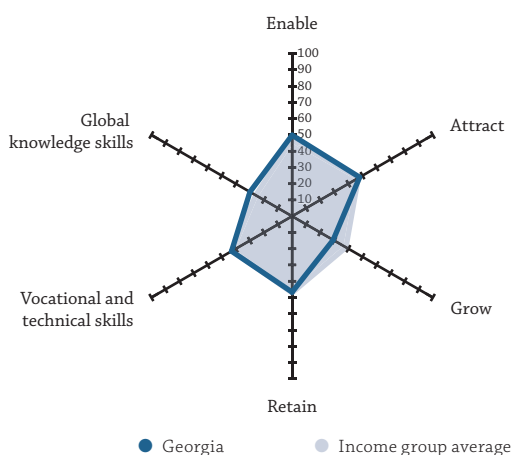
6 GLOBAL KNOWLEDGE SKILLS..... 4.86 131		
6.1 High-Level Skills.....	9.19	125
6.1.1 Workforce with tertiary education.....	0.00	127
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	9.04	111
6.1.4 Researchers.....	0.28	100
6.1.5 Senior officials and managers.....	0.86	125
6.1.6 Availability of scientists and engineers.....	35.79	102
6.2 Talent Impact.....	0.52	129
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	0.23	125
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.82	97

GEORGIA

Key Indicators

Rank (out of 132).....	68
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	3.73

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	49.87	58
1.1 Regulatory Landscape.....	62.19	43
1.1.1 Government effectiveness.....	60.37	41
1.1.2 Rule of law.....	60.35	50
1.1.3 Political stability.....	56.87	87
1.1.4 Regulatory quality.....	73.94	29
1.1.5 Corruption.....	59.46	36
1.2 Market Landscape.....	48.82	71
1.2.1 Competition intensity.....	58.90	93
1.2.2 Ease of doing business.....	94.09	5
1.2.3 Cluster development.....	23.20	111
1.2.4 R&D expenditure.....	6.03	81
1.2.5 ICT infrastructure.....	58.27	65
1.2.6 Urban population.....	52.43	76
1.3 Business and Labour Landscape.....	38.60	89
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	49.01	113
1.3.2 Active labour market policies.....	31.18	88
1.3.3 Labour-employer cooperation.....	33.38	86
1.3.4 Management Practice		
1.3.4 Professional management.....	48.12	68
1.3.5 Relationship of pay to productivity.....	41.96	82
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	36.65	106
1.3.7 Investment in emerging technologies.....	29.90	95
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	47.97	69
2.1 External Openness.....	36.91	88
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	48.64	89
2.1.2 Prevalence of foreign ownership.....	54.69	75
2.1.3 Attract People		
2.1.3 Migrant stock.....	23.93	93
2.1.4 International students.....	20.31	35
2.1.5 Brain gain.....	37.01	88
2.2 Internal Openness.....	59.04	56
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	30.00	91
2.2.2 Tolerance of immigrants.....	57.53	69
2.2.3 Social mobility.....	57.44	65
2.2.4 Gender Equality		
2.2.4 Female graduates.....	81.65	31
2.2.5 Gender development gap.....	80.00	55
2.2.6 Leadership opportunities for women.....	47.58	61

GDP per capita (PPP US\$).....	11,420.63
GDP (US\$ billions).....	16.21
GTCI score.....	41.11
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	29.19	103
3.1 Formal Education.....	17.95	82
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	6.58	91
3.1.2 Tertiary enrolment.....	45.18	49
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	6.74	103
3.1.4 Reading, maths, and science.....	31.23	59
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	23.95	126
3.2.1 Quality of management schools.....	36.58	96
3.2.2 Prevalence of training in firms.....	9.37	93
3.2.3 Employee development.....	25.90	109
3.3 Access to Growth Opportunities.....	45.68	70
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	36.54	92
3.3.2 Personal rights.....	80.01	54
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	74.58	63
3.3.4 Use of virtual professional networks.....	5.13	81
3.3.5 Collaboration within organisations.....	47.82	66
3.3.6 Collaboration across organisations.....	29.99	90

4 RETAIN.....	46.70	68
4.1 Sustainability.....	27.73	105
4.1.1 Pension system.....	29.50	71
4.1.2 Social protection.....	17.82	121
4.1.3 Brain retention.....	35.86	80
4.2 Lifestyle.....	65.67	43
4.2.1 Environmental performance.....	47.11	80
4.2.2 Personal safety.....	55.57	65
4.2.3 Physician density.....	76.28	3
4.2.4 Sanitation.....	83.72	80

5 VOCATIONAL AND TECHNICAL SKILLS.....	43.02	68
5.1 Mid-Level Skills.....	52.51	43
5.1.1 Workforce with secondary education.....	78.97	13
5.1.2 Population with secondary education.....	85.45	5
5.1.3 Technicians and associate professionals.....	31.93	68
5.1.4 Labour productivity per employee.....	13.68	78
5.2 Employability.....	33.53	113
5.2.1 Ease of finding skilled employees.....	40.37	106
5.2.2 Relevance of education system to the economy.....	31.33	100
5.2.3 Skills matching with secondary education.....	25.62	114
5.2.4 Skills matching with tertiary education.....	36.81	114

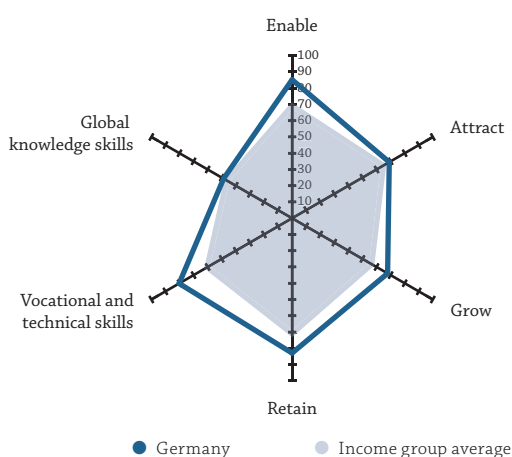
6 GLOBAL KNOWLEDGE SKILLS.....	29.93	54
6.1 High-Level Skills.....	34.61	52
6.1.1 Workforce with tertiary education.....	51.42	33
6.1.2 Population with tertiary education.....	52.21	24
6.1.3 Professionals.....	31.76	55
6.1.4 Researchers.....	16.13	44
6.1.5 Senior officials and managers.....	33.44	42
6.1.6 Availability of scientists and engineers.....	22.69	125
6.2 Talent Impact.....	25.26	56
6.2.1 Innovation output.....	33.98	59
6.2.2 High-value exports.....	8.84	87
6.2.3 New product entrepreneurial activity.....	37.06	60
6.2.4 New business density.....	40.29	16
6.2.5 Scientific journal articles.....	6.12	63

GERMANY

Key Indicators

Rank (out of 132).....	11
Income group.....	High income
Regional group.....	Europe
Population (millions).....	82.93

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....85.21	7	
1.1 Regulatory Landscape.....	87.43	12
1.1.1 Government effectiveness.....	88.22	10
1.1.2 Rule of law.....	90.22	15
1.1.3 Political stability.....	77.67	36
1.1.4 Regulatory quality.....	91.85	10
1.1.5 Corruption.....	89.19	11
1.2 Market Landscape.....	82.23	7
1.2.1 Competition intensity.....	81.81	17
1.2.2 Ease of doing business.....	86.26	22
1.2.3 Cluster development.....	92.94	2
1.2.4 R&D expenditure.....	66.22	8
1.2.5 ICT infrastructure.....	92.24	5
1.2.6 Urban population.....	73.91	40
1.3 Business and Labour Landscape.....	85.96	4
Labour Market		
1.3.1 Tertiary-educated unemployment.....	93.96	8
1.3.2 Active labour market policies.....	86.99	8
1.3.3 Labour-employer cooperation.....	67.15	19
Management Practice		
1.3.4 Professional management.....	79.89	21
1.3.5 Relationship of pay to productivity.....	86.43	5
Technology Adoption		
1.3.6 Technology utilisation.....	86.41	10
1.3.7 Investment in emerging technologies.....	86.85	7
1.3.8 Robot density.....	100.00	1
2 ATTRACT.....69.04	19	
2.1 External Openness.....	66.70	15
Attract Business		
2.1.1 FDI and technology transfer.....	83.51	11
2.1.2 Prevalence of foreign ownership.....	77.98	25
Attract People		
2.1.3 Migrant stock.....	63.79	26
2.1.4 International students.....	29.45	25
2.1.5 Brain gain.....	78.76	11
2.2 Internal Openness.....	71.39	24
Social Inclusion		
2.2.1 Tolerance of minorities.....	60.00	43
2.2.2 Tolerance of immigrants.....	79.45	25
2.2.3 Social mobility.....	79.49	19
Gender Equality		
2.2.4 Female graduates.....	56.87	86
2.2.5 Gender development gap.....	77.05	69
2.2.6 Leadership opportunities for women.....	75.48	17

GDP per capita (PPP US\$).....	54,327.13
GDP (US\$ billions).....	3,996.76
GTCI score.....	72.34
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....67.86	13	
3.1 Formal Education.....	52.59	15
Enrolment		
3.1.1 Vocational enrolment.....	29.52	41
3.1.2 Tertiary enrolment.....	53.78	30
Quality		
3.1.3 Tertiary education expenditure.....	29.02	36
3.1.4 Reading, maths, and science.....	79.52	10
3.1.5 University ranking.....	71.10	9
3.2 Lifelong Learning.....	75.73	13
3.2.1 Quality of management schools.....	72.09	23
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	79.37	10
3.3 Access to Growth Opportunities.....	75.26	16
Empowerment		
3.3.1 Delegation of authority.....	84.54	12
3.3.2 Personal rights.....	98.13	5
Collaboration		
3.3.3 Use of virtual social networks.....	79.59	53
3.3.4 Use of virtual professional networks.....	7.80	69
3.3.5 Collaboration within organisations.....	91.54	5
3.3.6 Collaboration across organisations.....	89.94	2

4 RETAIN.....82.96	10	
4.1 Sustainability.....	81.89	13
4.1.1 Pension system.....	86.02	21
4.1.2 Social protection.....	76.98	19
4.1.3 Brain retention.....	82.68	8
4.2 Lifestyle.....	84.02	7
4.2.1 Environmental performance.....	84.91	13
4.2.2 Personal safety.....	85.11	17
4.2.3 Physician density.....	66.90	8
4.2.4 Sanitation.....	99.16	28

5 VOCATIONAL AND TECHNICAL SKILLS.....80.27	3	
5.1 Mid-Level Skills.....	78.09	1
5.1.1 Workforce with secondary education.....	77.68	15
5.1.2 Population with secondary education.....	79.89	9
5.1.3 Technicians and associate professionals.....	98.91	2
5.1.4 Labour productivity per employee.....	55.89	20
5.2 Employability.....	82.46	7
5.2.1 Ease of finding skilled employees.....	85.09	7
5.2.2 Relevance of education system to the economy.....	81.05	8
5.2.3 Skills matching with secondary education.....	81.77	5
5.2.4 Skills matching with tertiary education.....	81.92	13

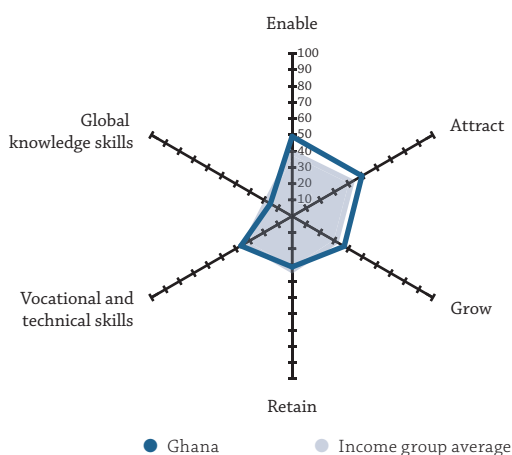
6 GLOBAL KNOWLEDGE SKILLS.....48.69	23	
6.1 High-Level Skills.....	50.16	28
6.1.1 Workforce with tertiary education.....	43.51	41
6.1.2 Population with tertiary education.....	41.23	35
6.1.3 Professionals.....	46.74	31
6.1.4 Researchers.....	60.99	12
6.1.5 Senior officials and managers.....	27.98	53
6.1.6 Availability of scientists and engineers.....	80.50	11
6.2 Talent Impact.....	47.23	24
6.2.1 Innovation output.....	78.28	9
6.2.2 High-value exports.....	41.40	21
6.2.3 New product entrepreneurial activity.....	60.64	22
6.2.4 New business density.....	6.23	64
6.2.5 Scientific journal articles.....	49.61	22

GHANA

Key Indicators

Rank (out of 132).....	87
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	29.77

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....49.10	60	
1.1 Regulatory Landscape.....	49.53	65
1.1.1 Government effectiveness.....	43.83	79
1.1.2 Rule of law.....	55.71	54
1.1.3 Political stability.....	66.91	63
1.1.4 Regulatory quality.....	44.71	78
1.1.5 Corruption.....	36.49	63
1.2 Market Landscape.....	42.84	87
1.2.1 Competition intensity.....	60.19	87
1.2.2 Ease of doing business.....	51.11	97
1.2.3 Cluster development.....	54.22	41
1.2.4 R&D expenditure.....	7.93	71
1.2.5 ICT infrastructure.....	34.10	97
1.2.6 Urban population.....	49.48	85
1.3 Business and Labour Landscape.....	54.92	45
Labour Market		
1.3.1 Tertiary-educated unemployment.....	85.04	48
1.3.2 Active labour market policies.....	48.38	58
1.3.3 Labour-employer cooperation.....	40.66	59
Management Practice		
1.3.4 Professional management.....	63.70	35
1.3.5 Relationship of pay to productivity.....	53.22	58
Technology Adoption		
1.3.6 Technology utilisation.....	44.06	85
1.3.7 Investment in emerging technologies.....	49.40	44
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....49.60	61	
2.1 External Openness.....	43.47	65
Attract Business		
2.1.1 FDI and technology transfer.....	54.06	76
2.1.2 Prevalence of foreign ownership.....	72.14	37
Attract People		
2.1.3 Migrant stock.....	23.31	94
2.1.4 International students.....	10.65	59
2.1.5 Brain gain.....	57.20	35
2.2 Internal Openness.....	55.74	66
Social Inclusion		
2.2.1 Tolerance of minorities.....	68.89	29
2.2.2 Tolerance of immigrants.....	73.97	34
2.2.3 Social mobility.....	58.57	60
Gender Equality		
2.2.4 Female graduates.....	32.18	105
2.2.5 Gender development gap.....	56.71	108
2.2.6 Leadership opportunities for women.....	44.09	70

GDP per capita (PPP US\$).....	4,738.31
GDP (US\$ billions).....	65.56
GTCI score.....	36.45
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....37.03	71	
3.1 Formal Education.....	10.54	107
Enrolment		
3.1.1 Vocational enrolment.....	4.10	99
3.1.2 Tertiary enrolment.....	12.25	98
Quality		
3.1.3 Tertiary education expenditure.....	25.82	47
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	49.98	50
3.2.1 Quality of management schools.....	52.52	52
3.2.2 Prevalence of training in firms.....	48.42	33
3.2.3 Employee development.....	49.01	48
3.3 Access to Growth Opportunities.....	50.58	51
Empowerment		
3.3.1 Delegation of authority.....	53.30	45
3.3.2 Personal rights.....	89.79	36
Collaboration		
3.3.3 Use of virtual social networks.....	55.28	110
3.3.4 Use of virtual professional networks.....	3.92	92
3.3.5 Collaboration within organisations.....	53.19	45
3.3.6 Collaboration across organisations.....	47.98	41

4 RETAIN.....31.20	103	
4.1 Sustainability.....	35.74	81
4.1.1 Pension system.....	9.00	96
4.1.2 Social protection.....	43.23	65
4.1.3 Brain retention.....	55.00	42
4.2 Lifestyle.....	26.66	110
4.2.1 Environmental performance.....	37.06	99
4.2.2 Personal safety.....	60.62	53
4.2.3 Physician density.....	1.23	113
4.2.4 Sanitation.....	7.75	130

5 VOCATIONAL AND TECHNICAL SKILLS.....36.36	84	
5.1 Mid-Level Skills.....	16.93	108
5.1.1 Workforce with secondary education.....	27.56	92
5.1.2 Population with secondary education.....	23.61	90
5.1.3 Technicians and associate professionals.....	10.24	113
5.1.4 Labour productivity per employee.....	6.29	95
5.2 Employability.....	55.80	45
5.2.1 Ease of finding skilled employees.....	68.95	36
5.2.2 Relevance of education system to the economy.....	55.45	43
5.2.3 Skills matching with secondary education.....	36.54	80
5.2.4 Skills matching with tertiary education.....	62.26	44

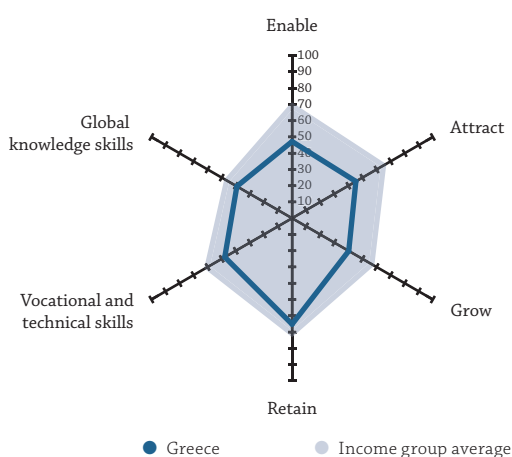
6 GLOBAL KNOWLEDGE SKILLS.....15.43	99	
6.1 High-Level Skills.....	15.95	109
6.1.1 Workforce with tertiary education.....	11.72	101
6.1.2 Population with tertiary education.....	3.35	101
6.1.3 Professionals.....	18.90	83
6.1.4 Researchers.....	0.34	99
6.1.5 Senior officials and managers.....	11.67	88
6.1.6 Availability of scientists and engineers.....	49.72	64
6.2 Talent Impact.....	14.90	87
6.2.1 Innovation output.....	19.79	94
6.2.2 High-value exports.....	24.22	49
6.2.3 New product entrepreneurial activity.....	24.92	75
6.2.4 New business density.....	4.27	73
6.2.5 Scientific journal articles.....	1.33	89

GREECE

Key Indicators

Rank (out of 132).....	47
Income group	High income
Regional group	Europe
Population (millions)	10.73

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.21	69	
1.1 Regulatory Landscape.....	53.37	55
1.1.1 Government effectiveness.....	54.14	50
1.1.2 Rule of law.....	54.62	58
1.1.3 Political stability.....	62.26	73
1.1.4 Regulatory quality.....	53.93	57
1.1.5 Corruption.....	41.89	55
1.2 Market Landscape.....	55.26	54
1.2.1 Competition intensity.....	67.73	68
1.2.2 Ease of doing business.....	66.93	67
1.2.3 Cluster development.....	18.88	121
1.2.4 R&D expenditure.....	24.76	32
1.2.5 ICT infrastructure.....	77.35	32
1.2.6 Urban population.....	75.92	37
1.3 Business and Labour Landscape.....	33.01	110
Labour Market		
1.3.1 Tertiary-educated unemployment.....	53.06	109
1.3.2 Active labour market policies.....	31.92	84
1.3.3 Labour-employer cooperation.....	26.57	100
Management Practice		
1.3.4 Professional management.....	42.99	83
1.3.5 Relationship of pay to productivity.....	35.05	108
Technology Adoption		
1.3.6 Technology utilisation.....	44.22	84
1.3.7 Investment in emerging technologies.....	23.53	109
1.3.8 Robot density.....	6.74	36
2 ATTRACT.....45.31	81	
2.1 External Openness.....	34.16	96
Attract Business		
2.1.1 FDI and technology transfer.....	39.85	109
2.1.2 Prevalence of foreign ownership.....	48.54	96
Attract People		
2.1.3 Migrant stock.....	57.45	38
2.1.4 International students.....	12.20	55
2.1.5 Brain gain.....	12.77	126
2.2 Internal Openness.....	56.45	63
Social Inclusion		
2.2.1 Tolerance of minorities.....	57.78	45
2.2.2 Tolerance of immigrants.....	41.10	98
2.2.3 Social mobility.....	44.83	105
Gender Equality		
2.2.4 Female graduates.....	78.57	41
2.2.5 Gender development gap.....	75.99	74
2.2.6 Leadership opportunities for women.....	40.46	82

GDP per capita (PPP US\$)	29,873.56
GDP (US\$ billions)	218.03
GTCI score.....	47.51
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....40.25	60	
3.1 Formal Education.....	43.55	32
Enrolment		
3.1.1 Vocational enrolment.....	24.22	49
3.1.2 Tertiary enrolment.....	100.00	1
Quality		
3.1.3 Tertiary education expenditure.....	15.55	80
3.1.4 Reading, maths, and science.....	56.20	39
3.1.5 University ranking.....	21.77	48
3.2 Lifelong Learning.....	33.73	105
3.2.1 Quality of management schools.....	46.92	67
3.2.2 Prevalence of training in firms.....	24.01	76
3.2.3 Employee development.....	30.27	95
3.3 Access to Growth Opportunities.....	43.46	85
Empowerment		
3.3.1 Delegation of authority.....	35.09	96
3.3.2 Personal rights.....	86.13	42
Collaboration		
3.3.3 Use of virtual social networks.....	64.85	94
3.3.4 Use of virtual professional networks.....	15.06	47
3.3.5 Collaboration within organisations.....	36.48	100
3.3.6 Collaboration across organisations.....	23.16	112

4 RETAIN.....65.20	30	
4.1 Sustainability.....	42.91	64
4.1.1 Pension system.....	86.60	20
4.1.2 Social protection.....	25.97	108
4.1.3 Brain retention.....	16.17	123
4.2 Lifestyle.....	87.50	3
4.2.1 Environmental performance.....	76.96	22
4.2.2 Personal safety.....	74.14	28
4.2.3 Physician density.....	100.00	1
4.2.4 Sanitation.....	98.89	32

5 VOCATIONAL AND TECHNICAL SKILLS.....47.84	52	
5.1 Mid-Level Skills.....	45.14	58
5.1.1 Workforce with secondary education.....	57.78	44
5.1.2 Population with secondary education.....	46.54	53
5.1.3 Technicians and associate professionals.....	34.12	60
5.1.4 Labour productivity per employee.....	42.12	38
5.2 Employability.....	50.54	60
5.2.1 Ease of finding skilled employees.....	63.00	48
5.2.2 Relevance of education system to the economy.....	25.56	110
5.2.3 Skills matching with secondary education.....	52.62	43
5.2.4 Skills matching with tertiary education.....	60.97	50

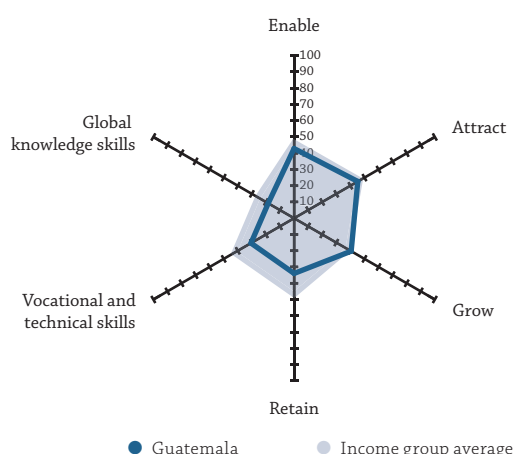
6 GLOBAL KNOWLEDGE SKILLS.....39.24	36	
6.1 High-Level Skills.....	44.82	34
6.1.1 Workforce with tertiary education.....	51.81	31
6.1.2 Population with tertiary education.....	33.05	47
6.1.3 Professionals.....	50.36	23
6.1.4 Researchers.....	38.13	27
6.1.5 Senior officials and managers.....	16.13	78
6.1.6 Availability of scientists and engineers.....	79.42	12
6.2 Talent Impact.....	33.67	43
6.2.1 Innovation output.....	37.13	53
6.2.2 High-value exports.....	32.25	39
6.2.3 New product entrepreneurial activity.....	55.91	32
6.2.4 New business density.....	3.64	76
6.2.5 Scientific journal articles.....	39.42	28

GUATEMALA

Key Indicators

Rank (out of 132).....	95
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	17.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	42.89	88
1.1 Regulatory Landscape.....	34.15	110
1.1.1 Government effectiveness.....	31.03	109
1.1.2 Rule of law.....	27.91	124
1.1.3 Political stability.....	52.43	97
1.1.4 Regulatory quality.....	41.82	91
1.1.5 Corruption.....	17.57	115
1.2 Market Landscape.....	41.58	90
1.2.1 Competition intensity.....	75.84	40
1.2.2 Ease of doing business.....	56.38	86
1.2.3 Cluster development.....	37.08	82
1.2.4 R&D expenditure.....	0.33	116
1.2.5 ICT infrastructure.....	36.13	93
1.2.6 Urban population.....	43.72	94
1.3 Business and Labour Landscape.....	52.93	48
Labour Market		
1.3.1 Tertiary-educated unemployment.....	90.51	22
1.3.2 Active labour market policies.....	12.77	120
1.3.3 Labour-employer cooperation.....	61.04	29
Management Practice		
1.3.4 Professional management.....	51.49	61
1.3.5 Relationship of pay to productivity.....	50.19	61
Technology Adoption		
1.3.6 Technology utilisation.....	66.96	36
1.3.7 Investment in emerging technologies.....	37.54	69
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	45.26	82
2.1 External Openness.....	39.70	78
Attract Business		
2.1.1 FDI and technology transfer.....	56.20	68
2.1.2 Prevalence of foreign ownership.....	53.67	81
Attract People		
2.1.3 Migrant stock.....	11.81	113
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	37.11	87
2.2 Internal Openness.....	50.82	94
Social Inclusion		
2.2.1 Tolerance of minorities.....	10.00	123
2.2.2 Tolerance of immigrants.....	45.21	91
2.2.3 Social mobility.....	57.43	66
Gender Equality		
2.2.4 Female graduates.....	86.50	21
2.2.5 Gender development gap.....	70.27	86
2.2.6 Leadership opportunities for women.....	35.49	94

GDP per capita (PPP US\$).....	8,447.45
GDP (US\$ billions).....	78.46
GTCI score.....	35.28
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	40.55	56
3.1 Formal Education.....	16.66	89
Enrolment		
3.1.1 Vocational enrolment.....	43.61	22
3.1.2 Tertiary enrolment.....	16.73	88
Quality		
3.1.3 Tertiary education expenditure.....	6.31	104
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	57.16	32
3.2.1 Quality of management schools.....	52.42	53
3.2.2 Prevalence of training in firms.....	69.00	12
3.2.3 Employee development.....	50.05	45
3.3 Access to Growth Opportunities.....	47.84	62
Empowerment		
3.3.1 Delegation of authority.....	51.73	53
3.3.2 Personal rights.....	54.93	95
Collaboration		
3.3.3 Use of virtual social networks.....	80.92	45
3.3.4 Use of virtual professional networks.....	5.51	79
3.3.5 Collaboration within organisations.....	50.52	54
3.3.6 Collaboration across organisations.....	43.41	54

4 RETAIN.....	33.97	98
4.1 Sustainability.....	33.05	92
4.1.1 Pension system.....	19.70	80
4.1.2 Social protection.....	29.15	102
4.1.3 Brain retention.....	50.30	45
4.2 Lifestyle.....	34.89	100
4.2.1 Environmental performance.....	41.51	90
4.2.2 Personal safety.....	19.10	122
4.2.3 Physician density.....	14.08	86
4.2.4 Sanitation.....	64.88	96

5 VOCATIONAL AND TECHNICAL SKILLS.....	30.63	106
5.1 Mid-Level Skills.....	16.15	111
5.1.1 Workforce with secondary education.....	18.32	109
5.1.2 Population with secondary education.....	24.52	87
5.1.3 Technicians and associate professionals.....	10.67	110
5.1.4 Labour productivity per employee.....	11.10	84
5.2 Employability.....	45.10	79
5.2.1 Ease of finding skilled employees.....	59.95	54
5.2.2 Relevance of education system to the economy.....	20.81	118
5.2.3 Skills matching with secondary education.....	38.96	77
5.2.4 Skills matching with tertiary education.....	60.69	51

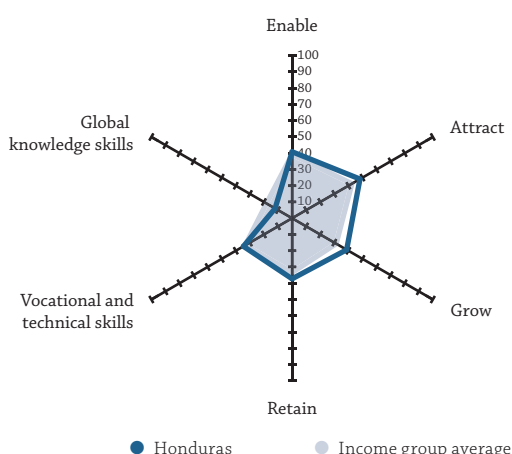
6 GLOBAL KNOWLEDGE SKILLS.....	18.38	88
6.1 High-Level Skills.....	13.53	116
6.1.1 Workforce with tertiary education.....	5.68	116
6.1.2 Population with tertiary education.....	12.22	88
6.1.3 Professionals.....	13.97	98
6.1.4 Researchers.....	0.14	107
6.1.5 Senior officials and managers.....	3.08	119
6.1.6 Availability of scientists and engineers.....	46.07	70
6.2 Talent Impact.....	23.22	63
6.2.1 Innovation output.....	18.21	99
6.2.2 High-value exports.....	15.05	70
6.2.3 New product entrepreneurial activity.....	80.15	8
6.2.4 New business density.....	2.55	83
6.2.5 Scientific journal articles.....	0.16	121

HONDURAS

Key Indicators

Rank (out of 132).....	94
Income group.....	Lower-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	9.59

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 40.90 93		
1.1 Regulatory Landscape..... 34.58 108		
1.1.1 Government effectiveness..... 34.14 99		
1.1.2 Rule of law..... 28.23 122		
1.1.3 Political stability..... 52.89 95		
1.1.4 Regulatory quality..... 37.38 100		
1.1.5 Corruption..... 20.27 107		
1.2 Market Landscape..... 40.56 94		
1.2.1 Competition intensity..... 70.31 62		
1.2.2 Ease of doing business..... 49.32 101		
1.2.3 Cluster development..... 42.51 67		
1.2.4 R&D expenditure..... 0.01 117		
1.2.5 ICT infrastructure..... 30.53 102		
1.2.6 Urban population..... 50.67 81		
1.3 Business and Labour Landscape..... 47.56 61		
Labour Market		
1.3.1 Tertiary-educated unemployment..... 74.83 84		
1.3.2 Active labour market policies..... 21.29 108		
1.3.3 Labour-employer cooperation..... 51.02 42		
Management Practice		
1.3.4 Professional management..... 47.60 71		
1.3.5 Relationship of pay to productivity..... 46.42 71		
Technology Adoption		
1.3.6 Technology utilisation..... 55.87 55		
1.3.7 Investment in emerging technologies..... 35.90 75		
1.3.8 Robot density..... n/a n/a		
2 ATTRACT..... 48.22 68		
2.1 External Openness..... 34.79 95		
Attract Business		
2.1.1 FDI and technology transfer..... 64.64 49		
2.1.2 Prevalence of foreign ownership..... 57.65 65		
Attract People		
2.1.3 Migrant stock..... 9.76 118		
2.1.4 International students..... 2.71 88		
2.1.5 Brain gain..... 39.17 82		
2.2 Internal Openness..... 61.65 51		
Social Inclusion		
2.2.1 Tolerance of minorities..... 52.22 55		
2.2.2 Tolerance of immigrants..... 47.95 85		
2.2.3 Social mobility..... 56.23 69		
Gender Equality		
2.2.4 Female graduates..... 91.75 11		
2.2.5 Gender development gap..... 80.92 50		
2.2.6 Leadership opportunities for women..... 40.84 81		

GDP per capita (PPP US\$).....	5,129.69
GDP (US\$ billions).....	23.80
GTGI score.....	35.31
GTGI score (income group average).....	32.97

	Score	Rank
3 GROW..... 38.77 65		
3.1 Formal Education..... 23.74 69		
Enrolment		
3.1.1 Vocational enrolment..... 59.58 7		
3.1.2 Tertiary enrolment..... 15.93 90		
Quality		
3.1.3 Tertiary education expenditure..... 19.44 69		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 0.00 75		
3.2 Lifelong Learning..... 46.95 55		
3.2.1 Quality of management schools..... 36.06 100		
3.2.2 Prevalence of training in firms..... 58.44 23		
3.2.3 Employee development..... 46.34 53		
3.3 Access to Growth Opportunities..... 45.64 71		
Empowerment		
3.3.1 Delegation of authority..... 48.27 62		
3.3.2 Personal rights..... 64.08 84		
Collaboration		
3.3.3 Use of virtual social networks..... 70.28 80		
3.3.4 Use of virtual professional networks..... 4.69 86		
3.3.5 Collaboration within organisations..... 47.92 64		
3.3.6 Collaboration across organisations..... 38.58 72		

4 RETAIN..... 37.27 94		
4.1 Sustainability..... 29.72 99		
4.1.1 Pension system..... 17.30 84		
4.1.2 Social protection..... 30.36 97		
4.1.3 Brain retention..... 41.50 63		
4.2 Lifestyle..... 44.82 91		
4.2.1 Environmental performance..... 40.14 93		
4.2.2 Personal safety..... 16.09 124		
4.2.3 Physician density..... n/a n/a		
4.2.4 Sanitation..... 78.24 85		

5 VOCATIONAL AND TECHNICAL SKILLS..... 34.59 92		
5.1 Mid-Level Skills..... 23.41 96		
5.1.1 Workforce with secondary education..... 26.92 96		
5.1.2 Population with secondary education..... 18.43 97		
5.1.3 Technicians and associate professionals..... 24.88 82		
5.1.4 Labour productivity per employee..... n/a n/a		
5.2 Employability..... 45.77 75		
5.2.1 Ease of finding skilled employees..... 53.10 69		
5.2.2 Relevance of education system to the economy..... 34.76 91		
5.2.3 Skills matching with secondary education..... 43.73 62		
5.2.4 Skills matching with tertiary education..... 51.47 74		

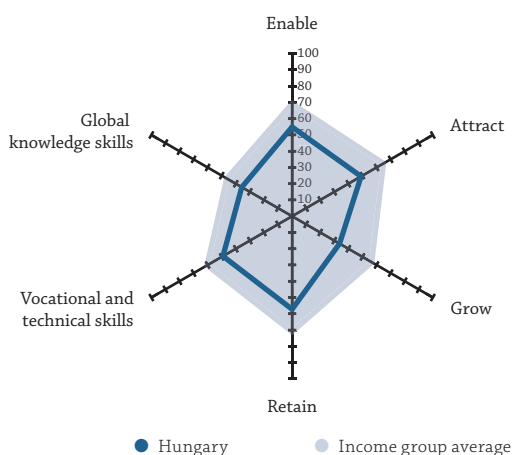
6 GLOBAL KNOWLEDGE SKILLS..... 12.08 109		
6.1 High-Level Skills..... 15.23 111		
6.1.1 Workforce with tertiary education..... 8.22 109		
6.1.2 Population with tertiary education..... 15.94 78		
6.1.3 Professionals..... 10.30 109		
6.1.4 Researchers..... 0.15 106		
6.1.5 Senior officials and managers..... 16.77 75		
6.1.6 Availability of scientists and engineers..... 40.01 88		
6.2 Talent Impact..... 8.92 107		
6.2.1 Innovation output..... 17.69 101		
6.2.2 High-value exports..... 8.98 86		
6.2.3 New product entrepreneurial activity..... n/a n/a		
6.2.4 New business density..... n/a n/a		
6.2.5 Scientific journal articles..... 0.10 128		

HUNGARY

Key Indicators

Rank (out of 132).....	52
Income group.....	High income
Regional group.....	Europe
Population (millions).....	9.77

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	54.91	47
1.1 Regulatory Landscape.....	62.83	42
1.1.1 Government effectiveness.....	58.99	43
1.1.2 Rule of law.....	65.03	40
1.1.3 Political stability.....	82.87	28
1.1.4 Regulatory quality.....	64.04	41
1.1.5 Corruption.....	43.24	54
1.2 Market Landscape.....	57.59	46
1.2.1 Competition intensity.....	53.31	110
1.2.2 Ease of doing business.....	74.44	49
1.2.3 Cluster development.....	43.77	60
1.2.4 R&D expenditure.....	29.38	25
1.2.5 ICT infrastructure.....	77.61	31
1.2.6 Urban population.....	67.06	50
1.3 Business and Labour Landscape.....	44.29	70
Labour Market		
1.3.1 Tertiary-educated unemployment.....	95.31	5
1.3.2 Active labour market policies.....	46.15	61
1.3.3 Labour-employer cooperation.....	33.93	82
Management Practice		
1.3.4 Professional management.....	38.17	94
1.3.5 Relationship of pay to productivity.....	38.67	90
Technology Adoption		
1.3.6 Technology utilisation.....	48.83	68
1.3.7 Investment in emerging technologies.....	28.34	99
1.3.8 Robot density.....	24.95	22
2 ATTRACT.....	49.01	63
2.1 External Openness.....	48.19	52
Attract Business		
2.1.1 FDI and technology transfer.....	72.09	31
2.1.2 Prevalence of foreign ownership.....	63.17	55
Attract People		
2.1.3 Migrant stock.....	41.48	62
2.1.4 International students.....	32.46	20
2.1.5 Brain gain.....	31.75	95
2.2 Internal Openness.....	49.84	96
Social Inclusion		
2.2.1 Tolerance of minorities.....	64.44	35
2.2.2 Tolerance of immigrants.....	0.00	129
2.2.3 Social mobility.....	43.44	108
Gender Equality		
2.2.4 Female graduates.....	83.85	25
2.2.5 Gender development gap.....	83.61	40
2.2.6 Leadership opportunities for women.....	23.68	115

GDP per capita (PPP US\$).....	30,978.89
GDP (US\$ billions).....	155.70
GTCI score.....	46.62
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	33.73	83
3.1 Formal Education.....	30.55	53
Enrolment		
3.1.1 Vocational enrolment.....	17.91	60
3.1.2 Tertiary enrolment.....	37.62	58
Quality		
3.1.3 Tertiary education expenditure.....	13.72	86
3.1.4 Reading, maths, and science.....	63.66	35
3.1.5 University ranking.....	19.84	51
3.2 Lifelong Learning.....	30.20	111
3.2.1 Quality of management schools.....	44.96	77
3.2.2 Prevalence of training in firms.....	16.36	89
3.2.3 Employee development.....	29.28	96
3.3 Access to Growth Opportunities.....	40.43	97
Empowerment		
3.3.1 Delegation of authority.....	39.68	84
3.3.2 Personal rights.....	79.59	56
Collaboration		
3.3.3 Use of virtual social networks.....	65.78	92
3.3.4 Use of virtual professional networks.....	9.90	61
3.3.5 Collaboration within organisations.....	33.89	105
3.3.6 Collaboration across organisations.....	13.71	130

4 RETAIN.....	57.23	50
4.1 Sustainability.....	44.13	60
4.1.1 Pension system.....	87.52	19
4.1.2 Social protection.....	22.61	113
4.1.3 Brain retention.....	22.26	112
4.2 Lifestyle.....	70.32	34
4.2.1 Environmental performance.....	62.64	39
4.2.2 Personal safety.....	71.51	32
4.2.3 Physician density.....	49.29	34
4.2.4 Sanitation.....	97.84	39

5 VOCATIONAL AND TECHNICAL SKILLS.....	49.13	48
5.1 Mid-Level Skills.....	65.77	10
5.1.1 Workforce with secondary education.....	82.94	10
5.1.2 Population with secondary education.....	76.95	13
5.1.3 Technicians and associate professionals.....	63.78	20
5.1.4 Labour productivity per employee.....	39.43	41
5.2 Employability.....	32.49	117
5.2.1 Ease of finding skilled employees.....	23.56	130
5.2.2 Relevance of education system to the economy.....	27.67	108
5.2.3 Skills matching with secondary education.....	34.86	84
5.2.4 Skills matching with tertiary education.....	43.87	95

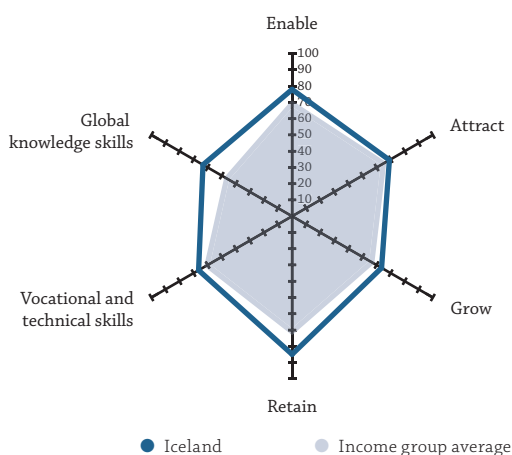
6 GLOBAL KNOWLEDGE SKILLS.....	35.74	41
6.1 High-Level Skills.....	36.14	49
6.1.1 Workforce with tertiary education.....	39.25	48
6.1.2 Population with tertiary education.....	33.37	45
6.1.3 Professionals.....	39.96	41
6.1.4 Researchers.....	35.36	29
6.1.5 Senior officials and managers.....	26.13	58
6.1.6 Availability of scientists and engineers.....	42.80	81
6.2 Talent Impact.....	35.33	39
6.2.1 Innovation output.....	56.57	25
6.2.2 High-value exports.....	41.08	25
6.2.3 New product entrepreneurial activity.....	37.73	58
6.2.4 New business density.....	16.25	36
6.2.5 Scientific journal articles.....	25.04	39

ICELAND

Key Indicators

Rank (out of 132).....	14
Income group	High income
Regional group	Europe
Population (millions)	0.35

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....78.01 16		
1.1 Regulatory Landscape.....86.81 13		
1.1.1 Government effectiveness.....81.71 16		
1.1.2 Rule of law.....90.18 16		
1.1.3 Political stability.....95.12 3		
1.1.4 Regulatory quality.....83.24 18		
1.1.5 Corruption.....83.78 14		
1.2 Market Landscape.....75.06 15		
1.2.1 Competition intensity.....71.27 60		
1.2.2 Ease of doing business.....87.07 19		
1.2.3 Cluster development.....53.75 42		
1.2.4 R&D expenditure.....47.44 14		
1.2.5 ICT infrastructure.....97.96 2		
1.2.6 Urban population.....92.89 7		
1.3 Business and Labour Landscape.....72.15 16		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....93.99 7		
1.3.2 Active labour market policies.....89.01 6		
1.3.3 Labour-employer cooperation.....76.00 11		
1.3.4 Management Practice		
1.3.4 Professional management.....81.68 19		
1.3.5 Relationship of pay to productivity.....68.69 25		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....96.05 4		
1.3.7 Investment in emerging technologies.....65.70 24		
1.3.8 Robot density.....6.06 38		
2 ATTRACT.....69.13 18		
2.1 External Openness.....46.26 54		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....56.48 66		
2.1.2 Prevalence of foreign ownership.....33.10 120		
2.1.3 Attract People		
2.1.3 Migrant stock.....58.94 35		
2.1.4 International students.....24.82 31		
2.1.5 Brain gain.....57.97 33		
2.2 Internal Openness.....91.99 1		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....100.00 1		
2.2.2 Tolerance of immigrants.....94.52 7		
2.2.3 Social mobility.....94.29 4		
2.2.4 Gender Equality		
2.2.4 Female graduates.....91.76 10		
2.2.5 Gender development gap.....76.67 73		
2.2.6 Leadership opportunities for women.....94.70 2		

GDP per capita (PPP US\$)	57,597.32
GDP (US\$ billions)	25.88
GTCI score.....	70.90
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....63.57 18		
3.1 Formal Education.....38.29 38		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....32.36 35		
3.1.2 Tertiary enrolment.....57.98 23		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....34.37 23		
3.1.4 Reading, maths, and science.....66.75 32		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....72.34 18		
3.2.1 Quality of management schools.....72.89 20		
3.2.2 Prevalence of training in firms.....n/a n/a		
3.2.3 Employee development.....71.79 17		
3.3 Access to Growth Opportunities.....80.08 8		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....81.55 17		
3.3.2 Personal rights.....96.12 17		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....100.00 1		
3.3.4 Use of virtual professional networks.....54.65 9		
3.3.5 Collaboration within organisations.....85.39 10		
3.3.6 Collaboration across organisations.....62.78 20		

4 RETAIN.....84.96 6		
4.1 Sustainability.....84.04 8		
4.1.1 Pension system.....n/a n/a		
4.1.2 Social protection.....88.25 10		
4.1.3 Brain retention.....79.82 10		
4.2 Lifestyle.....85.89 4		
4.2.1 Environmental performance.....85.25 11		
4.2.2 Personal safety.....99.15 3		
4.2.3 Physician density.....60.49 16		
4.2.4 Sanitation.....98.68 34		

5 VOCATIONAL AND TECHNICAL SKILLS.....66.43 14		
5.1 Mid-Level Skills.....54.75 34		
5.1.1 Workforce with secondary education.....46.99 64		
5.1.2 Population with secondary education.....n/a n/a		
5.1.3 Technicians and associate professionals.....60.65 24		
5.1.4 Labour productivity per employee.....56.62 19		
5.2 Employability.....78.11 11		
5.2.1 Ease of finding skilled employees.....78.83 15		
5.2.2 Relevance of education system to the economy.....70.51 15		
5.2.3 Skills matching with secondary education.....79.04 7		
5.2.4 Skills matching with tertiary education.....84.05 9		

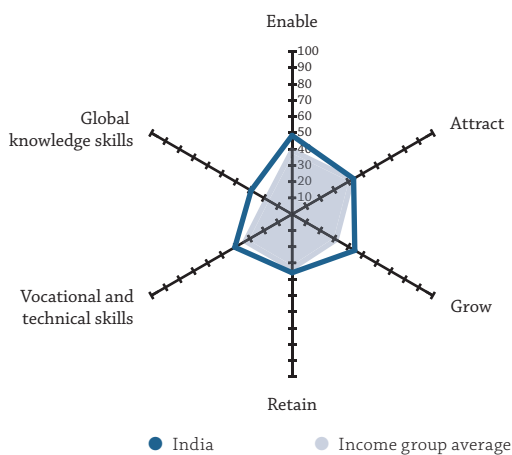
6 GLOBAL KNOWLEDGE SKILLS.....63.31 7		
6.1 High-Level Skills.....68.29 5		
6.1.1 Workforce with tertiary education.....58.36 21		
6.1.2 Population with tertiary education.....n/a n/a		
6.1.3 Professionals.....67.70 6		
6.1.4 Researchers.....80.40 7		
6.1.5 Senior officials and managers.....63.40 13		
6.1.6 Availability of scientists and engineers.....71.60 20		
6.2 Talent Impact.....58.33 12		
6.2.1 Innovation output.....65.85 17		
6.2.2 High-value exports.....32.00 40		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....58.47 9		
6.2.5 Scientific journal articles.....77.00 7		

INDIA

Key Indicators

Rank (out of 132).....	72
Income group.....	Lower-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	1,352.62

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 48.47 63		
1.1 Regulatory Landscape..... 45.35 78		
1.1.1 Government effectiveness..... 48.76 66		
1.1.2 Rule of law..... 52.78 65		
1.1.3 Political stability..... 46.88 109		
1.1.4 Regulatory quality..... 41.85 90		
1.1.5 Corruption..... 36.49 63		
1.2 Market Landscape..... 43.61 84		
1.2.1 Competition intensity..... 67.16 69		
1.2.2 Ease of doing business..... 65.42 71		
1.2.3 Cluster development..... 67.25 24		
1.2.4 R&D expenditure..... 13.27 51		
1.2.5 ICT infrastructure..... 24.43 108		
1.2.6 Urban population..... 24.14 117		
1.3 Business and Labour Landscape..... 56.45 42		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... 72.44 89		
1.3.2 Active labour market policies..... 67.79 32		
1.3.3 Labour-employer cooperation..... 50.77 44		
1.3.4 Management Practice		
1.3.4 Professional management..... 66.19 31		
1.3.5 Relationship of pay to productivity..... 69.40 22		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 59.61 50		
1.3.7 Investment in emerging technologies..... 64.29 26		
1.3.8 Robot density..... 1.09 51		
2 ATTRACT..... 43.71 92		
2.1 External Openness..... 40.71 74		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 63.84 52		
2.1.2 Prevalence of foreign ownership..... 61.24 58		
2.1.3 Attract People		
2.1.3 Migrant stock..... 9.69 119		
2.1.4 International students..... 0.41 106		
2.1.5 Brain gain..... 68.38 20		
2.2 Internal Openness..... 46.70 104		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 22.22 103		
2.2.2 Tolerance of immigrants..... 47.95 85		
2.2.3 Social mobility..... 67.56 36		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 59.38 84		
2.2.5 Gender development gap..... 32.29 126		
2.2.6 Leadership opportunities for women..... 50.83 58		

GDP per capita (PPP US\$).....	7,761.60
GDP (US\$ billions).....	2,726.32
GTCI score.....	40.42
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW..... 44.55 44		
3.1 Formal Education..... 24.06 68		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... 2.00 111		
3.1.2 Tertiary enrolment..... 21.31 84		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... 25.09 50		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 47.84 21		
3.2 Lifelong Learning..... 54.03 40		
3.2.1 Quality of management schools..... 59.32 42		
3.2.2 Prevalence of training in firms..... 42.88 38		
3.2.3 Employee development..... 59.90 30		
3.3 Access to Growth Opportunities..... 55.57 39		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 59.28 35		
3.3.2 Personal rights..... 70.93 73		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 58.89 104		
3.3.4 Use of virtual professional networks..... 9.85 62		
3.3.5 Collaboration within organisations..... 65.68 27		
3.3.6 Collaboration across organisations..... 68.81 14		

4 RETAIN..... 35.99 95		
4.1 Sustainability..... 46.56 53		
4.1.1 Pension system..... 13.70 89		
4.1.2 Social protection..... 54.42 42		
4.1.3 Brain retention..... 71.56 23		
4.2 Lifestyle..... 25.41 115		
4.2.1 Environmental performance..... 5.23 128		
4.2.2 Personal safety..... 44.66 87		
4.2.3 Physician density..... 11.85 92		
4.2.4 Sanitation..... 39.90 111		

5 VOCATIONAL AND TECHNICAL SKILLS..... 40.66 76		
5.1 Mid-Level Skills..... 14.39 113		
5.1.1 Workforce with secondary education..... 10.46 115		
5.1.2 Population with secondary education..... 22.92 92		
5.1.3 Technicians and associate professionals..... 13.67 106		
5.1.4 Labour productivity per employee..... 10.50 85		
5.2 Employability..... 66.92 28		
5.2.1 Ease of finding skilled employees..... 70.91 30		
5.2.2 Relevance of education system to the economy..... 68.66 18		
5.2.3 Skills matching with secondary education..... 63.19 29		
5.2.4 Skills matching with tertiary education..... 64.93 38		

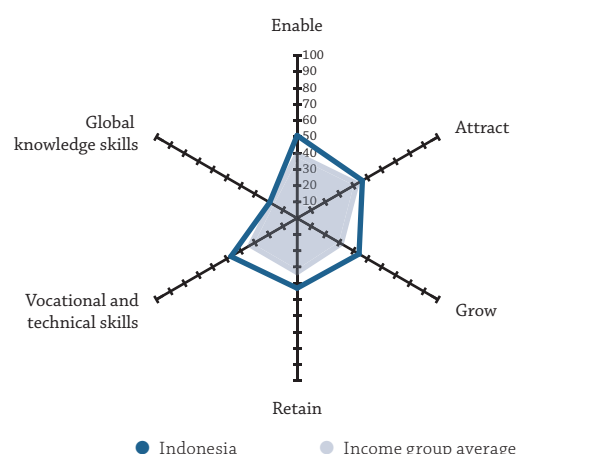
6 GLOBAL KNOWLEDGE SKILLS..... 29.15 57		
6.1 High-Level Skills..... 26.13 75		
6.1.1 Workforce with tertiary education..... 14.28 94		
6.1.2 Population with tertiary education..... 14.46 79		
6.1.3 Professionals..... 8.91 112		
6.1.4 Researchers..... 2.50 78		
6.1.5 Senior officials and managers..... 43.62 29		
6.1.6 Availability of scientists and engineers..... 72.98 19		
6.2 Talent Impact..... 32.18 45		
6.2.1 Innovation output..... 38.70 50		
6.2.2 High-value exports..... 20.87 58		
6.2.3 New product entrepreneurial activity..... 97.60 3		
6.2.4 New business density..... 0.47 98		
6.2.5 Scientific journal articles..... 3.26 76		

INDONESIA

Key Indicators

Rank (out of 132).....	65
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	267.66

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	50.92	54
1.1 Regulatory Landscape.....	44.76	80
1.1.1 Government effectiveness.....	47.53	69
1.1.2 Rule of law.....	44.57	85
1.1.3 Political stability.....	53.78	93
1.1.4 Regulatory quality.....	45.48	74
1.1.5 Corruption.....	32.43	73
1.2 Market Landscape.....	50.59	66
1.2.1 Competition intensity.....	76.50	36
1.2.2 Ease of doing business.....	66.72	68
1.2.3 Cluster development.....	66.44	26
1.2.4 R&D expenditure.....	4.90	86
1.2.5 ICT infrastructure.....	40.33	86
1.2.6 Urban population.....	48.63	88
1.3 Business and Labour Landscape.....	57.41	37
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	81.95	61
1.3.2 Active labour market policies.....	60.64	38
1.3.3 Labour-employer cooperation.....	47.21	49
1.3.4 Management Practice		
1.3.4 Professional management.....	59.72	40
1.3.5 Relationship of pay to productivity.....	71.76	17
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	73.64	29
1.3.7 Investment in emerging technologies.....	62.78	27
1.3.8 Robot density.....	1.56	46
2 ATTRACT.....	46.39	78
2.1 External Openness.....	38.29	82
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	66.69	44
2.1.2 Prevalence of foreign ownership.....	58.61	64
2.1.3 Attract People		
2.1.3 Migrant stock.....	1.52	130
2.1.4 International students.....	0.17	110
2.1.5 Brain gain.....	64.48	27
2.2 Internal Openness.....	54.49	72
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	30.00	91
2.2.2 Tolerance of immigrants.....	20.55	118
2.2.3 Social mobility.....	67.13	38
2.2.4 Gender Equality		
2.2.4 Female graduates.....	77.58	44
2.2.5 Gender development gap.....	64.75	96
2.2.6 Leadership opportunities for women.....	66.94	27

GDP per capita (PPP US\$).....	13,056.55
GDP (US\$ billions).....	1,042.17
GTCI score.....	41.81
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	44.03	48
3.1 Formal Education.....	25.97	66
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	29.74	38
3.1.2 Tertiary enrolment.....	28.26	72
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	11.39	93
3.1.4 Reading, maths, and science.....	26.56	61
3.1.5 University ranking.....	33.87	34
3.2 Lifelong Learning.....	43.15	67
3.2.1 Quality of management schools.....	59.42	41
3.2.2 Prevalence of training in firms.....	5.67	95
3.2.3 Employee development.....	64.35	27
3.3 Access to Growth Opportunities.....	62.98	26
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	66.93	25
3.3.2 Personal rights.....	74.47	65
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	83.36	38
3.3.4 Use of virtual professional networks.....	6.31	74
3.3.5 Collaboration within organisations.....	71.27	24
3.3.6 Collaboration across organisations.....	75.52	10

4 RETAIN.....	43.04	81
4.1 Sustainability.....	44.14	59
4.1.1 Pension system.....	10.50	95
4.1.2 Social protection.....	56.11	40
4.1.3 Brain retention.....	65.81	27
4.2 Lifestyle.....	41.94	94
4.2.1 Environmental performance.....	32.49	106
4.2.2 Personal safety.....	66.92	39
4.2.3 Physician density.....	2.92	106
4.2.4 Sanitation.....	65.44	95

5 VOCATIONAL AND TECHNICAL SKILLS.....	47.01	55
5.1 Mid-Level Skills.....	28.55	87
5.1.1 Workforce with secondary education.....	39.41	75
5.1.2 Population with secondary education.....	33.50	69
5.1.3 Technicians and associate professionals.....	25.70	78
5.1.4 Labour productivity per employee.....	15.60	75
5.2 Employability.....	65.46	30
5.2.1 Ease of finding skilled employees.....	70.47	31
5.2.2 Relevance of education system to the economy.....	61.73	35
5.2.3 Skills matching with secondary education.....	57.22	35
5.2.4 Skills matching with tertiary education.....	72.42	29

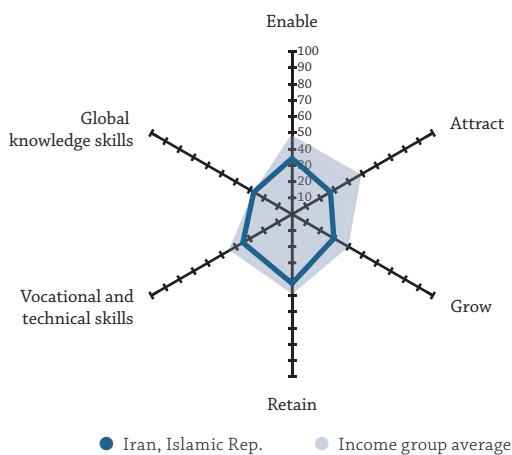
6 GLOBAL KNOWLEDGE SKILLS.....	19.47	84
6.1 High-Level Skills.....	24.71	82
6.1.1 Workforce with tertiary education.....	17.72	91
6.1.2 Population with tertiary education.....	13.65	83
6.1.3 Professionals.....	2.40	124
6.1.4 Researchers.....	2.49	79
6.1.5 Senior officials and managers.....	43.59	30
6.1.6 Availability of scientists and engineers.....	68.42	28
6.2 Talent Impact.....	14.24	91
6.2.1 Innovation output.....	25.22	76
6.2.2 High-value exports.....	16.93	65
6.2.3 New product entrepreneurial activity.....	26.34	71
6.2.4 New business density.....	1.56	90
6.2.5 Scientific journal articles.....	1.13	92

IRAN, ISLAMIC REP.

Key Indicators

Rank (out of 132).....	102
Income group.....	Upper-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	81.80

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	34.36	114
1.1 Regulatory Landscape.....	32.16	114
1.1.1 Government effectiveness.....	41.91	86
1.1.2 Rule of law.....	36.71	107
1.1.3 Political stability.....	44.60	112
1.1.4 Regulatory quality.....	18.66	128
1.1.5 Corruption.....	18.92	112
1.2 Market Landscape.....	46.28	76
1.2.1 Competition intensity.....	51.11	114
1.2.2 Ease of doing business.....	47.11	107
1.2.3 Cluster development.....	38.75	78
1.2.4 R&D expenditure.....	5.22	84
1.2.5 ICT infrastructure.....	64.38	58
1.2.6 Urban population.....	71.14	44
1.3 Business and Labour Landscape.....	24.62	126
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	37.00	119
1.3.2 Active labour market policies.....	31.88	85
1.3.3 Labour-employer cooperation.....	13.13	118
1.3.4 Management Practice		
1.3.4 Professional management.....	23.14	125
1.3.5 Relationship of pay to productivity.....	36.38	102
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	27.54	117
1.3.7 Investment in emerging technologies.....	27.77	101
1.3.8 Robot density.....	0.12	63
2 ATTRACT.....	27.27	131
2.1 External Openness.....	23.06	126
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	47.28	94
2.1.2 Prevalence of foreign ownership.....	14.70	131
2.1.3 Attract People		
2.1.3 Migrant stock.....	32.05	79
2.1.4 International students.....	1.48	94
2.1.5 Brain gain.....	19.80	118
2.2 Internal Openness.....	31.48	129
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	5.56	126
2.2.2 Tolerance of immigrants.....	45.21	91
2.2.3 Social mobility.....	44.25	107
2.2.4 Gender Equality		
2.2.4 Female graduates.....	32.65	104
2.2.5 Gender development gap.....	42.99	116
2.2.6 Leadership opportunities for women.....	18.26	122

GDP per capita (PPP US\$).....	21,011.29
GDP (US\$ billions).....	454.01
GTGI score.....	32.68
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	29.68	101
3.1 Formal Education.....	31.68	51
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	20.73	56
3.1.2 Tertiary enrolment.....	54.19	29
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	28.70	38
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	23.10	46
3.2 Lifelong Learning.....	29.63	115
3.2.1 Quality of management schools.....	35.93	101
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	23.33	118
3.3 Access to Growth Opportunities.....	27.74	125
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	19.17	125
3.3.2 Personal rights.....	24.09	121
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	41.10	124
3.3.4 Use of virtual professional networks.....	n/a	n/a
3.3.5 Collaboration within organisations.....	30.25	117
3.3.6 Collaboration across organisations.....	24.07	110

4 RETAIN.....	42.61	82
4.1 Sustainability.....	35.57	82
4.1.1 Pension system.....	39.30	62
4.1.2 Social protection.....	44.31	64
4.1.3 Brain retention.....	23.12	107
4.2 Lifestyle.....	49.64	82
4.2.1 Environmental performance.....	51.23	69
4.2.2 Personal safety.....	36.32	101
4.2.3 Physician density.....	23.60	75
4.2.4 Sanitation.....	87.40	74

5 VOCATIONAL AND TECHNICAL SKILLS.....	34.95	89
5.1 Mid-Level Skills.....	32.11	80
5.1.1 Workforce with secondary education.....	n/a	n/a
5.1.2 Population with secondary education.....	34.91	67
5.1.3 Technicians and associate professionals.....	24.03	84
5.1.4 Labour productivity per employee.....	37.38	45
5.2 Employability.....	37.80	97
5.2.1 Ease of finding skilled employees.....	52.66	75
5.2.2 Relevance of education system to the economy.....	30.66	102
5.2.3 Skills matching with secondary education.....	31.64	97
5.2.4 Skills matching with tertiary education.....	36.23	116

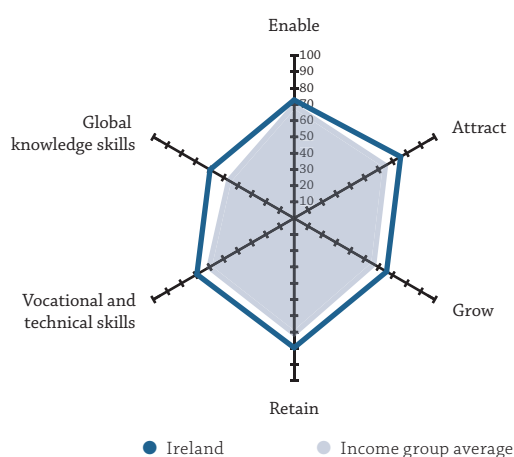
6 GLOBAL KNOWLEDGE SKILLS.....	27.23	65
6.1 High-Level Skills.....	30.46	61
6.1.1 Workforce with tertiary education.....	n/a	n/a
6.1.2 Population with tertiary education.....	36.11	42
6.1.3 Professionals.....	25.81	66
6.1.4 Researchers.....	8.02	59
6.1.5 Senior officials and managers.....	16.89	74
6.1.6 Availability of scientists and engineers.....	65.45	32
6.2 Talent Impact.....	24.00	60
6.2.1 Innovation output.....	41.16	46
6.2.2 High-value exports.....	3.91	104
6.2.3 New product entrepreneurial activity.....	30.57	65
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	20.38	42

IRELAND

Key Indicators

Rank (out of 132).....	15
Income group.....	High income
Regional group.....	Europe
Population (millions).....	4.85

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....72.77	21	
1.1 Regulatory Landscape.....83.59	17	
1.1.1 Government effectiveness.....77.84	22	
1.1.2 Rule of law.....86.01	19	
1.1.3 Political stability.....87.37	17	
1.1.4 Regulatory quality.....86.99	16	
1.1.5 Corruption.....79.73	17	
1.2 Market Landscape.....64.45	30	
1.2.1 Competition intensity.....70.19	63	
1.2.2 Ease of doing business.....86.28	21	
1.2.3 Cluster development.....67.83	22	
1.2.4 R&D expenditure.....22.56	34	
1.2.5 ICT infrastructure.....82.19	20	
1.2.6 Urban population.....57.65	68	
1.3 Business and Labour Landscape.....70.26	20	
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....87.53	39	
1.3.2 Active labour market policies.....77.12	15	
1.3.3 Labour-employer cooperation.....66.15	20	
1.3.4 Management Practice		
1.3.4 Professional management.....93.42	8	
1.3.5 Relationship of pay to productivity.....76.05	11	
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....79.12	17	
1.3.7 Investment in emerging technologies.....70.53	17	
1.3.8 Robot density.....12.16	31	
2 ATTRACT.....75.71	9	
2.1 External Openness.....71.88	9	
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....100.00	1	
2.1.2 Prevalence of foreign ownership.....87.52	7	
2.1.3 Attract People		
2.1.3 Migrant stock.....66.23	20	
2.1.4 International students.....30.00	23	
2.1.5 Brain gain.....75.67	14	
2.2 Internal Openness.....79.53	13	
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....100.00	1	
2.2.2 Tolerance of immigrants.....91.78	8	
2.2.3 Social mobility.....82.07	17	
2.2.4 Gender Equality		
2.2.4 Female graduates.....59.85	82	
2.2.5 Gender development gap.....81.59	47	
2.2.6 Leadership opportunities for women.....61.92	37	

GDP per capita (PPP US\$).....	84,069.44
GDP (US\$ billions).....	375.90
GTCI score.....	70.45
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....65.72	14	
3.1 Formal Education.....46.65	24	
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....24.98	46	
3.1.2 Tertiary enrolment.....61.13	20	
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....19.49	67	
3.1.4 Reading, maths, and science.....79.97	9	
3.1.5 University ranking.....47.67	22	
3.2 Lifelong Learning.....76.40	12	
3.2.1 Quality of management schools.....78.75	12	
3.2.2 Prevalence of training in firms.....n/a	n/a	
3.2.3 Employee development.....74.04	14	
3.3 Access to Growth Opportunities.....74.13	18	
3.3.1 Empowerment		
3.3.1 Delegation of authority.....85.02	11	
3.3.2 Personal rights.....94.97	23	
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....87.99	20	
3.3.4 Use of virtual professional networks.....38.67	15	
3.3.5 Collaboration within organisations.....76.74	19	
3.3.6 Collaboration across organisations.....61.37	23	

4 RETAIN.....79.67	13	
4.1 Sustainability.....81.97	12	
4.1.1 Pension system.....100.00	1	
4.1.2 Social protection.....73.64	23	
4.1.3 Brain retention.....72.27	19	
4.2 Lifestyle.....77.36	20	
4.2.1 Environmental performance.....85.58	9	
4.2.2 Personal safety.....85.11	17	
4.2.3 Physician density.....47.18	38	
4.2.4 Sanitation.....91.58	65	

5 VOCATIONAL AND TECHNICAL SKILLS.....69.07	11	
5.1 Mid-Level Skills.....58.29	28	
5.1.1 Workforce with secondary education.....50.26	59	
5.1.2 Population with secondary education.....44.49	56	
5.1.3 Technicians and associate professionals.....49.37	43	
5.1.4 Labour productivity per employee.....89.06	3	
5.2 Employability.....79.85	8	
5.2.1 Ease of finding skilled employees.....80.65	12	
5.2.2 Relevance of education system to the economy.....85.63	5	
5.2.3 Skills matching with secondary education.....68.10	19	
5.2.4 Skills matching with tertiary education.....85.03	6	

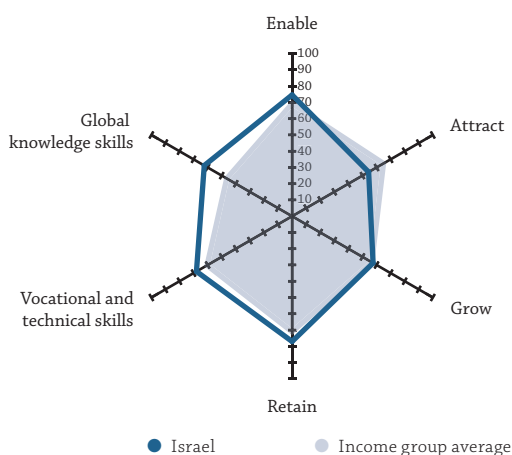
6 GLOBAL KNOWLEDGE SKILLS.....59.73	12	
6.1 High-Level Skills.....60.40	13	
6.1.1 Workforce with tertiary education.....70.77	7	
6.1.2 Population with tertiary education.....58.45	13	
6.1.3 Professionals.....61.37	14	
6.1.4 Researchers.....49.72	23	
6.1.5 Senior officials and managers.....53.10	22	
6.1.6 Availability of scientists and engineers.....69.00	26	
6.2 Talent Impact.....59.06	11	
6.2.1 Innovation output.....76.53	10	
6.2.2 High-value exports.....57.09	13	
6.2.3 New product entrepreneurial activity.....72.44	11	
6.2.4 New business density.....32.31	20	
6.2.5 Scientific journal articles.....56.94	16	

ISRAEL

Key Indicators

Rank (out of 132).....	20
Income group	High income
Regional group	Northern Africa and Western Asia
Population (millions)	8.88

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....74.62	19	
1.1 Regulatory Landscape.....	69.04	36
1.1.1 Government effectiveness	80.13	19
1.1.2 Rule of law	76.52	27
1.1.3 Political stability.....	45.71	110
1.1.4 Regulatory quality.....	79.30	22
1.1.5 Corruption	63.51	29
1.2 Market Landscape.....	82.34	6
1.2.1 Competition intensity.....	80.18	22
1.2.2 Ease of doing business.....	76.13	45
1.2.3 Cluster development.....	63.87	29
1.2.4 R&D expenditure.....	100.00	1
1.2.5 ICT infrastructure.....	82.57	17
1.2.6 Urban population.....	91.28	8
1.3 Business and Labour Landscape.....	72.49	15
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment	90.47	23
1.3.2 Active labour market policies	68.30	31
1.3.3 Labour-employer cooperation	64.00	25
1.3.4 Management Practice		
1.3.4 Professional management	81.97	18
1.3.5 Relationship of pay to productivity.....	69.64	21
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	95.65	5
1.3.7 Investment in emerging technologies	96.21	2
1.3.8 Robot density.....	13.65	29
2 ATTRACT.....54.38	48	
2.1 External Openness	62.36	23
2.1.1 Attract Business		
2.1.1 FDI and technology transfer	88.72	5
2.1.2 Prevalence of foreign ownership.....	75.26	29
2.1.3 Attract People		
2.1.3 Migrant stock	79.05	10
2.1.4 International students.....	10.11	62
2.1.5 Brain gain	58.67	32
2.2 Internal Openness.....	46.40	105
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	0.00	130
2.2.2 Tolerance of immigrants	20.55	118
2.2.3 Social mobility	75.92	26
2.2.4 Gender Equality		
2.2.4 Female graduates	n/a	n/a
2.2.5 Gender development gap	79.83	57
2.2.6 Leadership opportunities for women	55.72	49

GDP per capita (PPP US\$)	40,786.28
GDP (US\$ billions)	369.69
GTCI score.....	65.66
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....57.56	21	
3.1 Formal Education.....	41.28	36
3.1.1 Enrolment		
3.1.1 Vocational enrolment	30.46	37
3.1.2 Tertiary enrolment	49.26	41
3.1.3 Quality		
3.1.3 Tertiary education expenditure	21.42	62
3.1.4 Reading, maths, and science	62.42	36
3.1.5 University ranking.....	42.83	28
3.2 Lifelong Learning.....	54.91	38
3.2.1 Quality of management schools	77.19	14
3.2.2 Prevalence of training in firms.....	20.05	80
3.2.3 Employee development	67.48	21
3.3 Access to Growth Opportunities	76.48	13
3.3.1 Empowerment		
3.3.1 Delegation of authority	76.30	20
3.3.2 Personal rights	83.11	48
3.3.3 Collaboration		
3.3.3 Use of virtual social networks	99.07	2
3.3.4 Use of virtual professional networks	22.91	28
3.3.5 Collaboration within organisations.....	93.92	3
3.3.6 Collaboration across organisations.....	83.58	4

4 RETAIN.....77.07	21	
4.1 Sustainability	77.51	18
4.1.1 Pension system	100.00	1
4.1.2 Social protection.....	60.72	36
4.1.3 Brain retention	71.80	22
4.2 Lifestyle	76.63	23
4.2.1 Environmental performance	79.31	19
4.2.2 Personal safety	70.18	35
4.2.3 Physician density.....	57.04	20
4.2.4 Sanitation	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS.....67.95	12	
5.1 Mid-Level Skills	56.23	32
5.1.1 Workforce with secondary education	74.90	22
5.1.2 Population with secondary education	47.83	51
5.1.3 Technicians and associate professionals	55.91	32
5.1.4 Labour productivity per employee.....	46.30	31
5.2 Employability.....	79.67	9
5.2.1 Ease of finding skilled employees	92.36	2
5.2.2 Relevance of education system to the economy	64.76	25
5.2.3 Skills matching with secondary education	73.17	10
5.2.4 Skills matching with tertiary education.....	88.40	3

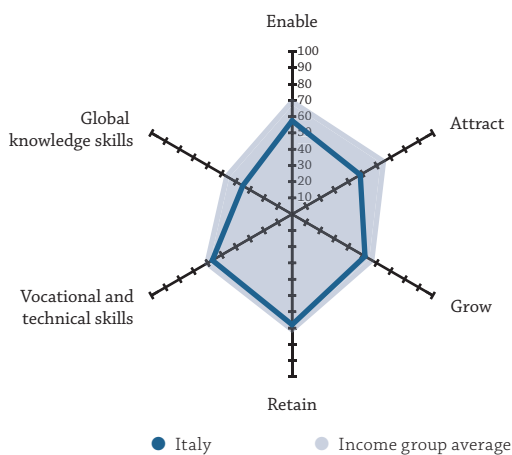
6 GLOBAL KNOWLEDGE SKILLS.....62.40	8	
6.1 High-Level Skills	73.20	2
6.1.1 Workforce with tertiary education	51.98	30
6.1.2 Population with tertiary education.....	75.58	5
6.1.3 Professionals	67.46	7
6.1.4 Researchers	100.00	1
6.1.5 Senior officials and managers	61.00	15
6.1.6 Availability of scientists and engineers.....	83.20	6
6.2 Talent Impact.....	51.60	17
6.2.1 Innovation output	79.16	7
6.2.2 High-value exports.....	41.22	22
6.2.3 New product entrepreneurial activity	66.00	15
6.2.4 New business density	16.51	35
6.2.5 Scientific journal articles	55.13	19

ITALY

Key Indicators

Rank (out of 132).....	36
Income group	High income
Regional group	Europe
Population (millions)	60.43

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....57.53 42		
1.1 Regulatory Landscape.....61.18	47	
1.1.1 Government effectiveness.....58.72	44	
1.1.2 Rule of law.....60.25	51	
1.1.3 Political stability.....70.22	54	
1.1.4 Regulatory quality.....65.37	38	
1.1.5 Corruption.....51.35	45	
1.2 Market Landscape.....67.88	24	
1.2.1 Competition intensity.....73.51	47	
1.2.2 Ease of doing business.....74.94	47	
1.2.3 Cluster development.....91.45	4	
1.2.4 R&D expenditure.....29.50	24	
1.2.5 ICT infrastructure.....71.88	40	
1.2.6 Urban population.....66.01	51	
1.3 Business and Labour Landscape.....43.53	73	
Labour Market		
1.3.1 Tertiary-educated unemployment.....80.55	64	
1.3.2 Active labour market policies.....30.19	94	
1.3.3 Labour-employer cooperation.....21.63	109	
Management Practice		
1.3.4 Professional management.....36.57	97	
1.3.5 Relationship of pay to productivity.....25.81	124	
Technology Adoption		
1.3.6 Technology utilisation.....53.33	59	
1.3.7 Investment in emerging technologies.....41.08	59	
1.3.8 Robot density.....59.11	8	
2 ATTRACT.....48.44 67		
2.1 External Openness.....41.08	72	
Attract Business		
2.1.1 FDI and technology transfer.....52.30	80	
2.1.2 Prevalence of foreign ownership.....51.60	88	
Attract People		
2.1.3 Migrant stock.....54.34	44	
2.1.4 International students.....18.66	36	
2.1.5 Brain gain.....28.49	104	
2.2 Internal Openness.....55.79	65	
Social Inclusion		
2.2.1 Tolerance of minorities.....56.67	48	
2.2.2 Tolerance of immigrants.....64.38	55	
2.2.3 Social mobility.....46.78	98	
Gender Equality		
2.2.4 Female graduates.....76.68	49	
2.2.5 Gender development gap.....77.11	68	
2.2.6 Leadership opportunities for women.....13.15	128	

GDP per capita (PPP US\$)	42,080.43
GDP (US\$ billions)	2,073.90
GTCI score.....	52.91
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....51.79 33		
3.1 Formal Education.....47.23	23	
Enrolment		
3.1.1 Vocational enrolment.....53.01	15	
3.1.2 Tertiary enrolment.....49.55	39	
Quality		
3.1.3 Tertiary education expenditure.....16.36	77	
3.1.4 Reading, maths, and science.....68.67	30	
3.1.5 University ranking.....48.55	19	
3.2 Lifelong Learning.....52.33	43	
3.2.1 Quality of management schools.....76.14	15	
3.2.2 Prevalence of training in firms.....n/a	n/a	
3.2.3 Employee development.....28.53	100	
3.3 Access to Growth Opportunities.....55.80	38	
Empowerment		
3.3.1 Delegation of authority.....34.16	100	
3.3.2 Personal rights.....96.02	19	
Collaboration		
3.3.3 Use of virtual social networks.....88.57	18	
3.3.4 Use of virtual professional networks.....36.18	18	
3.3.5 Collaboration within organisations.....41.05	91	
3.3.6 Collaboration across organisations.....38.83	70	

4 RETAIN.....67.96 28		
4.1 Sustainability.....57.92	40	
4.1.1 Pension system.....93.37	10	
4.1.2 Social protection.....51.53	46	
4.1.3 Brain retention.....28.87	99	
4.2 Lifestyle.....78.00	18	
4.2.1 Environmental performance.....82.56	16	
4.2.2 Personal safety.....66.03	40	
4.2.3 Physician density.....64.18	10	
4.2.4 Sanitation.....99.23	27	

5 VOCATIONAL AND TECHNICAL SKILLS.....56.67 33		
5.1 Mid-Level Skills.....60.38	23	
5.1.1 Workforce with secondary education.....61.91	34	
5.1.2 Population with secondary education.....48.49	48	
5.1.3 Technicians and associate professionals.....76.96	10	
5.1.4 Labour productivity per employee.....54.17	23	
5.2 Employability.....52.96	53	
5.2.1 Ease of finding skilled employees.....65.32	44	
5.2.2 Relevance of education system to the economy.....44.58	65	
5.2.3 Skills matching with secondary education.....45.45	59	
5.2.4 Skills matching with tertiary education.....56.50	59	

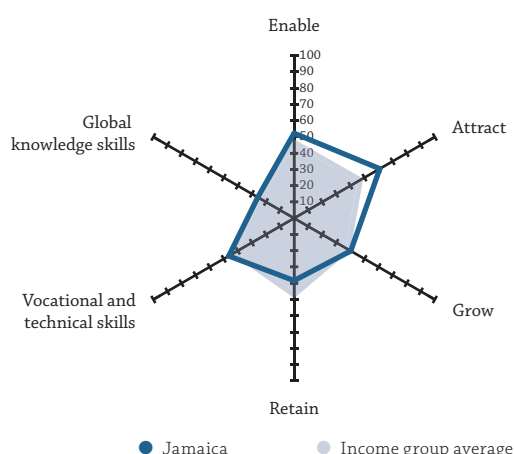
6 GLOBAL KNOWLEDGE SKILLS.....35.05 42		
6.1 High-Level Skills.....34.11	54	
6.1.1 Workforce with tertiary education.....32.74	58	
6.1.2 Population with tertiary education.....21.79	68	
6.1.3 Professionals.....39.12	42	
6.1.4 Researchers.....27.72	36	
6.1.5 Senior officials and managers.....21.67	66	
6.1.6 Availability of scientists and engineers.....61.64	40	
6.2 Talent Impact.....35.98	36	
6.2.1 Innovation output.....55.17	28	
6.2.2 High-value exports.....20.38	59	
6.2.3 New product entrepreneurial activity.....46.48	45	
6.2.4 New business density.....12.71	40	
6.2.5 Scientific journal articles.....45.17	24	

JAMAICA

Key Indicators

Rank (out of 132).....	57
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	2.93

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 52.29 51		
1.1 Regulatory Landscape.....	54.04	54
1.1.1 Government effectiveness.....	58.41	45
1.1.2 Rule of law.....	49.01	71
1.1.3 Political stability.....	70.60	53
1.1.4 Regulatory quality.....	51.65	63
1.1.5 Corruption.....	40.54	58
1.2 Market Landscape.....	56.33	50
1.2.1 Competition intensity.....	74.66	44
1.2.2 Ease of doing business.....	65.84	70
1.2.3 Cluster development.....	46.20	53
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	45.93	77
1.2.6 Urban population.....	49.03	87
1.3 Business and Labour Landscape.....	46.51	67
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	36.74	74
1.3.3 Labour-employer cooperation.....	41.59	56
1.3.4 Management Practice		
1.3.4.1 Professional management.....	66.84	30
1.3.5 Relationship of pay to productivity.....	42.40	80
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	53.41	58
1.3.7 Investment in emerging technologies.....	38.07	68
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT..... 60.89 32		
2.1 External Openness.....	49.11	47
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	70.73	37
2.1.2 Prevalence of foreign ownership.....	64.55	53
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	12.64	111
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	48.50	52
2.2 Internal Openness.....	72.67	20
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	80.00	11
2.2.2 Tolerance of immigrants.....	84.93	16
2.2.3 Social mobility.....	63.06	46
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	71.25	65
2.2.5 Gender development gap.....	84.65	35
2.2.6 Leadership opportunities for women.....	52.16	54

GDP per capita (PPP US\$).....	9,298.80
GDP (US\$ billions).....	15.72
GTCI score.....	44.00
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW..... 40.25 59		
3.1 Formal Education.....	14.58	92
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	20.78	86
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	22.96	54
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	49.45	51
3.2.1 Quality of management schools.....	66.57	30
3.2.2 Prevalence of training in firms.....	29.68	61
3.2.3 Employee development.....	52.11	38
3.3 Access to Growth Opportunities.....	56.72	36
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	65.78	28
3.3.2 Personal rights.....	89.52	37
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	80.60	49
3.3.4 Use of virtual professional networks.....	16.26	40
3.3.5 Collaboration within organisations.....	50.03	56
3.3.6 Collaboration across organisations.....	38.11	74

4 RETAIN..... 38.37 92		
4.1 Sustainability.....	32.65	95
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	28.30	104
4.1.3 Brain retention.....	36.99	76
4.2 Lifestyle.....	44.10	92
4.2.1 Environmental performance.....	51.93	67
4.2.2 Personal safety.....	32.93	103
4.2.3 Physician density.....	7.26	97
4.2.4 Sanitation.....	84.26	79

5 VOCATIONAL AND TECHNICAL SKILLS..... 46.42 57		
5.1 Mid-Level Skills.....	32.26	79
5.1.1 Workforce with secondary education.....	n/a	n/a
5.1.2 Population with secondary education.....	62.64	28
5.1.3 Technicians and associate professionals.....	23.81	85
5.1.4 Labour productivity per employee.....	10.33	86
5.2 Employability.....	60.57	37
5.2.1 Ease of finding skilled employees.....	65.19	46
5.2.2 Relevance of education system to the economy.....	58.46	40
5.2.3 Skills matching with secondary education.....	49.85	49
5.2.4 Skills matching with tertiary education.....	68.79	33

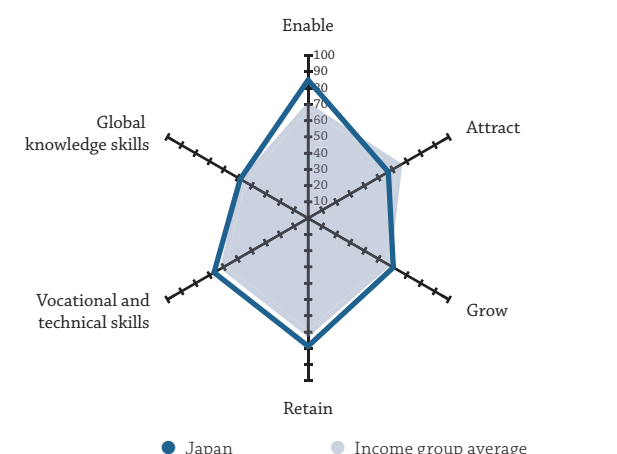
6 GLOBAL KNOWLEDGE SKILLS..... 25.79 69		
6.1 High-Level Skills.....	36.79	47
6.1.1 Workforce with tertiary education.....	n/a	n/a
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	22.77	74
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	43.35	31
6.1.6 Availability of scientists and engineers.....	44.26	75
6.2 Talent Impact.....	14.79	89
6.2.1 Innovation output.....	27.50	68
6.2.2 High-value exports.....	1.33	118
6.2.3 New product entrepreneurial activity.....	37.06	60
6.2.4 New business density.....	6.25	63
6.2.5 Scientific journal articles.....	1.80	84

JAPAN

Key Indicators

Rank (out of 132).....	19
Income group.....	High income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	126.53

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....85.03	8	
1.1 Regulatory Landscape.....85.23	15	
1.1.1 Government effectiveness.....85.74	12	
1.1.2 Rule of law.....89.24	17	
1.1.3 Political stability.....89.62	10	
1.1.4 Regulatory quality.....81.81	19	
1.1.5 Corruption.....79.73	17	
1.2 Market Landscape.....86.49	2	
1.2.1 Competition intensity.....100.00	1	
1.2.2 Ease of doing business.....80.46	36	
1.2.3 Cluster development.....87.60	6	
1.2.4 R&D expenditure.....69.93	5	
1.2.5 ICT infrastructure.....90.59	8	
1.2.6 Urban population.....90.36	10	
1.3 Business and Labour Landscape.....83.37	9	
Labour Market		
1.3.1 Tertiary-educated unemployment.....92.53	13	
1.3.2 Active labour market policies.....74.79	22	
1.3.3 Labour-employer cooperation.....86.21	5	
Management Practice		
1.3.4 Professional management.....84.69	16	
1.3.5 Relationship of pay to productivity.....65.84	31	
Technology Adoption		
1.3.6 Technology utilisation.....86.16	11	
1.3.7 Investment in emerging technologies.....79.99	9	
1.3.8 Robot density.....96.78	4	
2 ATTRACT.....57.02	40	
2.1 External Openness.....50.60	38	
Attract Business		
2.1.1 FDI and technology transfer.....82.67	14	
2.1.2 Prevalence of foreign ownership.....85.97	9	
Attract People		
2.1.3 Migrant stock.....21.41	99	
2.1.4 International students.....13.61	52	
2.1.5 Brain gain.....49.35	49	
2.2 Internal Openness.....63.44	46	
Social Inclusion		
2.2.1 Tolerance of minorities.....76.67	16	
2.2.2 Tolerance of immigrants.....50.68	82	
2.2.3 Social mobility.....75.56	27	
Gender Equality		
2.2.4 Female graduates.....53.95	88	
2.2.5 Gender development gap.....80.04	54	
2.2.6 Leadership opportunities for women.....43.77	72	

GDP per capita (PPP US\$).....	43,349.33
GDP (US\$ billions).....	4,970.92
GTCI score.....	66.06
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....60.56	20	
3.1 Formal Education.....50.08	20	
Enrolment		
3.1.1 Vocational enrolment.....17.69	62	
3.1.2 Tertiary enrolment.....n/a	n/a	
Quality		
3.1.3 Tertiary education expenditure.....13.64	88	
3.1.4 Reading, maths, and science.....89.33	2	
3.1.5 University ranking.....79.68	7	
3.2 Lifelong Learning.....65.75	24	
3.2.1 Quality of management schools.....53.30	50	
3.2.2 Prevalence of training in firms.....n/a	n/a	
3.2.3 Employee development.....78.21	11	
3.3 Access to Growth Opportunities.....65.86	23	
Empowerment		
3.3.1 Delegation of authority.....67.53	24	
3.3.2 Personal rights.....95.20	21	
Collaboration		
3.3.3 Use of virtual social networks.....87.95	21	
3.3.4 Use of virtual professional networks.....2.34	99	
3.3.5 Collaboration within organisations.....79.61	14	
3.3.6 Collaboration across organisations.....62.50	21	

4 RETAIN.....78.73	16	
4.1 Sustainability.....78.49	16	
4.1.1 Pension system.....100.00	1	
4.1.2 Social protection.....79.77	18	
4.1.3 Brain retention.....55.70	41	
4.2 Lifestyle.....78.97	17	
4.2.1 Environmental performance.....78.78	20	
4.2.2 Personal safety.....99.47	2	
4.2.3 Physician density.....37.65	51	
4.2.4 Sanitation.....100.00	1	

5 VOCATIONAL AND TECHNICAL SKILLS.....66.81	13	
5.1 Mid-Level Skills.....70.18	4	
5.1.1 Workforce with secondary education.....68.71	27	
5.1.2 Population with secondary education.....64.46	26	
5.1.3 Technicians and associate professionals.....100.00	1	
5.1.4 Labour productivity per employee.....47.55	27	
5.2 Employability.....63.45	33	
5.2.1 Ease of finding skilled employees.....68.61	39	
5.2.2 Relevance of education system to the economy.....63.32	30	
5.2.3 Skills matching with secondary education.....58.35	34	
5.2.4 Skills matching with tertiary education.....63.51	40	

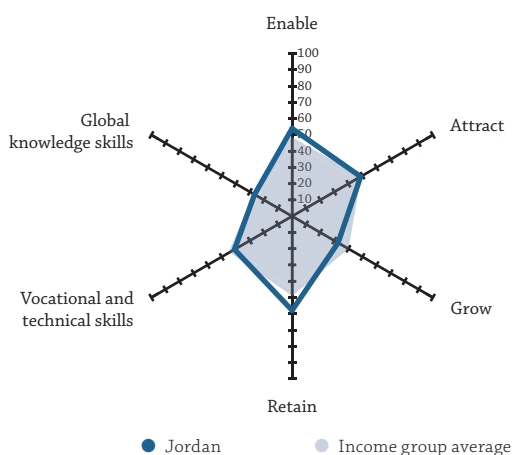
6 GLOBAL KNOWLEDGE SKILLS.....48.22	24	
6.1 High-Level Skills.....57.92	18	
6.1.1 Workforce with tertiary education.....73.89	5	
6.1.2 Population with tertiary education.....54.74	18	
6.1.3 Professionals.....n/a	n/a	
6.1.4 Researchers.....64.25	9	
6.1.5 Senior officials and managers.....10.77	91	
6.1.6 Availability of scientists and engineers.....85.93	4	
6.2 Talent Impact.....38.52	33	
6.2.1 Innovation output.....66.37	16	
6.2.2 High-value exports.....41.11	24	
6.2.3 New product entrepreneurial activity.....54.33	38	
6.2.4 New business density.....0.69	94	
6.2.5 Scientific journal articles.....30.10	34	

JORDAN

Key Indicators

Rank (out of 132).....	61
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	9.96

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....53.98 48		
1.1 Regulatory Landscape.....51.86 59		
1.1.1 Government effectiveness.....49.36 65		
1.1.2 Rule of law.....58.77 52		
1.1.3 Political stability.....53.42 94		
1.1.4 Regulatory quality.....50.45 65		
1.1.5 Corruption.....47.30 49		
1.2 Market Landscape.....59.75 37		
1.2.1 Competition intensity.....81.34 18		
1.2.2 Ease of doing business.....54.25 89		
1.2.3 Cluster development.....62.52 30		
1.2.4 R&D expenditure.....15.41 48		
1.2.5 ICT infrastructure.....55.34 68		
1.2.6 Urban population.....89.63 13		
1.3 Business and Labour Landscape.....50.34 53		
Labour Market		
1.3.1 Tertiary-educated unemployment.....n/a n/a		
1.3.2 Active labour market policies.....37.83 70		
1.3.3 Labour-employer cooperation.....51.72 39		
Management Practice		
1.3.4 Professional management.....42.06 85		
1.3.5 Relationship of pay to productivity.....57.21 49		
Technology Adoption		
1.3.6 Technology utilisation.....64.02 45		
1.3.7 Investment in emerging technologies.....49.20 45		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....48.71 65		
2.1 External Openness.....57.05 30		
Attract Business		
2.1.1 FDI and technology transfer.....60.14 59		
2.1.2 Prevalence of foreign ownership.....54.54 76		
Attract People		
2.1.3 Migrant stock.....77.69 12		
2.1.4 International students.....51.15 11		
2.1.5 Brain gain.....41.73 74		
2.2 Internal Openness.....40.36 120		
Social Inclusion		
2.2.1 Tolerance of minorities.....15.56 117		
2.2.2 Tolerance of immigrants.....43.84 96		
2.2.3 Social mobility.....49.11 91		
Gender Equality		
2.2.4 Female graduates.....46.93 99		
2.2.5 Gender development gap.....38.01 122		
2.2.6 Leadership opportunities for women.....48.71 60		

GDP per capita (PPP US\$).....	9,347.94
GDP (US\$ billions).....	42.29
GTGI score.....	43.48
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....32.69 86		
3.1 Formal Education.....17.48 86		
Enrolment		
3.1.1 Vocational enrolment.....5.33 96		
3.1.2 Tertiary enrolment.....24.62 80		
Quality		
3.1.3 Tertiary education expenditure.....13.99 84		
3.1.4 Reading, maths, and science.....28.22 60		
3.1.5 University ranking.....15.21 58		
3.2 Lifelong Learning.....31.59 108		
3.2.1 Quality of management schools.....49.43 60		
3.2.2 Prevalence of training in firms.....0.00 96		
3.2.3 Employee development.....45.34 57		
3.3 Access to Growth Opportunities.....49.01 56		
Empowerment		
3.3.1 Delegation of authority.....42.56 75		
3.3.2 Personal rights.....53.08 98		
Collaboration		
3.3.3 Use of virtual social networks.....85.90 27		
3.3.4 Use of virtual professional networks.....13.96 49		
3.3.5 Collaboration within organisations.....48.65 61		
3.3.6 Collaboration across organisations.....49.90 34		

4 RETAIN.....57.90 47		
4.1 Sustainability.....47.93 49		
4.1.1 Pension system.....51.50 53		
4.1.2 Social protection.....48.16 52		
4.1.3 Brain retention.....44.12 55		
4.2 Lifestyle.....67.86 39		
4.2.1 Environmental performance.....57.96 55		
4.2.2 Personal safety.....62.41 48		
4.2.3 Physician density.....54.63 25		
4.2.4 Sanitation.....96.46 46		

5 VOCATIONAL AND TECHNICAL SKILLS.....40.89 75		
5.1 Mid-Level Skills.....29.47 85		
5.1.1 Workforce with secondary education.....n/a n/a		
5.1.2 Population with secondary education.....34.70 68		
5.1.3 Technicians and associate professionals.....n/a n/a		
5.1.4 Labour productivity per employee.....24.24 61		
5.2 Employability.....52.31 56		
5.2.1 Ease of finding skilled employees.....66.11 43		
5.2.2 Relevance of education system to the economy.....52.37 49		
5.2.3 Skills matching with secondary education.....40.71 72		
5.2.4 Skills matching with tertiary education.....50.07 76		

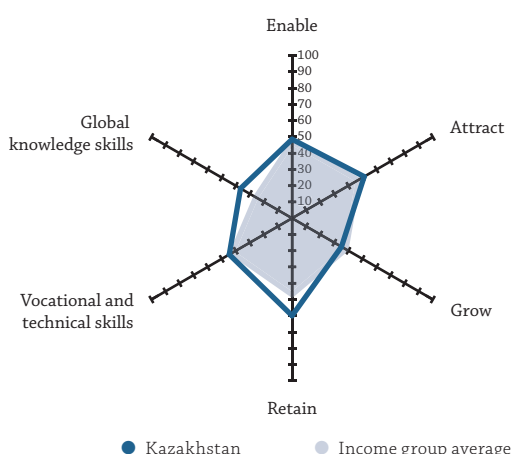
6 GLOBAL KNOWLEDGE SKILLS.....26.71 66		
6.1 High-Level Skills.....35.78 50		
6.1.1 Workforce with tertiary education.....n/a n/a		
6.1.2 Population with tertiary education.....24.80 64		
6.1.3 Professionals.....n/a n/a		
6.1.4 Researchers.....7.17 64		
6.1.5 Senior officials and managers.....n/a n/a		
6.1.6 Availability of scientists and engineers.....75.37 16		
6.2 Talent Impact.....17.63 79		
6.2.1 Innovation output.....27.50 68		
6.2.2 High-value exports.....5.36 101		
6.2.3 New product entrepreneurial activity.....45.65 46		
6.2.4 New business density.....2.84 79		
6.2.5 Scientific journal articles.....6.82 61		

KAZAKHSTAN

Key Indicators

Rank (out of 132).....	54
Income group.....	Upper-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	18.28

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	48.59	62
1.1 Regulatory Landscape.....	46.09	76
1.1.1 Government effectiveness.....	46.76	70
1.1.2 Rule of law.....	43.06	90
1.1.3 Political stability.....	65.37	66
1.1.4 Regulatory quality.....	52.27	61
1.1.5 Corruption.....	22.97	104
1.2 Market Landscape.....	48.30	73
1.2.1 Competition intensity.....	54.51	107
1.2.2 Ease of doing business.....	84.46	26
1.2.3 Cluster development.....	22.54	114
1.2.4 R&D expenditure.....	2.59	100
1.2.5 ICT infrastructure.....	74.68	36
1.2.6 Urban population.....	51.05	80
1.3 Business and Labour Landscape.....	51.39	50
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	87.87	38
1.3.2 Active labour market policies.....	58.69	41
1.3.3 Labour-employer cooperation.....	38.82	64
1.3.4 Management Practice		
1.3.4 Professional management.....	35.84	99
1.3.5 Relationship of pay to productivity.....	58.01	47
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	43.48	87
1.3.7 Investment in emerging technologies.....	37.04	72
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	51.23	58
2.1 External Openness.....	43.84	63
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	45.77	98
2.1.2 Prevalence of foreign ownership.....	45.32	102
2.1.3 Attract People		
2.1.3 Migrant stock.....	73.47	15
2.1.4 International students.....	8.03	67
2.1.5 Brain gain.....	46.62	56
2.2 Internal Openness.....	58.61	59
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	21.11	106
2.2.2 Tolerance of immigrants.....	47.95	85
2.2.3 Social mobility.....	60.08	53
2.2.4 Gender Equality		
2.2.4 Female graduates.....	68.58	72
2.2.5 Gender development gap.....	91.52	11
2.2.6 Leadership opportunities for women.....	62.43	36

GDP per capita (PPP US\$).....	27,830.59
GDP (US\$ billions).....	170.54
GTCI score.....	46.02
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	35.08	78
3.1 Formal Education.....	29.26	58
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	16.66	63
3.1.2 Tertiary enrolment.....	41.78	52
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	4.62	110
3.1.4 Reading, maths, and science.....	51.17	40
3.1.5 University ranking.....	32.08	38
3.2 Lifelong Learning.....	35.71	91
3.2.1 Quality of management schools.....	38.55	91
3.2.2 Prevalence of training in firms.....	32.85	54
3.2.3 Employee development.....	35.73	74
3.3 Access to Growth Opportunities.....	40.27	98
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	43.79	71
3.3.2 Personal rights.....	40.20	108
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	59.96	99
3.3.4 Use of virtual professional networks.....	3.55	93
3.3.5 Collaboration within organisations.....	49.84	57
3.3.6 Collaboration across organisations.....	44.29	49

4 RETAIN.....	59.96	39
4.1 Sustainability.....	59.05	36
4.1.1 Pension system.....	100.00	1
4.1.2 Social protection.....	41.09	70
4.1.3 Brain retention.....	36.05	79
4.2 Lifestyle.....	60.88	51
4.2.1 Environmental performance.....	45.22	85
4.2.2 Personal safety.....	48.47	80
4.2.3 Physician density.....	52.20	27
4.2.4 Sanitation.....	97.64	40

5 VOCATIONAL AND TECHNICAL SKILLS.....	44.63	62
5.1 Mid-Level Skills.....	46.33	56
5.1.1 Workforce with secondary education.....	53.51	51
5.1.2 Population with secondary education.....	45.56	54
5.1.3 Technicians and associate professionals.....	52.10	40
5.1.4 Labour productivity per employee.....	34.16	50
5.2 Employability.....	42.93	82
5.2.1 Ease of finding skilled employees.....	49.46	83
5.2.2 Relevance of education system to the economy.....	41.96	71
5.2.3 Skills matching with secondary education.....	41.93	69
5.2.4 Skills matching with tertiary education.....	38.36	111

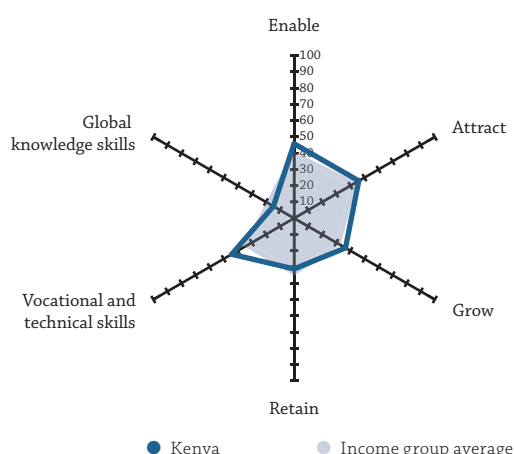
6 GLOBAL KNOWLEDGE SKILLS.....	36.63	39
6.1 High-Level Skills.....	43.77	38
6.1.1 Workforce with tertiary education.....	52.78	27
6.1.2 Population with tertiary education.....	84.30	2
6.1.3 Professionals.....	44.39	35
6.1.4 Researchers.....	7.90	62
6.1.5 Senior officials and managers.....	31.30	46
6.1.6 Availability of scientists and engineers.....	41.94	83
6.2 Talent Impact.....	29.50	50
6.2.1 Innovation output.....	20.84	90
6.2.2 High-value exports.....	67.60	9
6.2.3 New product entrepreneurial activity.....	44.83	48
6.2.4 New business density.....	10.77	46
6.2.5 Scientific journal articles.....	3.44	75

KENYA

Key Indicators

Rank (out of 132).....	88
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	51.39

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 45.84 80		
1.1 Regulatory Landscape.....	36.63	104
1.1.1 Government effectiveness.....	38.98	89
1.1.2 Rule of law.....	43.02	91
1.1.3 Political stability.....	41.21	117
1.1.4 Regulatory quality.....	42.38	88
1.1.5 Corruption.....	17.57	115
1.2 Market Landscape.....	43.64	83
1.2.1 Competition intensity.....	74.57	45
1.2.2 Ease of doing business.....	70.92	57
1.2.3 Cluster development.....	58.54	33
1.2.4 R&D expenditure.....	16.91	44
1.2.5 ICT infrastructure.....	24.81	106
1.2.6 Urban population.....	16.10	123
1.3 Business and Labour Landscape.....	57.25	38
Labour Market		
1.3.1 Tertiary-educated unemployment.....	74.26	86
1.3.2 Active labour market policies.....	38.16	69
1.3.3 Labour-employer cooperation.....	37.95	69
Management Practice		
1.3.4 Professional management.....	56.42	48
1.3.5 Relationship of pay to productivity.....	63.79	37
Technology Adoption		
1.3.6 Technology utilisation.....	70.07	32
1.3.7 Investment in emerging technologies.....	60.12	31
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT..... 45.96 80		
2.1 External Openness.....	43.99	62
Attract Business		
2.1.1 FDI and technology transfer.....	64.55	50
2.1.2 Prevalence of foreign ownership.....	63.84	54
Attract People		
2.1.3 Migrant stock.....	28.56	86
2.1.4 International students.....	3.16	83
2.1.5 Brain gain.....	59.86	30
2.2 Internal Openness.....	47.93	101
Social Inclusion		
2.2.1 Tolerance of minorities.....	15.56	117
2.2.2 Tolerance of immigrants.....	63.01	58
2.2.3 Social mobility.....	61.54	49
Gender Equality		
2.2.4 Female graduates.....	42.95	100
2.2.5 Gender development gap.....	64.38	98
2.2.6 Leadership opportunities for women.....	40.12	83

GDP per capita (PPP US\$).....	3,461.44
GDP (US\$ billions).....	87.91
GTCI score.....	36.42
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW..... 36.52 75		
3.1 Formal Education.....	5.98	121
Enrolment		
3.1.1 Vocational enrolment.....	0.69	115
3.1.2 Tertiary enrolment.....	8.67	103
Quality		
3.1.3 Tertiary education expenditure.....	14.56	82
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	51.96	45
3.2.1 Quality of management schools.....	59.98	38
3.2.2 Prevalence of training in firms.....	44.85	36
3.2.3 Employee development.....	51.06	42
3.3 Access to Growth Opportunities.....	51.62	47
Empowerment		
3.3.1 Delegation of authority.....	57.06	39
3.3.2 Personal rights.....	51.52	99
Collaboration		
3.3.3 Use of virtual social networks.....	80.79	47
3.3.4 Use of virtual professional networks.....	4.43	89
3.3.5 Collaboration within organisations.....	60.66	34
3.3.6 Collaboration across organisations.....	55.27	31

4 RETAIN..... 31.20 104		
4.1 Sustainability.....	38.03	74
4.1.1 Pension system.....	16.30	86
4.1.2 Social protection.....	41.55	69
4.1.3 Brain retention.....	56.23	39
4.2 Lifestyle.....	24.37	117
4.2.1 Environmental performance.....	33.04	103
4.2.2 Personal safety.....	36.98	97
4.2.3 Physician density.....	2.97	105
4.2.4 Sanitation.....	24.50	123

5 VOCATIONAL AND TECHNICAL SKILLS..... 44.32 64		
5.1 Mid-Level Skills.....	27.65	92
5.1.1 Workforce with secondary education.....	49.67	60
5.1.2 Population with secondary education.....	29.64	75
5.1.3 Technicians and associate professionals.....	n/a	n/a
5.1.4 Labour productivity per employee.....	3.64	100
5.2 Employability.....	61.00	36
5.2.1 Ease of finding skilled employees.....	76.37	19
5.2.2 Relevance of education system to the economy.....	62.51	32
5.2.3 Skills matching with secondary education.....	45.52	58
5.2.4 Skills matching with tertiary education.....	59.60	57

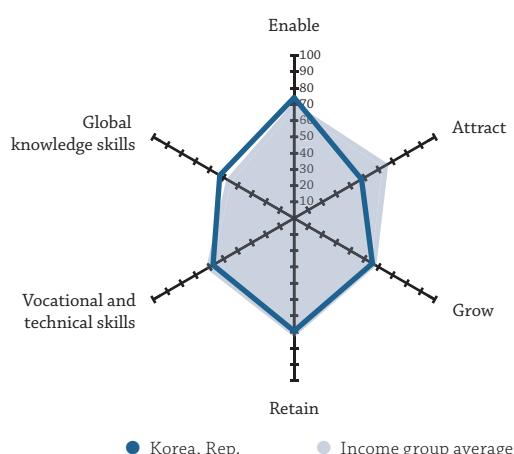
6 GLOBAL KNOWLEDGE SKILLS..... 14.70 103		
6.1 High-Level Skills.....	18.06	97
6.1.1 Workforce with tertiary education.....	5.35	117
6.1.2 Population with tertiary education.....	1.79	103
6.1.3 Professionals.....	n/a	n/a
6.1.4 Researchers.....	2.60	77
6.1.5 Senior officials and managers.....	n/a	n/a
6.1.6 Availability of scientists and engineers.....	62.51	37
6.2 Talent Impact.....	11.33	102
6.2.1 Innovation output.....	31.17	63
6.2.2 High-value exports.....	9.38	85
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	4.02	74
6.2.5 Scientific journal articles.....	0.76	101

KOREA, REP.

Key Indicators

Rank (out of 132).....	27
Income group.....	High income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	51.64

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....74.19	20	
1.1 Regulatory Landscape.....	71.46	30
1.1.1 Government effectiveness.....	72.78	27
1.1.2 Rule of law.....	79.83	22
1.1.3 Political stability.....	71.37	49
1.1.4 Regulatory quality.....	75.21	28
1.1.5 Corruption.....	58.11	39
1.2 Market Landscape.....	87.56	1
1.2.1 Competition intensity.....	94.58	3
1.2.2 Ease of doing business.....	95.62	4
1.2.3 Cluster development.....	65.73	28
1.2.4 R&D expenditure.....	99.50	2
1.2.5 ICT infrastructure.....	91.22	6
1.2.6 Urban population.....	78.68	29
1.3 Business and Labour Landscape.....	63.55	28
Labour Market		
1.3.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	69.76	29
1.3.3 Labour-employer cooperation.....	13.03	119
Management Practice		
1.3.4 Professional management.....	52.28	60
1.3.5 Relationship of pay to productivity.....	73.45	15
Technology Adoption		
1.3.6 Technology utilisation.....	76.83	21
1.3.7 Investment in emerging technologies.....	59.48	33
1.3.8 Robot density.....	100.00	1
2 ATTRACT.....47.92	71	
2.1 External Openness.....	41.82	70
Attract Business		
2.1.1 FDI and technology transfer.....	65.23	48
2.1.2 Prevalence of foreign ownership.....	53.63	82
Attract People		
2.1.3 Migrant stock.....	27.40	89
2.1.4 International students.....	7.00	71
2.1.5 Brain gain.....	55.83	37
2.2 Internal Openness.....	54.02	78
Social Inclusion		
2.2.1 Tolerance of minorities.....	81.11	9
2.2.2 Tolerance of immigrants.....	47.95	85
2.2.3 Social mobility.....	44.88	104
Gender Equality		
2.2.4 Female graduates.....	57.78	85
2.2.5 Gender development gap.....	64.69	97
2.2.6 Leadership opportunities for women.....	27.73	109

GDP per capita (PPP US\$).....	40,479.35
GDP (US\$ billions).....	1,619.42
GTCI score.....	59.59
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....55.65	25	
3.1 Formal Education.....	54.13	13
Enrolment		
3.1.1 Vocational enrolment.....	14.74	71
3.1.2 Tertiary enrolment.....	74.04	4
Quality		
3.1.3 Tertiary education expenditure.....	22.47	58
3.1.4 Reading, maths, and science.....	84.71	6
3.1.5 University ranking.....	74.68	8
3.2 Lifelong Learning.....	55.56	35
3.2.1 Quality of management schools.....	53.64	49
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	57.47	33
3.3 Access to Growth Opportunities.....	57.27	34
Empowerment		
3.3.1 Delegation of authority.....	39.48	85
3.3.2 Personal rights.....	94.05	27
Collaboration		
3.3.3 Use of virtual social networks.....	84.68	36
3.3.4 Use of virtual professional networks.....	5.84	76
3.3.5 Collaboration within organisations.....	58.98	37
3.3.6 Collaboration across organisations.....	60.61	25

4 RETAIN.....69.40	26	
4.1 Sustainability.....	66.67	26
4.1.1 Pension system.....	77.80	29
4.1.2 Social protection.....	54.00	43
4.1.3 Brain retention.....	68.21	25
4.2 Lifestyle.....	72.12	30
4.2.1 Environmental performance.....	58.13	53
4.2.2 Personal safety.....	93.48	5
4.2.3 Physician density.....	36.99	53
4.2.4 Sanitation.....	99.88	17

5 VOCATIONAL AND TECHNICAL SKILLS.....57.58	30	
5.1 Mid-Level Skills.....	55.65	33
5.1.1 Workforce with secondary education.....	52.23	54
5.1.2 Population with secondary education.....	50.42	43
5.1.3 Technicians and associate professionals.....	73.48	15
5.1.4 Labour productivity per employee.....	46.47	29
5.2 Employability.....	59.50	41
5.2.1 Ease of finding skilled employees.....	74.02	23
5.2.2 Relevance of education system to the economy.....	46.44	61
5.2.3 Skills matching with secondary education.....	56.22	39
5.2.4 Skills matching with tertiary education.....	61.31	48

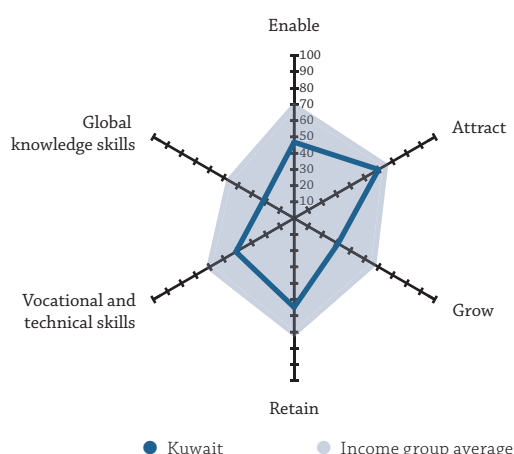
6 GLOBAL KNOWLEDGE SKILLS.....52.81	20	
6.1 High-Level Skills.....	58.79	16
6.1.1 Workforce with tertiary education.....	68.89	9
6.1.2 Population with tertiary education.....	64.45	9
6.1.3 Professionals.....	52.37	20
6.1.4 Researchers.....	91.07	4
6.1.5 Senior officials and managers.....	7.90	102
6.1.6 Availability of scientists and engineers.....	68.09	29
6.2 Talent Impact.....	46.83	25
6.2.1 Innovation output.....	71.45	13
6.2.2 High-value exports.....	42.23	20
6.2.3 New product entrepreneurial activity.....	59.30	25
6.2.4 New business density.....	12.39	42
6.2.5 Scientific journal articles.....	48.75	23

KUWAIT

Key Indicators

Rank (out of 132).....	63
Income group	High income
Regional group	Northern Africa and Western Asia
Population (millions)	4.14

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 46.79 74		
1.1 Regulatory Landscape..... 48.94 68		
1.1.1 Government effectiveness..... 42.50 84		
1.1.2 Rule of law..... 55.03 56		
1.1.3 Political stability..... 64.13 68		
1.1.4 Regulatory quality..... 46.56 72		
1.1.5 Corruption..... 36.49 63		
1.2 Market Landscape..... 54.01 57		
1.2.1 Competition intensity..... 47.80 121		
1.2.2 Ease of doing business..... 56.43 85		
1.2.3 Cluster development..... 49.17 47		
1.2.4 R&D expenditure..... 1.45 112		
1.2.5 ICT infrastructure..... 69.21 49		
1.2.6 Urban population..... 100.00 1		
1.3 Business and Labour Landscape..... 37.43 98		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... n/a n/a		
1.3.2 Active labour market policies..... 49.46 56		
1.3.3 Labour-employer cooperation..... 42.59 54		
1.3.4 Management Practice		
1.3.4 Professional management..... 32.35 105		
1.3.5 Relationship of pay to productivity..... 42.13 81		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 52.84 64		
1.3.7 Investment in emerging technologies..... 42.57 55		
1.3.8 Robot density..... 0.04 66		
2 ATTRACT..... 59.95 35		
2.1 External Openness..... 52.90 36		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 43.76 102		
2.1.2 Prevalence of foreign ownership..... 25.70 126		
2.1.3 Attract People		
2.1.3 Migrant stock..... 98.07 2		
2.1.4 International students..... n/a n/a		
2.1.5 Brain gain..... 44.08 65		
2.2 Internal Openness..... 67.00 33		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 65.56 34		
2.2.2 Tolerance of immigrants..... 75.34 30		
2.2.3 Social mobility..... 53.92 74		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 76.09 52		
2.2.5 Gender development gap..... 85.35 32		
2.2.6 Leadership opportunities for women..... 45.72 64		

GDP per capita (PPP US\$)	73,704.59
GDP (US\$ billions)	141.68
GTCI score.....	42.65
GTCI score (income group average)	61.46

	Score	Rank
3 GROW..... 31.22 95		
3.1 Formal Education..... 13.57 97		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... 3.67 102		
3.1.2 Tertiary enrolment..... 25.32 78		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... n/a n/a		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 11.71 66		
3.2 Lifelong Learning..... 35.29 92		
3.2.1 Quality of management schools..... 32.88 108		
3.2.2 Prevalence of training in firms..... n/a n/a		
3.2.3 Employee development..... 37.69 66		
3.3 Access to Growth Opportunities..... 44.82 76		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 38.40 89		
3.3.2 Personal rights..... 56.80 93		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 70.51 78		
3.3.4 Use of virtual professional networks..... 13.42 51		
3.3.5 Collaboration within organisations..... 43.55 83		
3.3.6 Collaboration across organisations..... 46.25 46		

4 RETAIN..... 54.80 53		
4.1 Sustainability..... 42.92 63		
4.1.1 Pension system..... 18.40 82		
4.1.2 Social protection..... 66.17 31		
4.1.3 Brain retention..... 44.19 54		
4.2 Lifestyle..... 66.69 41		
4.2.1 Environmental performance..... 58.09 54		
4.2.2 Personal safety..... 67.13 38		
4.2.3 Physician density..... 41.52 45		
4.2.4 Sanitation..... 100.00 1		

5 VOCATIONAL AND TECHNICAL SKILLS..... 41.35 74		
5.1 Mid-Level Skills..... 39.98 64		
5.1.1 Workforce with secondary education..... 27.15 94		
5.1.2 Population with secondary education..... 25.14 83		
5.1.3 Technicians and associate professionals..... 32.13 67		
5.1.4 Labour productivity per employee..... 75.49 8		
5.2 Employability..... 42.73 84		
5.2.1 Ease of finding skilled employees..... 51.25 79		
5.2.2 Relevance of education system to the economy..... 46.53 60		
5.2.3 Skills matching with secondary education..... 31.10 101		
5.2.4 Skills matching with tertiary education..... 42.02 101		

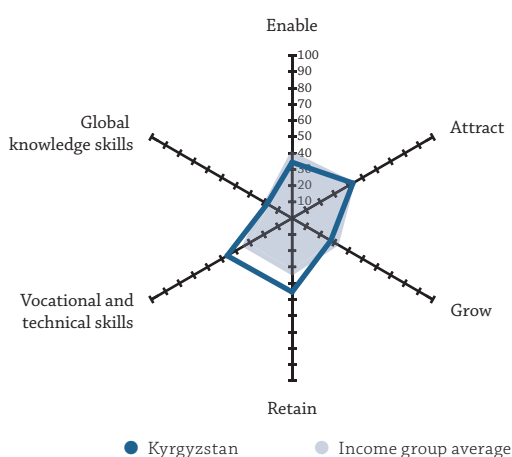
6 GLOBAL KNOWLEDGE SKILLS..... 21.78 78		
6.1 High-Level Skills..... 24.80 81		
6.1.1 Workforce with tertiary education..... 28.31 68		
6.1.2 Population with tertiary education..... 13.85 82		
6.1.3 Professionals..... 26.88 64		
6.1.4 Researchers..... 5.84 69		
6.1.5 Senior officials and managers..... 27.98 52		
6.1.6 Availability of scientists and engineers..... 45.95 71		
6.2 Talent Impact..... 18.76 76		
6.2.1 Innovation output..... 36.43 55		
6.2.2 High-value exports..... 12.50 81		
6.2.3 New product entrepreneurial activity..... n/a n/a		
6.2.4 New business density..... n/a n/a		
6.2.5 Scientific journal articles..... 7.36 58		

KYRGYZSTAN

Key Indicators

Rank (out of 132).....	91
Income group.....	Lower-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	6.32

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	34.43	113
1.1 Regulatory Landscape.....	35.11	106
1.1.1 Government effectiveness.....	29.22	114
1.1.2 Rule of law.....	31.06	118
1.1.3 Political stability.....	55.51	92
1.1.4 Regulatory quality.....	39.49	96
1.1.5 Corruption.....	20.27	107
1.2 Market Landscape.....	32.43	116
1.2.1 Competition intensity.....	48.56	118
1.2.2 Ease of doing business.....	67.38	65
1.2.3 Cluster development.....	13.36	128
1.2.4 R&D expenditure.....	2.07	106
1.2.5 ICT infrastructure.....	36.39	92
1.2.6 Urban population.....	26.81	113
1.3 Business and Labour Landscape.....	35.74	104
Labour Market		
1.3.1 Tertiary-educated unemployment.....	75.41	80
1.3.2 Active labour market policies.....	30.44	92
1.3.3 Labour-employer cooperation.....	29.38	91
Management Practice		
1.3.4 Professional management.....	23.60	124
1.3.5 Relationship of pay to productivity.....	55.63	52
Technology Adoption		
1.3.6 Technology utilisation.....	16.39	125
1.3.7 Investment in emerging technologies.....	19.32	119
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	43.21	94
2.1 External Openness.....	29.91	111
Attract Business		
2.1.1 FDI and technology transfer.....	20.95	128
2.1.2 Prevalence of foreign ownership.....	40.38	113
Attract People		
2.1.3 Migrant stock.....	41.29	63
2.1.4 International students.....	23.43	33
2.1.5 Brain gain.....	23.51	113
2.2 Internal Openness.....	56.51	62
Social Inclusion		
2.2.1 Tolerance of minorities.....	21.11	106
2.2.2 Tolerance of immigrants.....	60.27	60
2.2.3 Social mobility.....	49.83	90
Gender Equality		
2.2.4 Female graduates.....	79.63	35
2.2.5 Gender development gap.....	74.67	79
2.2.6 Leadership opportunities for women.....	53.52	51

GDP per capita (PPP US\$).....	3,877.86
GDP (US\$ billions).....	8.09
GTCI score.....	35.72
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	27.49	110
3.1 Formal Education.....	12.10	102
Enrolment		
3.1.1 Vocational enrolment.....	12.37	78
3.1.2 Tertiary enrolment.....	34.14	66
Quality		
3.1.3 Tertiary education expenditure.....	1.91	115
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	38.92	78
3.2.1 Quality of management schools.....	18.75	128
3.2.2 Prevalence of training in firms.....	78.23	6
3.2.3 Employee development.....	19.79	123
3.3 Access to Growth Opportunities.....	31.46	119
Empowerment		
3.3.1 Delegation of authority.....	23.81	120
3.3.2 Personal rights.....	59.64	89
Collaboration		
3.3.3 Use of virtual social networks.....	34.04	128
3.3.4 Use of virtual professional networks.....	1.11	111
3.3.5 Collaboration within organisations.....	44.27	81
3.3.6 Collaboration across organisations.....	25.87	105

4 RETAIN.....	45.38	72
4.1 Sustainability.....	34.41	88
4.1.1 Pension system.....	51.94	52
4.1.2 Social protection.....	30.72	95
4.1.3 Brain retention.....	20.57	115
4.2 Lifestyle.....	56.36	60
4.2.1 Environmental performance.....	45.72	83
4.2.2 Personal safety.....	53.95	66
4.2.3 Physician density.....	29.43	61
4.2.4 Sanitation.....	96.33	47

5 VOCATIONAL AND TECHNICAL SKILLS.....	46.11	59
5.1 Mid-Level Skills.....	59.60	25
5.1.1 Workforce with secondary education.....	100.00	1
5.1.2 Population with secondary education.....	100.00	1
5.1.3 Technicians and associate professionals.....	33.68	61
5.1.4 Labour productivity per employee.....	4.71	99
5.2 Employability.....	32.63	116
5.2.1 Ease of finding skilled employees.....	39.58	108
5.2.2 Relevance of education system to the economy.....	32.56	96
5.2.3 Skills matching with secondary education.....	29.28	108
5.2.4 Skills matching with tertiary education.....	29.09	125

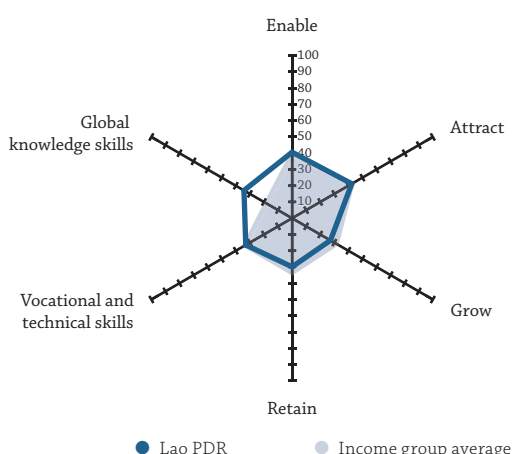
6 GLOBAL KNOWLEDGE SKILLS.....	17.70	89
6.1 High-Level Skills.....	23.35	85
6.1.1 Workforce with tertiary education.....	26.91	72
6.1.2 Population with tertiary education.....	27.17	61
6.1.3 Professionals.....	24.02	71
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	8.22	101
6.1.6 Availability of scientists and engineers.....	30.41	114
6.2 Talent Impact.....	12.05	99
6.2.1 Innovation output.....	15.59	108
6.2.2 High-value exports.....	25.92	47
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	6.08	65
6.2.5 Scientific journal articles.....	0.62	102

LAO PDR

Key Indicators

Rank (out of 132).....	98
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	7.06

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	40.62	95
1.1 Regulatory Landscape.....	39.00	95
1.1.1 Government effectiveness.....	37.84	93
1.1.2 Rule of law.....	32.08	117
1.1.3 Political stability.....	74.45	41
1.1.4 Regulatory quality.....	30.38	113
1.1.5 Corruption.....	20.27	107
1.2 Market Landscape.....	34.41	112
1.2.1 Competition intensity.....	41.71	126
1.2.2 Ease of doing business.....	36.89	119
1.2.3 Cluster development.....	45.39	54
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	22.77	110
1.2.6 Urban population.....	25.26	116
1.3 Business and Labour Landscape.....	48.44	58
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	77.30	72
1.3.2 Active labour market policies.....	31.98	83
1.3.3 Labour-employer cooperation.....	45.25	52
1.3.4 Management Practice		
1.3.4 Professional management.....	40.17	91
1.3.5 Relationship of pay to productivity.....	58.00	48
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	40.00	97
1.3.7 Investment in emerging technologies.....	46.40	50
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	42.39	97
2.1 External Openness.....	33.54	100
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	51.24	84
2.1.2 Prevalence of foreign ownership.....	54.24	77
2.1.3 Attract People		
2.1.3 Migrant stock.....	15.33	108
2.1.4 International students.....	1.46	96
2.1.5 Brain gain.....	45.45	63
2.2 Internal Openness.....	51.23	92
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	36.67	81
2.2.2 Tolerance of immigrants.....	35.62	102
2.2.3 Social mobility.....	56.70	68
2.2.4 Gender Equality		
2.2.4 Female graduates.....	52.91	90
2.2.5 Gender development gap.....	65.23	94
2.2.6 Leadership opportunities for women.....	60.26	42

GDP per capita (PPP US\$).....	7,441.28
GDP (US\$ billions).....	18.13
GTCI score.....	34.54
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	27.26	111
3.1 Formal Education.....	5.17	123
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	1.52	112
3.1.2 Tertiary enrolment.....	11.90	99
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	7.25	101
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	34.27	100
3.2.1 Quality of management schools.....	40.68	86
3.2.2 Prevalence of training in firms.....	27.70	67
3.2.3 Employee development.....	34.42	79
3.3 Access to Growth Opportunities.....	42.34	89
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	42.45	76
3.3.2 Personal rights.....	11.55	126
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	59.85	100
3.3.4 Use of virtual professional networks.....	n/a	n/a
3.3.5 Collaboration within organisations.....	49.41	59
3.3.6 Collaboration across organisations.....	48.43	38

4 RETAIN.....	29.90	107
4.1 Sustainability.....	27.25	106
4.1.1 Pension system.....	1.60	115
4.1.2 Social protection.....	30.98	94
4.1.3 Brain retention.....	49.18	47
4.2 Lifestyle.....	32.55	103
4.2.1 Environmental performance.....	25.85	116
4.2.2 Personal safety.....	26.28	118
4.2.3 Physician density.....	7.57	95
4.2.4 Sanitation.....	70.51	94

5 VOCATIONAL AND TECHNICAL SKILLS.....	32.91	100
5.1 Mid-Level Skills.....	18.63	106
5.1.1 Workforce with secondary education.....	26.67	97
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	10.60	111
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	47.19	72
5.2.1 Ease of finding skilled employees.....	47.46	91
5.2.2 Relevance of education system to the economy.....	50.49	55
5.2.3 Skills matching with secondary education.....	28.94	110
5.2.4 Skills matching with tertiary education.....	61.86	46

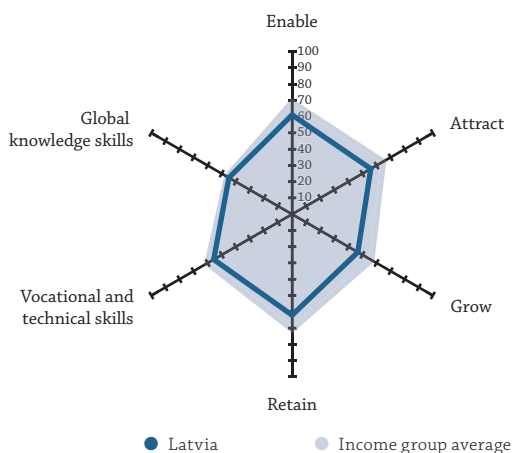
6 GLOBAL KNOWLEDGE SKILLS.....	34.19	48
6.1 High-Level Skills.....	34.44	53
6.1.1 Workforce with tertiary education.....	18.68	87
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	20.00	77
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	66.66	9
6.1.6 Availability of scientists and engineers.....	32.41	110
6.2 Talent Impact.....	33.95	42
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	100.00	1
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	1.39	92
6.2.5 Scientific journal articles.....	0.45	108

LATVIA

Key Indicators

Rank (out of 132).....	33
Income group	High income
Regional group	Europe
Population (millions)	1.93

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	61.10	35
1.1 Regulatory Landscape.....	70.78	32
1.1.1 Government effectiveness.....	68.47	33
1.1.2 Rule of law.....	74.41	31
1.1.3 Political stability.....	75.12	40
1.1.4 Regulatory quality.....	76.42	27
1.1.5 Corruption.....	59.46	36
1.2 Market Landscape.....	59.24	41
1.2.1 Competition intensity.....	78.36	32
1.2.2 Ease of doing business.....	87.50	17
1.2.3 Cluster development.....	42.37	69
1.2.4 R&D expenditure.....	10.94	62
1.2.5 ICT infrastructure.....	72.90	38
1.2.6 Urban population.....	63.37	58
1.3 Business and Labour Landscape.....	53.29	47
Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.02	37
1.3.2 Active labour market policies.....	56.13	46
1.3.3 Labour-employer cooperation.....	51.14	41
Management Practice		
1.3.4 Professional management.....	55.95	51
1.3.5 Relationship of pay to productivity.....	61.34	44
Technology Adoption		
1.3.6 Technology utilisation.....	67.45	35
1.3.7 Investment in emerging technologies.....	44.86	52
1.3.8 Robot density.....	1.45	47
2 ATTRACT.....	55.92	43
2.1 External Openness.....	49.73	43
Attract Business		
2.1.1 FDI and technology transfer.....	62.09	55
2.1.2 Prevalence of foreign ownership.....	69.50	41
Attract People		
2.1.3 Migrant stock.....	63.70	27
2.1.4 International students.....	28.10	27
2.1.5 Brain gain.....	25.25	109
2.2 Internal Openness.....	62.10	48
Social Inclusion		
2.2.1 Tolerance of minorities.....	16.67	111
2.2.2 Tolerance of immigrants.....	12.33	125
2.2.3 Social mobility.....	69.05	34
Gender Equality		
2.2.4 Female graduates.....	94.78	7
2.2.5 Gender development gap.....	99.48	2
2.2.6 Leadership opportunities for women.....	80.32	13

GDP per capita (PPP US\$)	28,362.01
GDP (US\$ billions)	34.85
GTCI score.....	54.40
GTCI score (income group average)	61.46

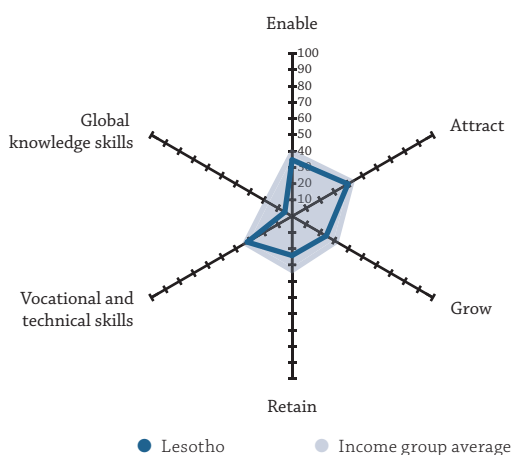
	Score	Rank
3 GROW.....	46.70	39
3.1 Formal Education.....	42.17	35
Enrolment		
3.1.1 Vocational enrolment.....	31.46	36
3.1.2 Tertiary enrolment.....	69.49	9
Quality		
3.1.3 Tertiary education expenditure.....	27.21	40
3.1.4 Reading, maths, and science.....	69.49	29
3.1.5 University ranking.....	13.18	63
3.2 Lifelong Learning.....	44.63	64
3.2.1 Quality of management schools.....	56.34	45
3.2.2 Prevalence of training in firms.....	28.76	64
3.2.3 Employee development.....	48.79	49
3.3 Access to Growth Opportunities.....	53.31	42
Empowerment		
3.3.1 Delegation of authority.....	53.14	46
3.3.2 Personal rights.....	94.47	25
Collaboration		
3.3.3 Use of virtual social networks.....	79.82	52
3.3.4 Use of virtual professional networks.....	15.44	44
3.3.5 Collaboration within organisations.....	43.11	85
3.3.6 Collaboration across organisations.....	33.86	80
4 RETAIN.....	62.09	38
4.1 Sustainability.....	55.75	42
4.1.1 Pension system.....	92.59	11
4.1.2 Social protection.....	46.20	58
4.1.3 Brain retention.....	28.44	101
4.2 Lifestyle.....	68.43	38
4.2.1 Environmental performance.....	64.49	35
4.2.2 Personal safety.....	65.75	41
4.2.3 Physician density.....	51.15	30
4.2.4 Sanitation.....	92.32	64
5 VOCATIONAL AND TECHNICAL SKILLS.....	55.68	35
5.1 Mid-Level Skills.....	63.26	18
5.1.1 Workforce with secondary education.....	75.22	21
5.1.2 Population with secondary education.....	80.79	8
5.1.3 Technicians and associate professionals.....	59.66	27
5.1.4 Labour productivity per employee.....	37.37	46
5.2 Employability.....	48.10	68
5.2.1 Ease of finding skilled employees.....	47.28	92
5.2.2 Relevance of education system to the economy.....	46.70	59
5.2.3 Skills matching with secondary education.....	42.62	64
5.2.4 Skills matching with tertiary education.....	55.82	63
6 GLOBAL KNOWLEDGE SKILLS.....	44.91	28
6.1 High-Level Skills.....	44.71	35
6.1.1 Workforce with tertiary education.....	53.95	26
6.1.2 Population with tertiary education.....	50.19	28
6.1.3 Professionals.....	44.31	36
6.1.4 Researchers.....	21.55	42
6.1.5 Senior officials and managers.....	61.44	14
6.1.6 Availability of scientists and engineers.....	36.84	97
6.2 Talent Impact.....	45.10	26
6.2.1 Innovation output.....	50.44	33
6.2.2 High-value exports.....	55.16	15
6.2.3 New product entrepreneurial activity.....	55.84	33
6.2.4 New business density.....	38.68	19
6.2.5 Scientific journal articles.....	25.39	38

LESOTHO

Key Indicators

Rank (out of 132).....	119
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	2.11

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....34.67 110		
1.1 Regulatory Landscape.....	41.68	88
1.1.1 Government effectiveness.....	25.93	119
1.1.2 Rule of law.....	46.25	79
1.1.3 Political stability.....	59.57	77
1.1.4 Regulatory quality.....	40.19	94
1.1.5 Corruption.....	36.49	63
1.2 Market Landscape.....	35.73	107
1.2.1 Competition intensity.....	81.94	16
1.2.2 Ease of doing business.....	53.57	91
1.2.3 Cluster development.....	34.81	87
1.2.4 R&D expenditure.....	0.73	115
1.2.5 ICT infrastructure.....	25.95	105
1.2.6 Urban population.....	17.39	121
1.3 Business and Labour Landscape.....	26.61	122
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	56.18	45
1.3.3 Labour-employer cooperation.....	3.13	129
1.3.4 Management Practice		
1.3.4 Professional management.....	26.01	122
1.3.5 Relationship of pay to productivity.....	35.70	104
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	2.77	130
1.3.7 Investment in emerging technologies.....	35.86	76
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....39.64 108		
2.1 External Openness.....	19.01	130
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	18.96	130
2.1.2 Prevalence of foreign ownership.....	25.15	127
2.1.3 Attract People		
2.1.3 Migrant stock.....	8.17	121
2.1.4 International students.....	1.09	100
2.1.5 Brain gain.....	41.66	75
2.2 Internal Openness.....	60.28	54
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	74.44	20
2.2.2 Tolerance of immigrants.....	60.27	60
2.2.3 Social mobility.....	41.23	116
2.2.4 Gender Equality		
2.2.4 Female graduates.....	82.55	29
2.2.5 Gender development gap.....	90.33	15
2.2.6 Leadership opportunities for women.....	12.83	129

GDP per capita (PPP US\$).....	3,223.02
GDP (US\$ billions).....	2.79
GTCI score.....	26.62
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....24.25 121		
3.1 Formal Education.....	4.69	125
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	3.18	105
3.1.2 Tertiary enrolment.....	6.63	111
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	8.94	100
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	43.36	66
3.2.1 Quality of management schools.....	66.71	29
3.2.2 Prevalence of training in firms.....	36.68	49
3.2.3 Employee development.....	26.70	105
3.3 Access to Growth Opportunities.....	24.70	128
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	17.58	127
3.3.2 Personal rights.....	62.71	86
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	0.00	132
3.3.4 Use of virtual professional networks.....	2.07	103
3.3.5 Collaboration within organisations.....	25.72	127
3.3.6 Collaboration across organisations.....	40.12	63

4 RETAIN.....24.16 115		
4.1 Sustainability.....	27.20	107
4.1.1 Pension system.....	3.80	110
4.1.2 Social protection.....	33.19	86
4.1.3 Brain retention.....	44.62	52
4.2 Lifestyle.....	21.11	123
4.2.1 Environmental performance.....	10.59	125
4.2.2 Personal safety.....	13.23	125
4.2.3 Physician density.....	n/a	n/a
4.2.4 Sanitation.....	39.51	112

5 VOCATIONAL AND TECHNICAL SKILLS.....31.82 102		
5.1 Mid-Level Skills.....	22.86	97
5.1.1 Workforce with secondary education.....	35.30	81
5.1.2 Population with secondary education.....	15.71	102
5.1.3 Technicians and associate professionals.....	17.57	98
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	40.77	91
5.2.1 Ease of finding skilled employees.....	36.56	112
5.2.2 Relevance of education system to the economy.....	39.39	82
5.2.3 Skills matching with secondary education.....	22.33	121
5.2.4 Skills matching with tertiary education.....	64.81	39

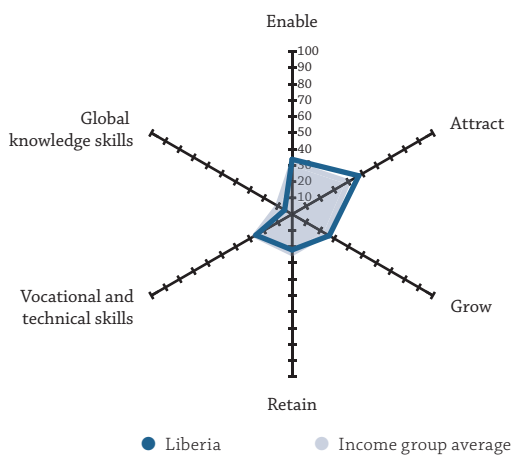
6 GLOBAL KNOWLEDGE SKILLS.....5.16 130		
6.1 High-Level Skills.....	7.54	129
6.1.1 Workforce with tertiary education.....	5.87	115
6.1.2 Population with tertiary education.....	1.31	106
6.1.3 Professionals.....	2.16	125
6.1.4 Researchers.....	0.15	105
6.1.5 Senior officials and managers.....	6.76	104
6.1.6 Availability of scientists and engineers.....	28.97	116
6.2 Talent Impact.....	2.79	126
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	0.57	122
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	7.41	59
6.2.5 Scientific journal articles.....	0.40	111

LIBERIA

Key Indicators

Rank (out of 132).....	118
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	4.82

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....33.78 116		
1.1 Regulatory Landscape.....29.73 119		
1.1.1 Government effectiveness.....13.33 129		
1.1.2 Rule of law.....30.11 119		
1.1.3 Political stability.....56.00 91		
1.1.4 Regulatory quality.....24.86 122		
1.1.5 Corruption.....24.32 100		
1.2 Market Landscape.....36.02 104		
1.2.1 Competition intensity.....43.43 125		
1.2.2 Ease of doing business.....23.04 128		
1.2.3 Cluster development.....33.78 92		
1.2.4 R&D expenditure.....n/a n/a		
1.2.5 ICT infrastructure.....n/a n/a		
1.2.6 Urban population.....43.83 93		
1.3 Business and Labour Landscape.....35.58 105		
Labour Market		
1.3.1 Tertiary-educated unemployment.....73.36 88		
1.3.2 Active labour market policies.....26.65 101		
1.3.3 Labour-employer cooperation.....25.53 101		
Management Practice		
1.3.4 Professional management.....46.43 73		
1.3.5 Relationship of pay to productivity.....41.77 83		
Technology Adoption		
1.3.6 Technology utilisation.....12.64 128		
1.3.7 Investment in emerging technologies.....22.71 114		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....47.32 73		
2.1 External Openness.....49.14 46		
Attract Business		
2.1.1 FDI and technology transfer.....34.36 121		
2.1.2 Prevalence of foreign ownership.....79.75 22		
Attract People		
2.1.3 Migrant stock.....31.16 81		
2.1.4 International students.....n/a n/a		
2.1.5 Brain gain.....51.27 43		
2.2 Internal Openness.....45.51 108		
Social Inclusion		
2.2.1 Tolerance of minorities.....53.33 50		
2.2.2 Tolerance of immigrants.....57.53 69		
2.2.3 Social mobility.....57.47 64		
Gender Equality		
2.2.4 Female graduates.....24.99 107		
2.2.5 Gender development gap.....34.03 125		
2.2.6 Leadership opportunities for women.....45.70 65		

GDP per capita (PPP US\$).....	1,306.32
GDP (US\$ billions).....	3.25
GTCI score.....	26.74
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....26.42 113		
3.1 Formal Education.....9.82 110		
Enrolment		
3.1.1 Vocational enrolment.....11.38 83		
3.1.2 Tertiary enrolment.....8.67 102		
Quality		
3.1.3 Tertiary education expenditure.....19.24 70		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....28.22 120		
3.2.1 Quality of management schools.....25.39 120		
3.2.2 Prevalence of training in firms.....25.59 71		
3.2.3 Employee development.....33.67 81		
3.3 Access to Growth Opportunities.....41.23 93		
Empowerment		
3.3.1 Delegation of authority.....40.75 82		
3.3.2 Personal rights.....77.99 60		
Collaboration		
3.3.3 Use of virtual social networks.....52.32 112		
3.3.4 Use of virtual professional networks.....1.71 106		
3.3.5 Collaboration within organisations.....44.72 76		
3.3.6 Collaboration across organisations.....29.87 92		

4 RETAIN.....21.94 120		
4.1 Sustainability.....22.54 113		
4.1.1 Pension system.....0.26 118		
4.1.2 Social protection.....29.39 100		
4.1.3 Brain retention.....37.97 75		
4.2 Lifestyle.....21.33 122		
4.2.1 Environmental performance.....23.65 120		
4.2.2 Personal safety.....51.04 71		
4.2.3 Physician density.....0.06 124		
4.2.4 Sanitation.....10.56 129		

5 VOCATIONAL AND TECHNICAL SKILLS.....25.70 120		
5.1 Mid-Level Skills.....14.05 114		
5.1.1 Workforce with secondary education.....23.99 102		
5.1.2 Population with secondary education.....n/a n/a		
5.1.3 Technicians and associate professionals.....4.11 124		
5.1.4 Labour productivity per employee.....n/a n/a		
5.2 Employability.....37.35 99		
5.2.1 Ease of finding skilled employees.....44.40 97		
5.2.2 Relevance of education system to the economy.....35.26 90		
5.2.3 Skills matching with secondary education.....23.73 120		
5.2.4 Skills matching with tertiary education.....46.02 89		

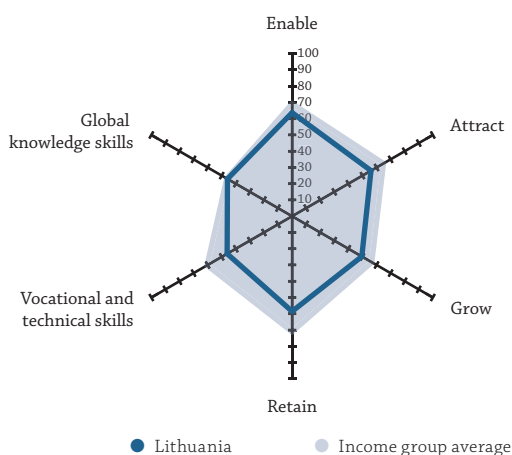
6 GLOBAL KNOWLEDGE SKILLS.....5.28 129		
6.1 High-Level Skills.....10.51 121		
6.1.1 Workforce with tertiary education.....4.96 118		
6.1.2 Population with tertiary education.....n/a n/a		
6.1.3 Professionals.....15.70 94		
6.1.4 Researchers.....n/a n/a		
6.1.5 Senior officials and managers.....5.93 107		
6.1.6 Availability of scientists and engineers.....15.45 129		
6.2 Talent Impact.....0.05 132		
6.2.1 Innovation output.....n/a n/a		
6.2.2 High-value exports.....n/a n/a		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....0.00 107		
6.2.5 Scientific journal articles.....0.10 126		

LITHUANIA

Key Indicators

Rank (out of 132).....	35
Income group.....	High income
Regional group.....	Europe
Population (millions).....	2.79

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....63.70	31	
1.1 Regulatory Landscape.....	73.10	27
1.1.1 Government effectiveness.....	70.25	31
1.1.2 Rule of law.....	75.84	30
1.1.3 Political stability.....	82.15	29
1.1.4 Regulatory quality.....	76.46	26
1.1.5 Corruption.....	60.81	33
1.2 Market Landscape.....	59.16	42
1.2.1 Competition intensity.....	79.69	24
1.2.2 Ease of doing business.....	89.71	12
1.2.3 Cluster development.....	34.42	91
1.2.4 R&D expenditure.....	19.25	39
1.2.5 ICT infrastructure.....	69.08	50
1.2.6 Urban population.....	62.84	60
1.3 Business and Labour Landscape.....	58.82	34
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	90.87	21
1.3.2 Active labour market policies.....	60.09	39
1.3.3 Labour-employer cooperation.....	47.53	47
1.3.4 Management Practice		
1.3.4 Professional management.....	64.81	34
1.3.5 Relationship of pay to productivity.....	63.53	38
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	78.08	19
1.3.7 Investment in emerging technologies.....	61.76	28
1.3.8 Robot density.....	3.88	43
2 ATTRACT.....56.06	42	
2.1 External Openness.....	42.95	68
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	75.02	24
2.1.2 Prevalence of foreign ownership.....	57.62	66
2.1.3 Attract People		
2.1.3 Migrant stock.....	40.03	65
2.1.4 International students.....	15.01	48
2.1.5 Brain gain.....	27.08	106
2.2 Internal Openness.....	69.17	27
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	68.89	29
2.2.2 Tolerance of immigrants.....	27.40	110
2.2.3 Social mobility.....	67.34	37
2.2.4 Gender Equality		
2.2.4 Female graduates.....	86.64	20
2.2.5 Gender development gap.....	98.07	3
2.2.6 Leadership opportunities for women.....	66.70	28

GDP per capita (PPP US\$).....	33,252.68
GDP (US\$ billions).....	53.25
GTCI score.....	53.32
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....49.54	35	
3.1 Formal Education.....	36.55	40
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	15.02	69
3.1.2 Tertiary enrolment.....	56.00	26
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	27.11	41
3.1.4 Reading, maths, and science.....	64.15	34
3.1.5 University ranking.....	20.47	50
3.2 Lifelong Learning.....	51.05	46
3.2.1 Quality of management schools.....	40.83	85
3.2.2 Prevalence of training in firms.....	50.92	29
3.2.3 Employee development.....	61.41	28
3.3 Access to Growth Opportunities.....	61.03	28
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	62.31	31
3.3.2 Personal rights.....	94.43	26
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	90.19	13
3.3.4 Use of virtual professional networks.....	11.56	54
3.3.5 Collaboration within organisations.....	60.42	35
3.3.6 Collaboration across organisations.....	47.25	44

4 RETAIN.....58.55	46	
4.1 Sustainability.....	43.01	62
4.1.1 Pension system.....	76.00	31
4.1.2 Social protection.....	29.94	98
4.1.3 Brain retention.....	23.10	108
4.2 Lifestyle.....	74.10	29
4.2.1 Environmental performance.....	69.84	28
4.2.2 Personal safety.....	63.49	46
4.2.3 Physician density.....	69.92	6
4.2.4 Sanitation.....	93.14	60

5 VOCATIONAL AND TECHNICAL SKILLS.....46.15	58	
5.1 Mid-Level Skills.....	56.67	31
5.1.1 Workforce with secondary education.....	70.36	25
5.1.2 Population with secondary education.....	73.35	16
5.1.3 Technicians and associate professionals.....	41.41	52
5.1.4 Labour productivity per employee.....	41.57	39
5.2 Employability.....	35.63	107
5.2.1 Ease of finding skilled employees.....	33.83	117
5.2.2 Relevance of education system to the economy.....	36.11	86
5.2.3 Skills matching with secondary education.....	26.35	112
5.2.4 Skills matching with tertiary education.....	46.22	87

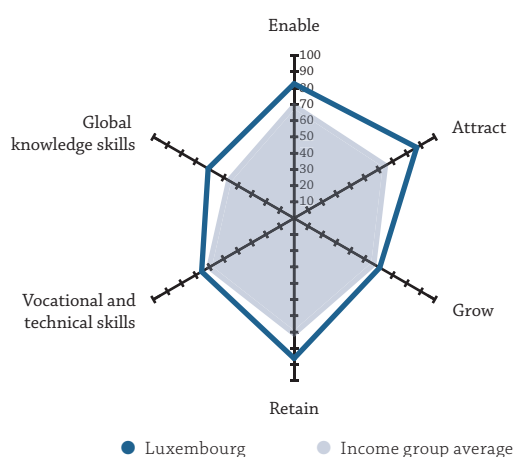
6 GLOBAL KNOWLEDGE SKILLS.....45.93	26	
6.1 High-Level Skills.....	55.02	22
6.1.1 Workforce with tertiary education.....	65.59	12
6.1.2 Population with tertiary education.....	53.85	22
6.1.3 Professionals.....	61.42	13
6.1.4 Researchers.....	36.44	28
6.1.5 Senior officials and managers.....	56.46	18
6.1.6 Availability of scientists and engineers.....	56.38	51
6.2 Talent Impact.....	36.83	35
6.2.1 Innovation output.....	45.36	39
6.2.2 High-value exports.....	34.28	34
6.2.3 New product entrepreneurial activity.....	58.42	27
6.2.4 New business density.....	15.99	37
6.2.5 Scientific journal articles.....	30.11	33

LUXEMBOURG

Key Indicators

Rank (out of 132).....	8
Income group.....	High income
Regional group.....	Europe
Population (millions).....	0.61

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....82.74	9	
1.1 Regulatory Landscape.....	91.02	10
1.1.1 Government effectiveness.....	87.34	11
1.1.2 Rule of law.....	93.24	11
1.1.3 Political stability.....	94.37	4
1.1.4 Regulatory quality.....	89.60	12
1.1.5 Corruption.....	90.54	9
1.2 Market Landscape.....	73.20	17
1.2.1 Competition intensity.....	75.29	42
1.2.2 Ease of doing business.....	68.60	61
1.2.3 Cluster development.....	78.49	12
1.2.4 R&D expenditure.....	27.18	29
1.2.5 ICT infrastructure.....	100.00	1
1.2.6 Urban population.....	89.63	12
1.3 Business and Labour Landscape.....	83.99	7
Labour Market		
1.3.1 Tertiary-educated unemployment.....	86.09	47
1.3.2 Active labour market policies.....	91.11	5
1.3.3 Labour-employer cooperation.....	83.05	7
Management Practice		
1.3.4 Professional management.....	88.74	13
1.3.5 Relationship of pay to productivity.....	70.48	19
Technology Adoption		
1.3.6 Technology utilisation.....	88.90	9
1.3.7 Investment in emerging technologies.....	79.58	10
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....87.10	2	
2.1 External Openness.....	94.26	2
Attract Business		
2.1.1 FDI and technology transfer.....	91.33	4
2.1.2 Prevalence of foreign ownership.....	100.00	1
Attract People		
2.1.3 Migrant stock.....	88.46	6
2.1.4 International students.....	100.00	1
2.1.5 Brain gain.....	91.53	5
2.2 Internal Openness.....	79.93	12
Social Inclusion		
2.2.1 Tolerance of minorities.....	81.11	9
2.2.2 Tolerance of immigrants.....	90.41	10
2.2.3 Social mobility.....	92.83	6
Gender Equality		
2.2.4 Female graduates.....	59.59	83
2.2.5 Gender development gap.....	77.99	63
2.2.6 Leadership opportunities for women.....	77.64	16

GDP per capita (PPP US\$).....	111,908.04
GDP (US\$ billions).....	69.49
GTCI score.....	73.94
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....60.83	19	
3.1 Formal Education.....	28.82	60
Enrolment		
3.1.1 Vocational enrolment.....	51.26	16
3.1.2 Tertiary enrolment.....	14.96	93
Quality		
3.1.3 Tertiary education expenditure.....	10.01	96
3.1.4 Reading, maths, and science.....	67.88	31
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	77.01	11
3.2.1 Quality of management schools.....	63.92	34
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	90.11	3
3.3 Access to Growth Opportunities.....	76.64	11
Empowerment		
3.3.1 Delegation of authority.....	81.78	16
3.3.2 Personal rights.....	96.49	15
Collaboration		
3.3.3 Use of virtual social networks.....	86.06	25
3.3.4 Use of virtual professional networks.....	45.18	14
3.3.5 Collaboration within organisations.....	81.41	13
3.3.6 Collaboration across organisations.....	68.91	13

4 RETAIN.....86.22	4	
4.1 Sustainability.....	95.81	2
4.1.1 Pension system.....	100.00	1
4.1.2 Social protection.....	99.11	3
4.1.3 Brain retention.....	88.32	5
4.2 Lifestyle.....	76.63	24
4.2.1 Environmental performance.....	86.16	7
4.2.2 Personal safety.....	76.37	26
4.2.3 Physician density.....	46.54	39
4.2.4 Sanitation.....	97.43	43

5 VOCATIONAL AND TECHNICAL SKILLS.....65.68	16	
5.1 Mid-Level Skills.....	63.53	17
5.1.1 Workforce with secondary education.....	43.62	69
5.1.2 Population with secondary education.....	50.84	42
5.1.3 Technicians and associate professionals.....	77.19	9
5.1.4 Labour productivity per employee.....	82.46	4
5.2 Employability.....	67.83	25
5.2.1 Ease of finding skilled employees.....	59.11	58
5.2.2 Relevance of education system to the economy.....	64.15	26
5.2.3 Skills matching with secondary education.....	71.18	13
5.2.4 Skills matching with tertiary education.....	76.90	24

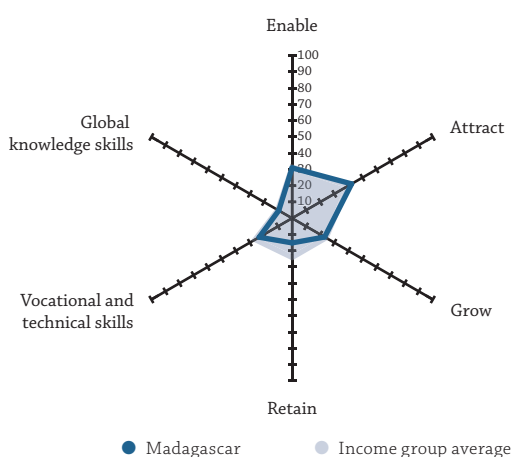
6 GLOBAL KNOWLEDGE SKILLS.....61.06	11	
6.1 High-Level Skills.....	57.22	19
6.1.1 Workforce with tertiary education.....	67.80	11
6.1.2 Population with tertiary education.....	54.54	21
6.1.3 Professionals.....	100.00	1
6.1.4 Researchers.....	56.70	15
6.1.5 Senior officials and managers.....	11.51	89
6.1.6 Availability of scientists and engineers.....	52.76	56
6.2 Talent Impact.....	64.91	3
6.2.1 Innovation output.....	74.96	11
6.2.2 High-value exports.....	19.99	60
6.2.3 New product entrepreneurial activity.....	100.00	1
6.2.4 New business density.....	73.91	7
6.2.5 Scientific journal articles.....	55.68	18

MADAGASCAR

Key Indicators

Rank (out of 132).....	126
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	26.26

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	30.99	122
1.1 Regulatory Landscape.....	31.03	117
1.1.1 Government effectiveness.....	18.96	126
1.1.2 Rule of law.....	32.62	114
1.1.3 Political stability.....	57.68	86
1.1.4 Regulatory quality.....	31.05	111
1.1.5 Corruption.....	14.86	120
1.2 Market Landscape.....	25.08	126
1.2.1 Competition intensity.....	60.60	86
1.2.2 Ease of doing business.....	32.65	124
1.2.3 Cluster development.....	21.66	117
1.2.4 R&D expenditure.....	0.00	118
1.2.5 ICT infrastructure.....	7.76	125
1.2.6 Urban population.....	27.78	109
1.3 Business and Labour Landscape.....	36.86	99
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	72.17	90
1.3.2 Active labour market policies.....	13.18	119
1.3.3 Labour-employer cooperation.....	30.12	90
1.3.4 Management Practice		
1.3.4 Professional management.....	32.78	104
1.3.5 Relationship of pay to productivity.....	31.60	114
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	44.29	83
1.3.7 Investment in emerging technologies.....	33.88	85
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	42.28	98
2.1 External Openness.....	30.12	110
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	46.90	95
2.1.2 Prevalence of foreign ownership.....	55.18	73
2.1.3 Attract People		
2.1.3 Migrant stock.....	3.71	128
2.1.4 International students.....	5.99	75
2.1.5 Brain gain.....	38.83	84
2.2 Internal Openness.....	54.44	73
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	72.22	25
2.2.2 Tolerance of immigrants.....	46.58	90
2.2.3 Social mobility.....	45.32	102
2.2.4 Gender Equality		
2.2.4 Female graduates.....	50.44	93
2.2.5 Gender development gap.....	75.46	75
2.2.6 Leadership opportunities for women.....	36.62	91

GDP per capita (PPP US\$).....	1,634.16
GDP (US\$ billions).....	12.10
GTCI score.....	24.06
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....	23.11	127
3.1 Formal Education.....	2.02	131
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	3.30	104
3.1.2 Tertiary enrolment.....	3.22	121
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	1.56	116
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	28.31	119
3.2.1 Quality of management schools.....	45.58	72
3.2.2 Prevalence of training in firms.....	12.27	91
3.2.3 Employee development.....	27.09	103
3.3 Access to Growth Opportunities.....	38.98	102
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	32.32	107
3.3.2 Personal rights.....	68.09	78
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	57.61	105
3.3.4 Use of virtual professional networks.....	0.19	122
3.3.5 Collaboration within organisations.....	43.28	84
3.3.6 Collaboration across organisations.....	32.39	86

4 RETAIN.....	15.17	129
4.1 Sustainability.....	15.47	126
4.1.1 Pension system.....	6.20	101
4.1.2 Social protection.....	13.24	125
4.1.3 Brain retention.....	26.97	104
4.2 Lifestyle.....	14.87	131
4.2.1 Environmental performance.....	10.50	126
4.2.2 Personal safety.....	44.18	88
4.2.3 Physician density.....	1.99	110
4.2.4 Sanitation.....	2.81	131

5 VOCATIONAL AND TECHNICAL SKILLS.....	23.36	123
5.1 Mid-Level Skills.....	7.29	123
5.1.1 Workforce with secondary education.....	18.63	108
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	2.77	126
5.1.4 Labour productivity per employee.....	0.46	110
5.2 Employability.....	39.44	93
5.2.1 Ease of finding skilled employees.....	53.00	71
5.2.2 Relevance of education system to the economy.....	29.29	103
5.2.3 Skills matching with secondary education.....	29.48	107
5.2.4 Skills matching with tertiary education.....	45.99	90

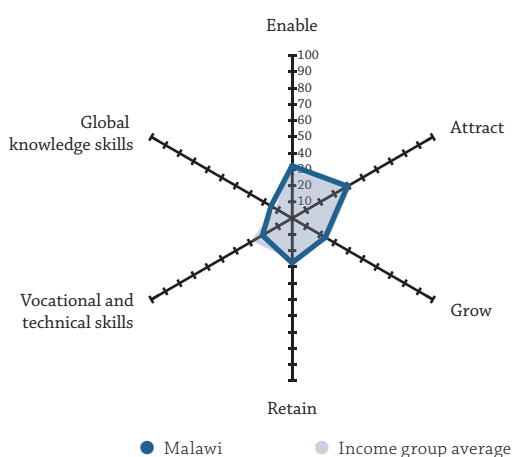
6 GLOBAL KNOWLEDGE SKILLS.....	9.48	121
6.1 High-Level Skills.....	10.99	119
6.1.1 Workforce with tertiary education.....	6.38	114
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	4.48	121
6.1.4 Researchers.....	0.24	102
6.1.5 Senior officials and managers.....	2.77	120
6.1.6 Availability of scientists and engineers.....	41.07	86
6.2 Talent Impact.....	7.96	114
6.2.1 Innovation output.....	15.94	104
6.2.2 High-value exports.....	1.60	116
6.2.3 New product entrepreneurial activity.....	21.86	80
6.2.4 New business density.....	0.30	102
6.2.5 Scientific journal articles.....	0.12	124

MALAWI

Key Indicators

Rank (out of 132).....	120
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	18.14

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	32.30	118
1.1 Regulatory Landscape.....	37.48	102
1.1.1 Government effectiveness.....	30.31	112
1.1.2 Rule of law.....	44.02	87
1.1.3 Political stability.....	59.04	82
1.1.4 Regulatory quality.....	29.72	115
1.1.5 Corruption.....	24.32	100
1.2 Market Landscape.....	28.56	122
1.2.1 Competition intensity.....	56.30	105
1.2.2 Ease of doing business.....	51.77	95
1.2.3 Cluster development.....	23.87	109
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	6.36	126
1.2.6 Urban population.....	4.49	131
1.3 Business and Labour Landscape.....	30.86	118
Labour Market		
1.3.1 Tertiary-educated unemployment.....	53.30	108
1.3.2 Active labour market policies.....	19.79	112
1.3.3 Labour-employer cooperation.....	22.98	106
Management Practice		
1.3.4 Professional management.....	45.07	79
1.3.5 Relationship of pay to productivity.....	37.93	96
Technology Adoption		
1.3.6 Technology utilisation.....	17.15	124
1.3.7 Investment in emerging technologies.....	19.79	117
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	39.29	110
2.1 External Openness.....	34.07	97
Attract Business		
2.1.1 FDI and technology transfer.....	32.22	124
2.1.2 Prevalence of foreign ownership.....	64.88	52
Attract People		
2.1.3 Migrant stock.....	27.04	90
2.1.4 International students.....	4.08	80
2.1.5 Brain gain.....	42.14	72
2.2 Internal Openness.....	44.50	111
Social Inclusion		
2.2.1 Tolerance of minorities.....	52.22	55
2.2.2 Tolerance of immigrants.....	34.25	105
2.2.3 Social mobility.....	44.25	106
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	66.04	92
2.2.6 Leadership opportunities for women.....	25.74	112

GDP per capita (PPP US\$).....	1,308.68
GDP (US\$ billions).....	7.06
GTGI score.....	26.44
GTGI score (income group average).....	26.01

	Score	Rank
3 GROW.....	23.54	125
3.1 Formal Education.....	8.37	118
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	0.00	126
Quality		
3.1.3 Tertiary education expenditure.....	25.10	49
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	31.03	109
3.2.1 Quality of management schools.....	23.58	124
3.2.2 Prevalence of training in firms.....	38.92	44
3.2.3 Employee development.....	30.57	94
3.3 Access to Growth Opportunities.....	31.24	120
Empowerment		
3.3.1 Delegation of authority.....	40.86	81
3.3.2 Personal rights.....	67.52	79
Collaboration		
3.3.3 Use of virtual social networks.....	34.00	129
3.3.4 Use of virtual professional networks.....	0.56	119
3.3.5 Collaboration within organisations.....	27.07	126
3.3.6 Collaboration across organisations.....	17.44	125

4 RETAIN.....	27.47	112
4.1 Sustainability.....	20.83	117
4.1.1 Pension system.....	4.33	106
4.1.2 Social protection.....	21.21	116
4.1.3 Brain retention.....	36.94	77
4.2 Lifestyle.....	34.11	101
4.2.1 Environmental performance.....	36.31	101
4.2.2 Personal safety.....	60.90	51
4.2.3 Physician density.....	0.00	127
4.2.4 Sanitation.....	39.23	113

5 VOCATIONAL AND TECHNICAL SKILLS.....	21.06	129
5.1 Mid-Level Skills.....	6.29	125
5.1.1 Workforce with secondary education.....	18.87	107
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	0.00	127
5.1.4 Labour productivity per employee.....	0.00	112
5.2 Employability.....	35.83	106
5.2.1 Ease of finding skilled employees.....	48.55	86
5.2.2 Relevance of education system to the economy.....	33.15	94
5.2.3 Skills matching with secondary education.....	19.23	125
5.2.4 Skills matching with tertiary education.....	42.39	99

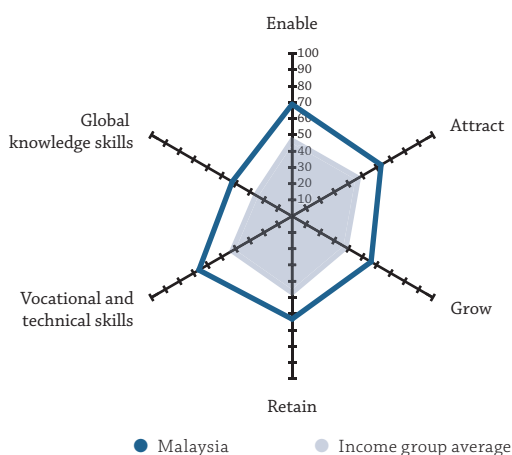
6 GLOBAL KNOWLEDGE SKILLS.....	14.97	101
6.1 High-Level Skills.....	8.95	127
6.1.1 Workforce with tertiary education.....	1.18	123
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	6.90	116
6.1.4 Researchers.....	0.46	92
6.1.5 Senior officials and managers.....	1.49	124
6.1.6 Availability of scientists and engineers.....	34.73	107
6.2 Talent Impact.....	20.98	68
6.2.1 Innovation output.....	15.59	108
6.2.2 High-value exports.....	33.15	36
6.2.3 New product entrepreneurial activity.....	55.39	35
6.2.4 New business density.....	0.35	101
6.2.5 Scientific journal articles.....	0.43	110

MALAYSIA

Key Indicators

Rank (out of 132).....	26
Income group.....	Upper-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	31.53

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 68.88 26		
1.1 Regulatory Landscape..... 61.44 45		
1.1.1 Government effectiveness..... 66.86 36		
1.1.2 Rule of law..... 62.34 46		
1.1.3 Political stability..... 68.55 58		
1.1.4 Regulatory quality..... 64.86 39		
1.1.5 Corruption..... 44.59 52		
1.2 Market Landscape..... 71.29 22		
1.2.1 Competition intensity..... 82.52 15		
1.2.2 Ease of doing business..... 89.30 13		
1.2.3 Cluster development..... 85.51 7		
1.2.4 R&D expenditure..... 31.20 23		
1.2.5 ICT infrastructure..... 66.79 54		
1.2.6 Urban population..... 72.44 41		
1.3 Business and Labour Landscape..... 73.90 13		
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment..... 86.74 41		
1.3.2 Active labour market policies..... 81.15 11		
1.3.3 Labour-employer cooperation..... 74.04 14		
1.3.4 Management Practice		
1.3.4.1 Professional management..... 83.63 17		
1.3.5 Relationship of pay to productivity..... 87.37 4		
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation..... 84.09 14		
1.3.7 Investment in emerging technologies..... 78.89 12		
1.3.8 Robot density..... 15.32 26		
2 ATTRACT..... 63.21 28		
2.1 External Openness..... 65.04 19		
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer..... 84.98 9		
2.1.2 Prevalence of foreign ownership..... 74.96 31		
2.1.3 Attract People		
2.1.3.1 Migrant stock..... 55.93 41		
2.1.4 International students..... 29.56 24		
2.1.5 Brain gain..... 79.75 10		
2.2 Internal Openness..... 61.39 52		
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities..... 44.44 68		
2.2.2 Tolerance of immigrants..... 9.59 126		
2.2.3 Social mobility..... 77.27 23		
2.2.4 Gender Equality		
2.2.4.1 Female graduates..... 75.07 53		
2.2.5 Gender development gap..... 80.18 53		
2.2.6 Leadership opportunities for women..... 81.78 10		

GDP per capita (PPP US\$).....	31,698.37
GDP (US\$ billions).....	354.35
GTCI score.....	60.04
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW..... 56.12 23		
3.1 Formal Education..... 35.76 42		
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment..... 20.75 55		
3.1.2 Tertiary enrolment..... 32.76 67		
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure..... 22.48 57		
3.1.4 Reading, maths, and science..... 47.44 42		
3.1.5 University ranking..... 55.38 16		
3.2 Lifelong Learning..... 59.94 28		
3.2.1 Quality of management schools..... 75.44 17		
3.2.2 Prevalence of training in firms..... 19.92 81		
3.2.3 Employee development..... 84.46 4		
3.3 Access to Growth Opportunities..... 72.67 19		
3.3.1 Empowerment		
3.3.1.1 Delegation of authority..... 82.28 15		
3.3.2 Personal rights..... 69.64 76		
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks..... 86.57 24		
3.3.4 Use of virtual professional networks..... 22.98 27		
3.3.5 Collaboration within organisations..... 85.27 11		
3.3.6 Collaboration across organisations..... 89.30 3		

4 RETAIN..... 63.26 34		
4.1 Sustainability..... 66.33 28		
4.1.1 Pension system..... 43.20 59		
4.1.2 Social protection..... 74.93 21		
4.1.3 Brain retention..... 80.86 9		
4.2 Lifestyle..... 60.18 53		
4.2.1 Environmental performance..... 52.99 65		
4.2.2 Personal safety..... 63.93 44		
4.2.3 Physician density..... 24.28 73		
4.2.4 Sanitation..... 99.54 20		

5 VOCATIONAL AND TECHNICAL SKILLS..... 66.21 15		
5.1 Mid-Level Skills..... 49.39 50		
5.1.1 Workforce with secondary education..... 58.69 39		
5.1.2 Population with secondary education..... 55.22 36		
5.1.3 Technicians and associate professionals..... 44.40 48		
5.1.4 Labour productivity per employee..... 39.27 42		
5.2 Employability..... 83.02 6		
5.2.1 Ease of finding skilled employees..... 87.27 4		
5.2.2 Relevance of education system to the economy..... 81.11 7		
5.2.3 Skills matching with secondary education..... 80.22 6		
5.2.4 Skills matching with tertiary education..... 83.48 12		

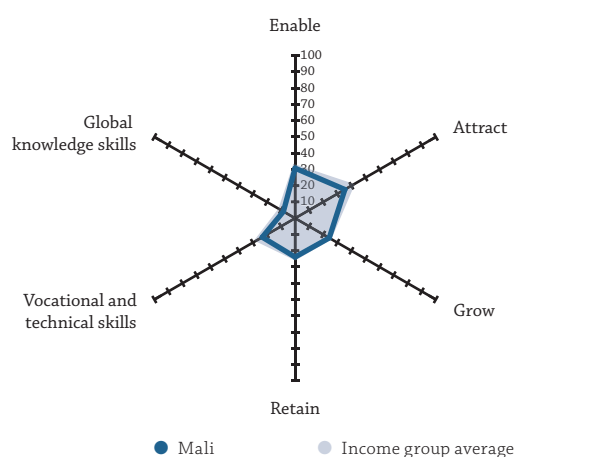
6 GLOBAL KNOWLEDGE SKILLS..... 42.54 33		
6.1 High-Level Skills..... 40.21 42		
6.1.1 Workforce with tertiary education..... 35.03 56		
6.1.2 Population with tertiary education..... 29.17 58		
6.1.3 Professionals..... 32.05 54		
6.1.4 Researchers..... 28.49 35		
6.1.5 Senior officials and managers..... 27.60 55		
6.1.6 Availability of scientists and engineers..... 88.90 3		
6.2 Talent Impact..... 44.87 27		
6.2.1 Innovation output..... 45.53 38		
6.2.2 High-value exports..... 83.82 6		
6.2.3 New product entrepreneurial activity..... 57.92 29		
6.2.4 New business density..... 10.85 45		
6.2.5 Scientific journal articles..... 26.23 37		

MALI

Key Indicators

Rank (out of 132).....	125
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	19.08

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	30.78	123
1.1 Regulatory Landscape.....	27.95	122
1.1.1 Government effectiveness.....	23.81	122
1.1.2 Rule of law.....	34.51	111
1.1.3 Political stability.....	23.08	127
1.1.4 Regulatory quality.....	34.03	107
1.1.5 Corruption.....	24.32	100
1.2 Market Landscape.....	32.43	115
1.2.1 Competition intensity.....	51.67	113
1.2.2 Ease of doing business.....	40.89	115
1.2.3 Cluster development.....	43.38	64
1.2.4 R&D expenditure.....	6.10	80
1.2.5 ICT infrastructure.....	18.83	113
1.2.6 Urban population.....	33.72	106
1.3 Business and Labour Landscape.....	31.94	115
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	38.83	118
1.3.2 Active labour market policies.....	37.05	71
1.3.3 Labour-employer cooperation.....	17.99	114
1.3.4 Management Practice		
1.3.4 Professional management.....	27.25	119
1.3.5 Relationship of pay to productivity.....	35.08	107
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	34.26	110
1.3.7 Investment in emerging technologies.....	33.17	88
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	35.37	119
2.1 External Openness.....	31.54	107
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	39.53	110
2.1.2 Prevalence of foreign ownership.....	41.67	110
2.1.3 Attract People		
2.1.3 Migrant stock.....	32.55	76
2.1.4 International students.....	3.05	84
2.1.5 Brain gain.....	40.90	78
2.2 Internal Openness.....	39.20	123
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	21.11	106
2.2.2 Tolerance of immigrants.....	80.82	23
2.2.3 Social mobility.....	46.19	100
2.2.4 Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	21.53	129
2.2.6 Leadership opportunities for women.....	26.37	110

GDP per capita (PPP US\$).....	2,312.57
GDP (US\$ billions).....	17.20
GTGI score.....	24.31
GTGI score (income group average).....	26.01

	Score	Rank
3 GROW.....	24.25	122
3.1 Formal Education.....	9.49	116
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	20.07	58
3.1.2 Tertiary enrolment.....	3.75	119
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	14.12	83
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	29.15	117
3.2.1 Quality of management schools.....	35.83	102
3.2.2 Prevalence of training in firms.....	18.87	84
3.2.3 Employee development.....	32.75	85
3.3 Access to Growth Opportunities.....	34.10	113
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	25.14	117
3.3.2 Personal rights.....	53.50	97
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	44.21	119
3.3.4 Use of virtual professional networks.....	0.75	115
3.3.5 Collaboration within organisations.....	46.19	70
3.3.6 Collaboration across organisations.....	34.82	79

4 RETAIN.....	23.87	117
4.1 Sustainability.....	24.15	112
4.1.1 Pension system.....	3.32	111
4.1.2 Social protection.....	38.69	76
4.1.3 Brain retention.....	30.44	96
4.2 Lifestyle.....	23.59	118
4.2.1 Environmental performance.....	27.14	112
4.2.2 Personal safety.....	40.13	93
4.2.3 Physician density.....	1.06	117
4.2.4 Sanitation.....	26.03	120

5 VOCATIONAL AND TECHNICAL SKILLS.....	23.32	124
5.1 Mid-Level Skills.....	3.48	129
5.1.1 Workforce with secondary education.....	3.39	123
5.1.2 Population with secondary education.....	3.76	109
5.1.3 Technicians and associate professionals.....	4.15	123
5.1.4 Labour productivity per employee.....	2.63	104
5.2 Employability.....	43.15	80
5.2.1 Ease of finding skilled employees.....	53.15	68
5.2.2 Relevance of education system to the economy.....	31.71	97
5.2.3 Skills matching with secondary education.....	44.00	61
5.2.4 Skills matching with tertiary education.....	43.74	96

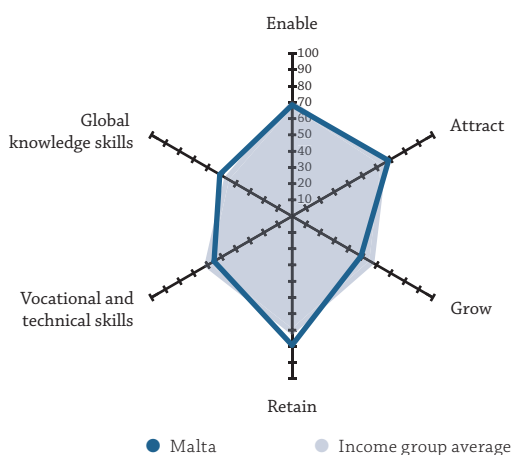
6 GLOBAL KNOWLEDGE SKILLS.....	8.29	125
6.1 High-Level Skills.....	9.28	124
6.1.1 Workforce with tertiary education.....	2.11	121
6.1.2 Population with tertiary education.....	1.59	104
6.1.3 Professionals.....	7.33	115
6.1.4 Researchers.....	0.27	101
6.1.5 Senior officials and managers.....	5.16	115
6.1.6 Availability of scientists and engineers.....	39.21	93
6.2 Talent Impact.....	7.30	118
6.2.1 Innovation output.....	19.09	97
6.2.2 High-value exports.....	2.65	111
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.15	122

MALTA

Key Indicators

Rank (out of 132).....	23
Income group.....	High income
Regional group.....	Europe
Population (millions).....	0.48

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	68.39	27
1.1 Regulatory Landscape.....	75.33	24
1.1.1 Government effectiveness.....	70.89	30
1.1.2 Rule of law.....	79.37	23
1.1.3 Political stability.....	92.79	5
1.1.4 Regulatory quality.....	79.56	21
1.1.5 Corruption.....	54.05	43
1.2 Market Landscape.....	67.59	26
1.2.1 Competition intensity.....	88.60	6
1.2.2 Ease of doing business.....	62.20	78
1.2.3 Cluster development.....	55.81	40
1.2.4 R&D expenditure.....	11.72	56
1.2.5 ICT infrastructure.....	93.38	4
1.2.6 Urban population.....	93.80	6
1.3 Business and Labour Landscape.....	62.25	29
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	93.73	9
1.3.2 Active labour market policies.....	76.80	18
1.3.3 Labour-employer cooperation.....	64.22	24
1.3.4 Management Practice		
1.3.4 Professional management.....	62.78	37
1.3.5 Relationship of pay to productivity.....	62.49	41
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	72.70	30
1.3.7 Investment in emerging technologies.....	53.67	37
1.3.8 Robot density.....	11.58	33
2 ATTRACT.....	68.53	20
2.1 External Openness.....	64.75	20
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	85.75	7
2.1.2 Prevalence of foreign ownership.....	73.03	35
2.1.3 Attract People		
2.1.3 Migrant stock.....	56.24	40
2.1.4 International students.....	30.90	21
2.1.5 Brain gain.....	77.83	12
2.2 Internal Openness.....	72.30	21
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	74.44	20
2.2.2 Tolerance of immigrants.....	71.23	38
2.2.3 Social mobility.....	77.60	21
2.2.4 Gender Equality		
2.2.4 Female graduates.....	78.43	42
2.2.5 Gender development gap.....	74.83	77
2.2.6 Leadership opportunities for women.....	57.27	46

GDP per capita (PPP US\$).....	41,548.51
GDP (US\$ billions).....	14.54
GTGI score.....	62.02
GTGI score (income group average).....	61.46

	Score	Rank
3 GROW.....	48.99	37
3.1 Formal Education.....	28.36	61
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	13.83	74
3.1.2 Tertiary enrolment.....	38.26	57
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	31.22	31
3.1.4 Reading, maths, and science.....	58.49	37
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	55.05	36
3.2.1 Quality of management schools.....	58.75	43
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	51.36	41
3.3 Access to Growth Opportunities.....	63.57	25
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	57.84	37
3.3.2 Personal rights.....	88.09	40
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	92.11	10
3.3.4 Use of virtual professional networks.....	48.32	11
3.3.5 Collaboration within organisations.....	55.18	42
3.3.6 Collaboration across organisations.....	39.88	64

4 RETAIN.....	79.34	14
4.1 Sustainability.....	76.66	20
4.1.1 Pension system.....	94.65	8
4.1.2 Social protection.....	71.61	24
4.1.3 Brain retention.....	63.72	30
4.2 Lifestyle.....	82.03	10
4.2.1 Environmental performance.....	89.13	4
4.2.2 Personal safety.....	76.66	25
4.2.3 Physician density.....	62.36	13
4.2.4 Sanitation.....	99.96	13

5 VOCATIONAL AND TECHNICAL SKILLS.....	55.45	37
5.1 Mid-Level Skills.....	47.76	52
5.1.1 Workforce with secondary education.....	43.59	70
5.1.2 Population with secondary education.....	29.13	77
5.1.3 Technicians and associate professionals.....	65.86	19
5.1.4 Labour productivity per employee.....	52.44	26
5.2 Employability.....	63.14	34
5.2.1 Ease of finding skilled employees.....	44.60	96
5.2.2 Relevance of education system to the economy.....	67.19	22
5.2.3 Skills matching with secondary education.....	66.64	22
5.2.4 Skills matching with tertiary education.....	74.13	27

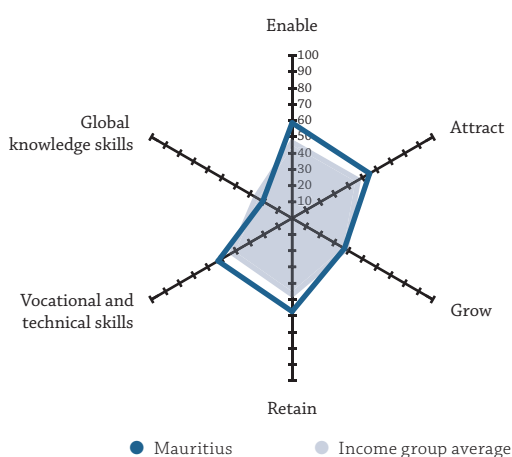
6 GLOBAL KNOWLEDGE SKILLS.....	51.39	21
6.1 High-Level Skills.....	42.10	40
6.1.1 Workforce with tertiary education.....	44.90	37
6.1.2 Population with tertiary education.....	25.79	62
6.1.3 Professionals.....	47.35	30
6.1.4 Researchers.....	25.05	39
6.1.5 Senior officials and managers.....	63.83	12
6.1.6 Availability of scientists and engineers.....	45.66	72
6.2 Talent Impact.....	60.69	9
6.2.1 Innovation output.....	64.80	19
6.2.2 High-value exports.....	63.94	11
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	86.17	3
6.2.5 Scientific journal articles.....	27.86	36

MAURITIUS

Key Indicators

Rank (out of 132).....	49
Income group.....	Upper-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	1.27

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	58.68	41
1.1 Regulatory Landscape.....	69.25	35
1.1.1 Government effectiveness.....	68.35	34
1.1.2 Rule of law.....	68.55	35
1.1.3 Political stability.....	86.85	19
1.1.4 Regulatory quality.....	72.52	32
1.1.5 Corruption.....	50.00	47
1.2 Market Landscape.....	53.13	59
1.2.1 Competition intensity.....	72.08	53
1.2.2 Ease of doing business.....	87.48	18
1.2.3 Cluster development.....	51.43	44
1.2.4 R&D expenditure.....	7.66	72
1.2.5 ICT infrastructure.....	68.19	51
1.2.6 Urban population.....	31.92	108
1.3 Business and Labour Landscape.....	53.65	46
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	75.94	78
1.3.2 Active labour market policies.....	51.72	52
1.3.3 Labour-employer cooperation.....	50.87	43
1.3.4 Management Practice		
1.3.4 Professional management.....	55.41	52
1.3.5 Relationship of pay to productivity.....	48.96	66
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	57.67	53
1.3.7 Investment in emerging technologies.....	34.96	79
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	55.10	46
2.1 External Openness.....	43.57	64
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	56.16	69
2.1.2 Prevalence of foreign ownership.....	61.74	57
2.1.3 Attract People		
2.1.3 Migrant stock.....	28.72	85
2.1.4 International students.....	16.62	42
2.1.5 Brain gain.....	54.61	39
2.2 Internal Openness.....	66.64	35
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	68.89	29
2.2.2 Tolerance of immigrants.....	89.04	11
2.2.3 Social mobility.....	64.79	41
2.2.4 Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	77.45	67
2.2.6 Leadership opportunities for women.....	33.03	97

GDP per capita (PPP US\$).....	23,709.10
GDP (US\$ billions).....	14.22
GTCI score.....	46.96
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	37.19	70
3.1 Formal Education.....	13.19	98
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	18.09	59
3.1.2 Tertiary enrolment.....	30.31	70
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	4.37	111
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	45.23	63
3.2.1 Quality of management schools.....	51.74	56
3.2.2 Prevalence of training in firms.....	29.29	62
3.2.3 Employee development.....	54.68	37
3.3 Access to Growth Opportunities.....	53.14	43
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	53.61	44
3.3.2 Personal rights.....	91.41	32
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	78.92	55
3.3.4 Use of virtual professional networks.....	17.46	37
3.3.5 Collaboration within organisations.....	45.02	75
3.3.6 Collaboration across organisations.....	32.43	85

4 RETAIN.....	57.38	49
4.1 Sustainability.....	52.02	45
4.1.1 Pension system.....	60.90	47
4.1.2 Social protection.....	51.14	47
4.1.3 Brain retention.....	44.02	56
4.2 Lifestyle.....	62.74	47
4.2.1 Environmental performance.....	48.67	78
4.2.2 Personal safety.....	77.84	24
4.2.3 Physician density.....	31.82	57
4.2.4 Sanitation.....	92.63	62

5 VOCATIONAL AND TECHNICAL SKILLS.....	52.58	41
5.1 Mid-Level Skills.....	52.36	44
5.1.1 Workforce with secondary education.....	58.52	42
5.1.2 Population with secondary education.....	52.84	39
5.1.3 Technicians and associate professionals.....	45.73	47
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	52.80	55
5.2.1 Ease of finding skilled employees.....	51.55	77
5.2.2 Relevance of education system to the economy.....	50.67	54
5.2.3 Skills matching with secondary education.....	54.83	40
5.2.4 Skills matching with tertiary education.....	54.14	69

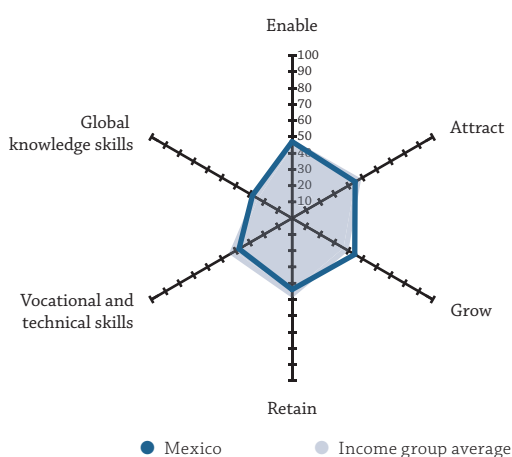
6 GLOBAL KNOWLEDGE SKILLS.....	20.83	80
6.1 High-Level Skills.....	21.94	86
6.1.1 Workforce with tertiary education.....	27.45	70
6.1.2 Population with tertiary education.....	6.87	95
6.1.3 Professionals.....	24.50	70
6.1.4 Researchers.....	9.32	54
6.1.5 Senior officials and managers.....	21.96	65
6.1.6 Availability of scientists and engineers.....	41.56	85
6.2 Talent Impact.....	19.72	70
6.2.1 Innovation output.....	20.32	93
6.2.2 High-value exports.....	6.64	94
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	47.08	13
6.2.5 Scientific journal articles.....	4.85	69

MEXICO

Key Indicators

Rank (out of 132).....	69
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	126.19

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 47.13 70		
1.1 Regulatory Landscape..... 41.60 89		
1.1.1 Government effectiveness..... 45.93 73		
1.1.2 Rule of law..... 39.43 101		
1.1.3 Political stability..... 50.81 100		
1.1.4 Regulatory quality..... 52.90 60		
1.1.5 Corruption..... 18.92 112		
1.2 Market Landscape..... 55.79 52		
1.2.1 Competition intensity..... 71.46 58		
1.2.2 Ease of doing business..... 74.10 50		
1.2.3 Cluster development..... 55.87 38		
1.2.4 R&D expenditure..... 10.35 65		
1.2.5 ICT infrastructure..... 45.80 78		
1.2.6 Urban population..... 77.18 35		
1.3 Business and Labour Landscape..... 44.01 71		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... 86.41 45		
1.3.2 Active labour market policies..... 23.14 106		
1.3.3 Labour-employer cooperation..... 40.84 58		
1.3.4 Management Practice		
1.3.4 Professional management..... 48.98 66		
1.3.5 Relationship of pay to productivity..... 42.77 79		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 58.16 52		
1.3.7 Investment in emerging technologies..... 39.74 62		
1.3.8 Robot density..... 12.04 32		
2 ATTRACT..... 44.80 90		
2.1 External Openness..... 41.98 69		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 74.80 25		
2.1.2 Prevalence of foreign ownership..... 79.50 23		
2.1.3 Attract People		
2.1.3 Migrant stock..... 8.03 122		
2.1.4 International students..... 0.99 101		
2.1.5 Brain gain..... 46.56 57		
2.2 Internal Openness..... 47.63 102		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 37.78 79		
2.2.2 Tolerance of immigrants..... 47.95 85		
2.2.3 Social mobility..... 47.70 96		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 64.09 77		
2.2.5 Gender development gap..... 72.44 82		
2.2.6 Leadership opportunities for women..... 15.85 125		

GDP per capita (PPP US\$).....	19,969.46
GDP (US\$ billions).....	1,223.81
GTCI score.....	41.03
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW..... 44.52 45		
3.1 Formal Education..... 35.29 44		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... 41.35 25		
3.1.2 Tertiary enrolment..... 29.78 71		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... 25.82 46		
3.1.4 Reading, maths, and science..... 36.05 54		
3.1.5 University ranking..... 43.46 26		
3.2 Lifelong Learning..... 49.19 52		
3.2.1 Quality of management schools..... 49.46 59		
3.2.2 Prevalence of training in firms..... 62.53 20		
3.2.3 Employee development..... 35.57 76		
3.3 Access to Growth Opportunities..... 49.08 54		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 48.19 63		
3.3.2 Personal rights..... 73.74 66		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 73.50 68		
3.3.4 Use of virtual professional networks..... 17.01 38		
3.3.5 Collaboration within organisations..... 40.92 93		
3.3.6 Collaboration across organisations..... 41.14 59		

4 RETAIN..... 43.88 79		
4.1 Sustainability..... 36.30 78		
4.1.1 Pension system..... 27.55 74		
4.1.2 Social protection..... 37.82 78		
4.1.3 Brain retention..... 43.52 60		
4.2 Lifestyle..... 51.47 73		
4.2.1 Environmental performance..... 53.78 63		
4.2.2 Personal safety..... 28.22 112		
4.2.3 Physician density..... 35.47 56		
4.2.4 Sanitation..... 88.40 72		

5 VOCATIONAL AND TECHNICAL SKILLS..... 37.70 81		
5.1 Mid-Level Skills..... 28.18 90		
5.1.1 Workforce with secondary education..... 31.10 87		
5.1.2 Population with secondary education..... 24.60 86		
5.1.3 Technicians and associate professionals..... 30.46 72		
5.1.4 Labour productivity per employee..... 26.57 57		
5.2 Employability..... 47.21 71		
5.2.1 Ease of finding skilled employees..... 59.62 56		
5.2.2 Relevance of education system to the economy..... 28.94 105		
5.2.3 Skills matching with secondary education..... 39.92 76		
5.2.4 Skills matching with tertiary education..... 60.38 52		

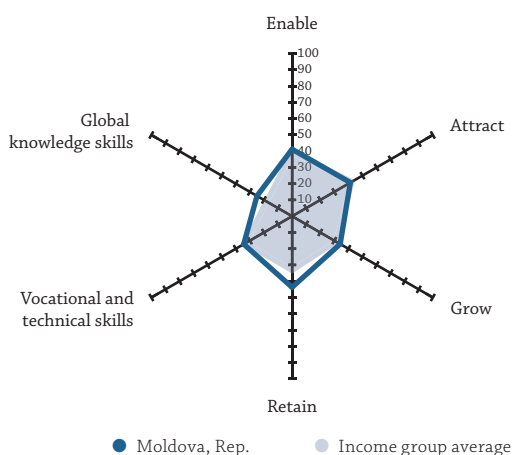
6 GLOBAL KNOWLEDGE SKILLS..... 28.14 62		
6.1 High-Level Skills..... 25.31 78		
6.1.1 Workforce with tertiary education..... 26.14 74		
6.1.2 Population with tertiary education..... 23.11 66		
6.1.3 Professionals..... 24.54 69		
6.1.4 Researchers..... 2.84 75		
6.1.5 Senior officials and managers..... 18.33 71		
6.1.6 Availability of scientists and engineers..... 56.87 49		
6.2 Talent Impact..... 30.98 48		
6.2.1 Innovation output..... 36.78 54		
6.2.2 High-value exports..... 47.66 18		
6.2.3 New product entrepreneurial activity..... 63.31 19		
6.2.4 New business density..... 2.54 84		
6.2.5 Scientific journal articles..... 4.63 70		

MOLDOVA, REP.

Key Indicators

Rank (out of 132).....	86
Income group.....	Lower-middle income
Regional group.....	Europe
Population (millions).....	3.55

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....41.24 91		
1.1 Regulatory Landscape.....41.94 86		
1.1.1 Government effectiveness.....34.15 98		
1.1.2 Rule of law.....42.99 92		
1.1.3 Political stability.....59.75 75		
1.1.4 Regulatory quality.....47.15 71		
1.1.5 Corruption.....25.68 97		
1.2 Market Landscape.....44.09 80		
1.2.1 Competition intensity.....60.82 85		
1.2.2 Ease of doing business.....76.69 43		
1.2.3 Cluster development.....11.91 129		
1.2.4 R&D expenditure.....6.30 79		
1.2.5 ICT infrastructure.....74.81 35		
1.2.6 Urban population.....34.03 105		
1.3 Business and Labour Landscape.....37.69 95		
Labour Market		
1.3.1 Tertiary-educated unemployment.....89.86 26		
1.3.2 Active labour market policies.....32.61 82		
1.3.3 Labour-employer cooperation.....38.26 67		
Management Practice		
1.3.4 Professional management.....34.23 100		
1.3.5 Relationship of pay to productivity.....48.56 68		
Technology Adoption		
1.3.6 Technology utilisation.....38.40 101		
1.3.7 Investment in emerging technologies.....19.51 118		
1.3.8 Robot density.....0.10 64		
2 ATTRACT.....41.40 103		
2.1 External Openness.....29.32 113		
Attract Business		
2.1.1 FDI and technology transfer.....47.39 93		
2.1.2 Prevalence of foreign ownership.....36.18 118		
Attract People		
2.1.3 Migrant stock.....34.26 74		
2.1.4 International students.....15.09 47		
2.1.5 Brain gain.....13.67 125		
2.2 Internal Openness.....53.49 81		
Social Inclusion		
2.2.1 Tolerance of minorities.....33.33 85		
2.2.2 Tolerance of immigrants.....26.03 111		
2.2.3 Social mobility.....41.69 113		
Gender Equality		
2.2.4 Female graduates.....78.73 40		
2.2.5 Gender development gap.....90.64 14		
2.2.6 Leadership opportunities for women.....50.53 59		

GDP per capita (PPP US\$).....	7,300.94
GDP (US\$ billions).....	11.31
GTCI score.....	36.64
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....34.18 80		
3.1 Formal Education.....23.06 70		
Enrolment		
3.1.1 Vocational enrolment.....22.32 52		
3.1.2 Tertiary enrolment.....32.09 69		
Quality		
3.1.3 Tertiary education expenditure.....22.20 59		
3.1.4 Reading, maths, and science.....38.70 51		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....30.43 110		
3.2.1 Quality of management schools.....28.96 117		
3.2.2 Prevalence of training in firms.....38.26 45		
3.2.3 Employee development.....24.07 114		
3.3 Access to Growth Opportunities.....49.05 55		
Empowerment		
3.3.1 Delegation of authority.....34.22 99		
3.3.2 Personal rights.....77.89 61		
Collaboration		
3.3.3 Use of virtual social networks.....71.62 71		
3.3.4 Use of virtual professional networks.....n/a n/a		
3.3.5 Collaboration within organisations.....41.95 90		
3.3.6 Collaboration across organisations.....19.58 121		

4 RETAIN.....43.71 80		
4.1 Sustainability.....32.14 96		
4.1.1 Pension system.....70.10 38		
4.1.2 Social protection.....20.02 118		
4.1.3 Brain retention.....6.29 127		
4.2 Lifestyle.....55.29 67		
4.2.1 Environmental performance.....40.91 91		
4.2.2 Personal safety.....52.51 68		
4.2.3 Physician density.....50.98 31		
4.2.4 Sanitation.....76.75 86		

5 VOCATIONAL AND TECHNICAL SKILLS.....34.36 94		
5.1 Mid-Level Skills.....35.76 73		
5.1.1 Workforce with secondary education.....47.88 63		
5.1.2 Population with secondary education.....58.31 32		
5.1.3 Technicians and associate professionals.....25.53 80		
5.1.4 Labour productivity per employee.....11.34 83		
5.2 Employability.....32.95 115		
5.2.1 Ease of finding skilled employees.....29.14 129		
5.2.2 Relevance of education system to the economy.....36.01 87		
5.2.3 Skills matching with secondary education.....31.12 100		
5.2.4 Skills matching with tertiary education.....35.55 117		

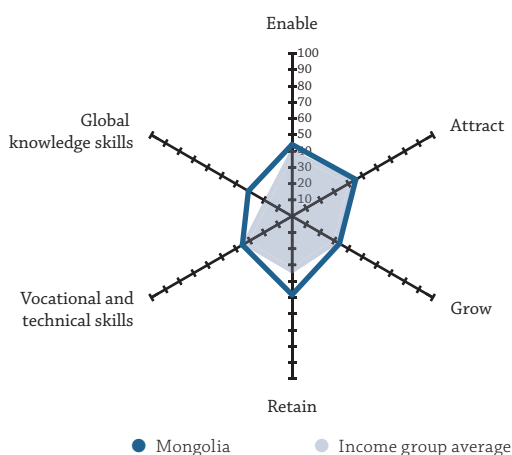
6 GLOBAL KNOWLEDGE SKILLS.....24.95 70		
6.1 High-Level Skills.....32.69 58		
6.1.1 Workforce with tertiary education.....36.16 54		
6.1.2 Population with tertiary education.....52.56 23		
6.1.3 Professionals.....36.95 47		
6.1.4 Researchers.....8.66 56		
6.1.5 Senior officials and managers.....38.41 36		
6.1.6 Availability of scientists and engineers.....23.41 123		
6.2 Talent Impact.....17.21 82		
6.2.1 Innovation output.....41.86 43		
6.2.2 High-value exports.....15.32 69		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....8.41 53		
6.2.5 Scientific journal articles.....3.26 77		

MONGOLIA

Key Indicators

Rank (out of 132).....	75
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	3.17

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....44.14 84		
1.1 Regulatory Landscape.....49.00 67		
1.1.1 Government effectiveness.....40.19 87		
1.1.2 Rule of law.....45.59 83		
1.1.3 Political stability.....82.94 27		
1.1.4 Regulatory quality.....45.21 76		
1.1.5 Corruption.....31.08 77		
1.2 Market Landscape.....40.76 93		
1.2.1 Competition intensity.....57.60 97		
1.2.2 Ease of doing business.....66.33 69		
1.2.3 Cluster development.....15.36 124		
1.2.4 R&D expenditure.....2.62 98		
1.2.5 ICT infrastructure.....38.93 90		
1.2.6 Urban population.....63.72 57		
1.3 Business and Labour Landscape.....42.64 77		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....76.98 73		
1.3.2 Active labour market policies.....30.45 91		
1.3.3 Labour-employer cooperation.....34.76 80		
1.3.4 Management Practice		
1.3.4 Professional management.....41.34 86		
1.3.5 Relationship of pay to productivity.....38.61 91		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....43.44 88		
1.3.7 Investment in emerging technologies.....32.94 89		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....45.24 83		
2.1 External Openness.....25.62 121		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....43.29 103		
2.1.2 Prevalence of foreign ownership.....42.63 105		
2.1.3 Attract People		
2.1.3 Migrant stock.....12.88 110		
2.1.4 International students.....3.45 82		
2.1.5 Brain gain.....25.84 108		
2.2 Internal Openness.....64.86 42		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....75.56 17		
2.2.2 Tolerance of immigrants.....13.70 123		
2.2.3 Social mobility.....62.36 47		
2.2.4 Gender Equality		
2.2.4 Female graduates.....83.16 27		
2.2.5 Gender development gap.....97.08 4		
2.2.6 Leadership opportunities for women.....57.32 45		

GDP per capita (PPP US\$).....	13,735.37
GDP (US\$ billions).....	13.01
GTCI score.....	39.62
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....33.66 84		
3.1 Formal Education.....17.52 85		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....15.58 66		
3.1.2 Tertiary enrolment.....51.00 35		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....3.50 114		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....41.27 71		
3.2.1 Quality of management schools.....18.59 129		
3.2.2 Prevalence of training in firms.....74.41 7		
3.2.3 Employee development.....30.82 91		
3.3 Access to Growth Opportunities.....42.19 90		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....13.91 129		
3.3.2 Personal rights.....88.92 38		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....75.36 60		
3.3.4 Use of virtual professional networks.....4.07 91		
3.3.5 Collaboration within organisations.....53.97 43		
3.3.6 Collaboration across organisations.....16.93 127		

4 RETAIN.....48.31 63		
4.1 Sustainability.....40.92 68		
4.1.1 Pension system.....74.50 33		
4.1.2 Social protection.....31.77 91		
4.1.3 Brain retention.....16.50 122		
4.2 Lifestyle.....55.69 65		
4.2.1 Environmental performance.....50.14 71		
4.2.2 Personal safety.....64.51 43		
4.2.3 Physician density.....52.00 28		
4.2.4 Sanitation.....56.11 102		

5 VOCATIONAL AND TECHNICAL SKILLS.....35.32 87		
5.1 Mid-Level Skills.....45.71 57		
5.1.1 Workforce with secondary education.....65.09 32		
5.1.2 Population with secondary education.....61.47 30		
5.1.3 Technicians and associate professionals.....10.55 112		
5.1.4 Labour productivity per employee.....n/a n/a		
5.2 Employability.....24.94 127		
5.2.1 Ease of finding skilled employees.....15.19 131		
5.2.2 Relevance of education system to the economy.....20.39 120		
5.2.3 Skills matching with secondary education.....44.41 60		
5.2.4 Skills matching with tertiary education.....19.76 131		

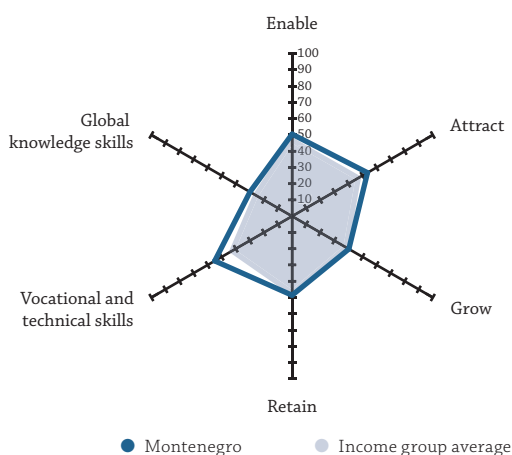
6 GLOBAL KNOWLEDGE SKILLS.....31.06 51		
6.1 High-Level Skills.....41.33 41		
6.1.1 Workforce with tertiary education.....47.37 35		
6.1.2 Population with tertiary education.....37.18 41		
6.1.3 Professionals.....38.04 45		
6.1.4 Researchers.....n/a n/a		
6.1.5 Senior officials and managers.....39.74 35		
6.1.6 Availability of scientists and engineers.....44.32 74		
6.2 Talent Impact.....20.79 69		
6.2.1 Innovation output.....41.86 43		
6.2.2 High-value exports.....9.53 84		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....30.34 22		
6.2.5 Scientific journal articles.....1.42 88		

MONTENEGRO

Key Indicators

Rank (out of 132).....	53
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	0.62

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	50.51	56
1.1 Regulatory Landscape.....	53.17	56
1.1.1 Government effectiveness.....	50.28	63
1.1.2 Rule of law.....	52.97	64
1.1.3 Political stability.....	65.30	67
1.1.4 Regulatory quality.....	55.42	55
1.1.5 Corruption.....	41.89	55
1.2 Market Landscape.....	51.08	65
1.2.1 Competition intensity.....	59.31	91
1.2.2 Ease of doing business.....	75.24	46
1.2.3 Cluster development.....	35.22	86
1.2.4 R&D expenditure.....	6.79	77
1.2.5 ICT infrastructure.....	68.07	52
1.2.6 Urban population.....	61.84	61
1.3 Business and Labour Landscape.....	47.28	64
Labour Market		
1.3.1 Tertiary-educated unemployment.....	66.08	93
1.3.2 Active labour market policies.....	58.94	40
1.3.3 Labour-employer cooperation.....	36.06	74
Management Practice		
1.3.4 Professional management.....	40.90	88
1.3.5 Relationship of pay to productivity.....	48.95	67
Technology Adoption		
1.3.6 Technology utilisation.....	46.36	75
1.3.7 Investment in emerging technologies.....	33.65	86
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	53.57	50
2.1 External Openness.....	53.14	35
Attract Business		
2.1.1 FDI and technology transfer.....	61.32	56
2.1.2 Prevalence of foreign ownership.....	58.90	63
Attract People		
2.1.3 Migrant stock.....	59.37	34
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	32.96	93
2.2 Internal Openness.....	54.01	79
Social Inclusion		
2.2.1 Tolerance of minorities.....	16.67	111
2.2.2 Tolerance of immigrants.....	45.21	91
2.2.3 Social mobility.....	53.76	76
Gender Equality		
2.2.4 Female graduates.....	79.91	34
2.2.5 Gender development gap.....	73.25	80
2.2.6 Leadership opportunities for women.....	55.27	50

GDP per capita (PPP US\$).....	19,354.93
GDP (US\$ billions).....	5.45
GTCI score.....	46.32
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	40.33	58
3.1 Formal Education.....	33.38	49
Enrolment		
3.1.1 Vocational enrolment.....	50.27	17
3.1.2 Tertiary enrolment.....	45.75	47
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	37.48	52
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	39.20	77
3.2.1 Quality of management schools.....	54.24	48
3.2.2 Prevalence of training in firms.....	26.78	68
3.2.3 Employee development.....	36.57	68
3.3 Access to Growth Opportunities.....	48.43	60
Empowerment		
3.3.1 Delegation of authority.....	31.35	111
3.3.2 Personal rights.....	69.96	75
Collaboration		
3.3.3 Use of virtual social networks.....	85.31	30
3.3.4 Use of virtual professional networks.....	11.19	57
3.3.5 Collaboration within organisations.....	51.10	52
3.3.6 Collaboration across organisations.....	41.66	56

4 RETAIN.....	48.61	61
4.1 Sustainability.....	37.62	75
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	40.24	73
4.1.3 Brain retention.....	34.99	81
4.2 Lifestyle.....	59.60	56
4.2.1 Environmental performance.....	56.51	58
4.2.2 Personal safety.....	49.04	78
4.2.3 Physician density.....	37.27	52
4.2.4 Sanitation.....	95.60	51

5 VOCATIONAL AND TECHNICAL SKILLS.....	54.95	38
5.1 Mid-Level Skills.....	60.89	21
5.1.1 Workforce with secondary education.....	84.39	8
5.1.2 Population with secondary education.....	74.37	14
5.1.3 Technicians and associate professionals.....	53.14	38
5.1.4 Labour productivity per employee.....	31.66	54
5.2 Employability.....	49.01	65
5.2.1 Ease of finding skilled employees.....	51.06	81
5.2.2 Relevance of education system to the economy.....	54.14	45
5.2.3 Skills matching with secondary education.....	42.34	67
5.2.4 Skills matching with tertiary education.....	48.47	80

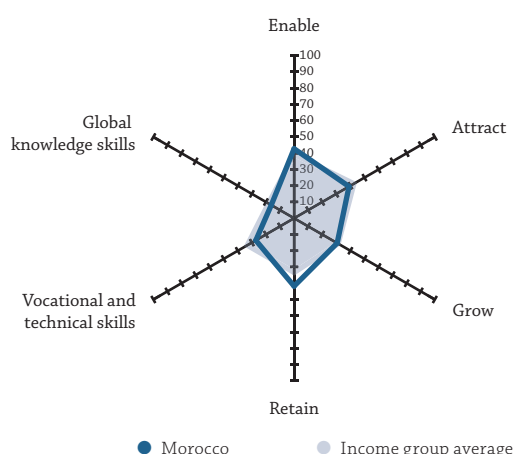
6 GLOBAL KNOWLEDGE SKILLS.....	29.92	55
6.1 High-Level Skills.....	35.47	51
6.1.1 Workforce with tertiary education.....	41.43	44
6.1.2 Population with tertiary education.....	30.37	54
6.1.3 Professionals.....	49.49	24
6.1.4 Researchers.....	8.54	57
6.1.5 Senior officials and managers.....	32.39	45
6.1.6 Availability of scientists and engineers.....	50.61	63
6.2 Talent Impact.....	24.38	58
6.2.1 Innovation output.....	41.33	45
6.2.2 High-value exports.....	7.55	90
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	32.25	21
6.2.5 Scientific journal articles.....	16.38	46

MOROCCO

Key Indicators

Rank (out of 132).....	100
Income group.....	Lower-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	36.03

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....42.76 89		
1.1 Regulatory Landscape.....45.79 77		
1.1.1 Government effectiveness.....42.66 82		
1.1.2 Rule of law.....48.58 72		
1.1.3 Political stability.....56.02 90		
1.1.4 Regulatory quality.....42.49 86		
1.1.5 Corruption.....39.19 59		
1.2 Market Landscape.....51.49 64		
1.2.1 Competition intensity.....66.55 72		
1.2.2 Ease of doing business.....72.19 56		
1.2.3 Cluster development.....42.31 70		
1.2.4 R&D expenditure.....15.34 49		
1.2.5 ICT infrastructure.....55.73 67		
1.2.6 Urban population.....56.83 70		
1.3 Business and Labour Landscape.....31.01 117		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....n/a n/a		
1.3.2 Active labour market policies.....13.80 118		
1.3.3 Labour-employer cooperation.....23.69 104		
1.3.4 Management Practice		
1.3.4 Professional management.....48.99 65		
1.3.5 Relationship of pay to productivity.....41.02 84		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....53.23 60		
1.3.7 Investment in emerging technologies.....34.94 80		
1.3.8 Robot density.....1.40 49		
2 ATTRACT.....39.03 111		
2.1 External Openness.....39.44 79		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....66.15 47		
2.1.2 Prevalence of foreign ownership.....75.95 28		
2.1.3 Attract People		
2.1.3 Migrant stock.....5.14 125		
2.1.4 International students.....7.22 70		
2.1.5 Brain gain.....42.75 70		
2.2 Internal Openness.....38.62 125		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....16.67 111		
2.2.2 Tolerance of immigrants.....39.73 100		
2.2.3 Social mobility.....59.12 57		
2.2.4 Gender Equality		
2.2.4 Female graduates.....48.99 95		
2.2.5 Gender development gap.....31.25 128		
2.2.6 Leadership opportunities for women.....35.99 93		

GDP per capita (PPP US\$).....	8,586.64
GDP (US\$ billions).....	118.50
GTGI score.....	32.93
GTGI score (income group average).....	32.97

	Score	Rank
3 GROW.....30.60 97		
3.1 Formal Education.....15.70 91		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....12.34 79		
3.1.2 Tertiary enrolment.....26.26 76		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....24.18 51		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....35.26 93		
3.2.1 Quality of management schools.....44.46 78		
3.2.2 Prevalence of training in firms.....30.21 59		
3.2.3 Employee development.....31.10 90		
3.3 Access to Growth Opportunities.....40.83 94		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....41.81 77		
3.3.2 Personal rights.....54.60 96		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....72.19 70		
3.3.4 Use of virtual professional networks.....7.04 72		
3.3.5 Collaboration within organisations.....44.48 79		
3.3.6 Collaboration across organisations.....24.88 109		

4 RETAIN.....41.79 85		
4.1 Sustainability.....29.91 98		
4.1.1 Pension system.....30.20 70		
4.1.2 Social protection.....26.38 107		
4.1.3 Brain retention.....33.16 87		
4.2 Lifestyle.....53.67 70		
4.2.1 Environmental performance.....60.08 49		
4.2.2 Personal safety.....62.77 47		
4.2.3 Physician density.....9.61 93		
4.2.4 Sanitation.....82.21 82		

5 VOCATIONAL AND TECHNICAL SKILLS.....27.20 116		
5.1 Mid-Level Skills.....19.87 102		
5.1.1 Workforce with secondary education.....27.19 93		
5.1.2 Population with secondary education.....n/a n/a		
5.1.3 Technicians and associate professionals.....18.45 95		
5.1.4 Labour productivity per employee.....13.98 77		
5.2 Employability.....34.54 111		
5.2.1 Ease of finding skilled employees.....45.97 95		
5.2.2 Relevance of education system to the economy.....25.96 109		
5.2.3 Skills matching with secondary education.....26.39 111		
5.2.4 Skills matching with tertiary education.....39.82 105		

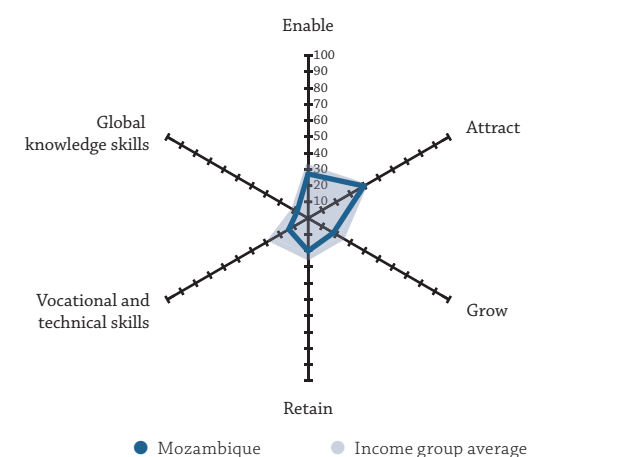
6 GLOBAL KNOWLEDGE SKILLS.....16.21 95		
6.1 High-Level Skills.....16.81 105		
6.1.1 Workforce with tertiary education.....12.97 99		
6.1.2 Population with tertiary education.....n/a n/a		
6.1.3 Professionals.....3.81 123		
6.1.4 Researchers.....12.84 49		
6.1.5 Senior officials and managers.....2.42 122		
6.1.6 Availability of scientists and engineers.....51.99 59		
6.2 Talent Impact.....15.62 85		
6.2.1 Innovation output.....29.60 65		
6.2.2 High-value exports.....10.76 83		
6.2.3 New product entrepreneurial activity.....25.25 74		
6.2.4 New business density.....7.92 58		
6.2.5 Scientific journal articles.....4.55 71		

MOZAMBIQUE

Key Indicators

Rank (out of 132).....	128
Income group	Low income
Regional group	Sub-Saharan Africa
Population (millions)	29.50

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....27.27 127		
1.1 Regulatory Landscape.....28.00 121		
1.1.1 Government effectiveness.....24.90 121		
1.1.2 Rule of law.....29.16 120		
1.1.3 Political stability.....43.60 115		
1.1.4 Regulatory quality.....30.18 114		
1.1.5 Corruption.....12.16 125		
1.2 Market Landscape.....26.81 124		
1.2.1 Competition intensity.....45.92 124		
1.2.2 Ease of doing business.....44.52 110		
1.2.3 Cluster development.....26.14 106		
1.2.4 R&D expenditure.....7.08 76		
1.2.5 ICT infrastructure.....10.81 121		
1.2.6 Urban population.....26.40 114		
1.3 Business and Labour Landscape.....26.99 121		
Labour Market		
1.3.1 Tertiary-educated unemployment.....75.87 79		
1.3.2 Active labour market policies.....12.10 122		
1.3.3 Labour-employer cooperation.....10.77 123		
Management Practice		
1.3.4 Professional management.....20.31 128		
1.3.5 Relationship of pay to productivity.....16.25 129		
Technology Adoption		
1.3.6 Technology utilisation.....27.61 116		
1.3.7 Investment in emerging technologies.....26.00 105		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....39.62 109		
2.1 External Openness.....32.03 105		
Attract Business		
2.1.1 FDI and technology transfer.....45.77 97		
2.1.2 Prevalence of foreign ownership.....53.35 84		
Attract People		
2.1.3 Migrant stock.....18.72 103		
2.1.4 International students.....0.98 102		
2.1.5 Brain gain.....41.33 77		
2.2 Internal Openness.....47.22 103		
Social Inclusion		
2.2.1 Tolerance of minorities.....48.89 60		
2.2.2 Tolerance of immigrants.....71.23 38		
2.2.3 Social mobility.....35.71 125		
Gender Equality		
2.2.4 Female graduates.....47.08 98		
2.2.5 Gender development gap.....54.73 109		
2.2.6 Leadership opportunities for women.....25.67 113		

GDP per capita (PPP US\$)	1,327.92
GDP (US\$ billions)	14.46
GTCI score.....	21.09
GTCI score (income group average)	26.01

	Score	Rank
3 GROW.....17.98 129		
3.1 Formal Education.....9.70 113		
Enrolment		
3.1.1 Vocational enrolment.....14.23 72		
3.1.2 Tertiary enrolment.....4.91 115		
Quality		
3.1.3 Tertiary education expenditure.....19.67 66		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....14.20 130		
3.2.1 Quality of management schools.....11.57 131		
3.2.2 Prevalence of training in firms.....22.82 78		
3.2.3 Employee development.....8.20 130		
3.3 Access to Growth Opportunities.....30.03 123		
Empowerment		
3.3.1 Delegation of authority.....20.16 122		
3.3.2 Personal rights.....58.08 90		
Collaboration		
3.3.3 Use of virtual social networks.....45.31 118		
3.3.4 Use of virtual professional networks.....0.65 116		
3.3.5 Collaboration within organisations.....27.24 125		
3.3.6 Collaboration across organisations.....28.77 97		

4 RETAIN.....20.15 126		
4.1 Sustainability.....19.95 119		
4.1.1 Pension system.....5.80 103		
4.1.2 Social protection.....24.17 110		
4.1.3 Brain retention.....29.86 97		
4.2 Lifestyle.....20.36 125		
4.2.1 Environmental performance.....31.57 107		
4.2.2 Personal safety.....31.56 107		
4.2.3 Physician density.....0.58 122		
4.2.4 Sanitation.....17.74 124		

5 VOCATIONAL AND TECHNICAL SKILLS.....13.67 131		
5.1 Mid-Level Skills.....5.66 126		
5.1.1 Workforce with secondary education.....6.81 120		
5.1.2 Population with secondary education.....9.58 105		
5.1.3 Technicians and associate professionals.....5.47 121		
5.1.4 Labour productivity per employee.....0.80 108		
5.2 Employability.....21.67 130		
5.2.1 Ease of finding skilled employees.....33.36 122		
5.2.2 Relevance of education system to the economy.....20.71 119		
5.2.3 Skills matching with secondary education.....10.69 130		
5.2.4 Skills matching with tertiary education.....21.93 129		

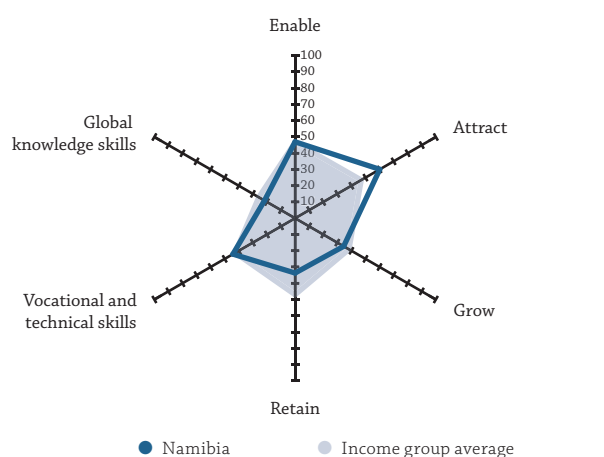
6 GLOBAL KNOWLEDGE SKILLS.....7.87 127		
6.1 High-Level Skills.....5.21 130		
6.1.1 Workforce with tertiary education.....2.20 120		
6.1.2 Population with tertiary education.....1.17 107		
6.1.3 Professionals.....4.46 122		
6.1.4 Researchers.....0.38 96		
6.1.5 Senior officials and managers.....0.16 127		
6.1.6 Availability of scientists and engineers.....22.87 124		
6.2 Talent Impact.....10.53 104		
6.2.1 Innovation output.....14.71 111		
6.2.2 High-value exports.....16.79 66		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....n/a n/a		
6.2.5 Scientific journal articles.....0.10 127		

NAMIBIA

Key Indicators

Rank (out of 132).....	73
Income group.....	Upper-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	2.45

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.01 71		
1.1 Regulatory Landscape.....57.01 50		
1.1.1 Government effectiveness.....51.36 58		
1.1.2 Rule of law.....58.25 53		
1.1.3 Political stability.....79.29 33		
1.1.4 Regulatory quality.....43.43 83		
1.1.5 Corruption.....52.70 44		
1.2 Market Landscape.....38.56 100		
1.2.1 Competition intensity.....57.74 95		
1.2.2 Ease of doing business.....53.45 92		
1.2.3 Cluster development.....35.99 84		
1.2.4 R&D expenditure.....7.13 75		
1.2.5 ICT infrastructure.....34.48 96		
1.2.6 Urban population.....42.55 97		
1.3 Business and Labour Landscape.....45.47 69		
Labour Market		
1.3.1 Tertiary-educated unemployment.....59.82 102		
1.3.2 Active labour market policies.....30.55 90		
1.3.3 Labour-employer cooperation.....42.36 55		
Management Practice		
1.3.4 Professional management.....54.21 55		
1.3.5 Relationship of pay to productivity.....50.00 62		
Technology Adoption		
1.3.6 Technology utilisation.....46.50 73		
1.3.7 Investment in emerging technologies.....34.86 81		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....60.16 34		
2.1 External Openness.....48.80 48		
Attract Business		
2.1.1 FDI and technology transfer.....54.09 75		
2.1.2 Prevalence of foreign ownership.....67.74 46		
Attract People		
2.1.3 Migrant stock.....44.97 56		
2.1.4 International students.....25.87 29		
2.1.5 Brain gain.....51.34 42		
2.2 Internal Openness.....71.51 23		
Social Inclusion		
2.2.1 Tolerance of minorities.....53.33 50		
2.2.2 Tolerance of immigrants.....65.75 51		
2.2.3 Social mobility.....60.86 51		
Gender Equality		
2.2.4 Female graduates.....99.56 2		
2.2.5 Gender development gap.....93.71 8		
2.2.6 Leadership opportunities for women.....55.86 48		

GDP per capita (PPP US\$).....	11,134.81
GDP (US\$ billions).....	14.52
GTCI score.....	40.22
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....34.52 79		
3.1 Formal Education.....17.71 83		
Enrolment		
3.1.1 Vocational enrolment.....n/a n/a		
3.1.2 Tertiary enrolment.....15.81 91		
Quality		
3.1.3 Tertiary education expenditure.....37.31 18		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....37.06 85		
3.2.1 Quality of management schools.....30.08 113		
3.2.2 Prevalence of training in firms.....29.02 63		
3.2.3 Employee development.....52.10 39		
3.3 Access to Growth Opportunities.....48.78 58		
Empowerment		
3.3.1 Delegation of authority.....53.94 43		
3.3.2 Personal rights.....81.43 51		
Collaboration		
3.3.3 Use of virtual social networks.....69.30 83		
3.3.4 Use of virtual professional networks.....9.67 63		
3.3.5 Collaboration within organisations.....44.49 77		
3.3.6 Collaboration across organisations.....33.83 81		

4 RETAIN.....33.71 100		
4.1 Sustainability.....34.87 86		
4.1.1 Pension system.....8.20 99		
4.1.2 Social protection.....47.21 53		
4.1.3 Brain retention.....49.19 46		
4.2 Lifestyle.....32.55 104		
4.2.1 Environmental performance.....51.73 68		
4.2.2 Personal safety.....43.98 89		
4.2.3 Physician density.....5.69 103		
4.2.4 Sanitation.....28.80 118		

5 VOCATIONAL AND TECHNICAL SKILLS.....44.17 66		
5.1 Mid-Level Skills.....50.03 48		
5.1.1 Workforce with secondary education.....76.94 17		
5.1.2 Population with secondary education.....n/a n/a		
5.1.3 Technicians and associate professionals.....23.13 87		
5.1.4 Labour productivity per employee.....n/a n/a		
5.2 Employability.....38.30 96		
5.2.1 Ease of finding skilled employees.....39.00 109		
5.2.2 Relevance of education system to the economy.....35.82 88		
5.2.3 Skills matching with secondary education.....35.05 82		
5.2.4 Skills matching with tertiary education.....43.32 97		

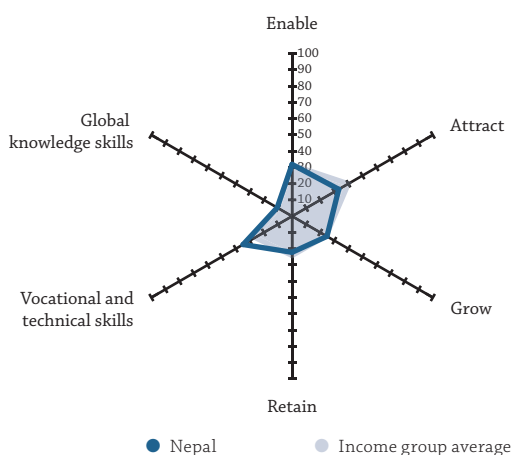
6 GLOBAL KNOWLEDGE SKILLS.....21.74 79		
6.1 High-Level Skills.....21.31 88		
6.1.1 Workforce with tertiary education.....16.49 92		
6.1.2 Population with tertiary education.....n/a n/a		
6.1.3 Professionals.....19.38 80		
6.1.4 Researchers.....1.61 84		
6.1.5 Senior officials and managers.....29.73 49		
6.1.6 Availability of scientists and engineers.....39.32 92		
6.2 Talent Impact.....22.18 66		
6.2.1 Innovation output.....18.04 100		
6.2.2 High-value exports.....3.68 105		
6.2.3 New product entrepreneurial activity.....82.23 6		
6.2.4 New business density.....5.19 69		
6.2.5 Scientific journal articles.....1.77 85		

NEPAL

Key Indicators

Rank (out of 132).....	121
Income group	Low income
Regional group	Central and Southern Asia
Population (millions)	28.09

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....31.90 120		
1.1 Regulatory Landscape.....33.20 112		
1.1.1 Government effectiveness.....25.17 120		
1.1.2 Rule of law.....36.88 106		
1.1.3 Political stability.....50.47 101		
1.1.4 Regulatory quality.....30.51 112		
1.1.5 Corruption.....22.97 104		
1.2 Market Landscape.....29.82 120		
1.2.1 Competition intensity.....59.69 90		
1.2.2 Ease of doing business.....51.84 94		
1.2.3 Cluster development.....28.70 99		
1.2.4 R&D expenditure.....6.30 78		
1.2.5 ICT infrastructure.....24.68 107		
1.2.6 Urban population.....7.71 128		
1.3 Business and Labour Landscape.....32.68 113		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....72.14 91		
1.3.2 Active labour market policies.....30.33 93		
1.3.3 Labour-employer cooperation.....8.53 127		
1.3.4 Management Practice		
1.3.4 Professional management.....29.96 110		
1.3.5 Relationship of pay to productivity.....35.90 103		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....25.63 120		
1.3.7 Investment in emerging technologies.....26.30 104		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....33.14 126		
2.1 External Openness.....20.86 128		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....32.35 123		
2.1.2 Prevalence of foreign ownership.....20.84 130		
2.1.3 Attract People		
2.1.3 Migrant stock.....30.05 83		
2.1.4 International students.....0.00 111		
2.1.5 Brain gain.....21.06 115		
2.2 Internal Openness.....45.42 109		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....3.33 128		
2.2.2 Tolerance of immigrants.....80.82 23		
2.2.3 Social mobility.....47.11 97		
2.2.4 Gender Equality		
2.2.4 Female graduates.....50.76 92		
2.2.5 Gender development gap.....62.02 102		
2.2.6 Leadership opportunities for women.....28.51 106		

GDP per capita (PPP US\$)	3,064.45
GDP (US\$ billions)	28.81
GTGI score.....	26.23
GTGI score (income group average)	26.01

	Score	Rank
3 GROW.....24.76 118		
3.1 Formal Education.....4.20 126		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....0.95 114		
3.1.2 Tertiary enrolment.....8.77 101		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....7.10 102		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....34.58 96		
3.2.1 Quality of management schools.....43.68 80		
3.2.2 Prevalence of training in firms.....37.60 48		
3.2.3 Employee development.....22.45 119		
3.3 Access to Growth Opportunities.....35.50 109		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....32.34 106		
3.3.2 Personal rights.....63.30 85		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....56.59 106		
3.3.4 Use of virtual professional networks.....1.13 110		
3.3.5 Collaboration within organisations.....30.62 115		
3.3.6 Collaboration across organisations.....29.05 94		

4 RETAIN.....22.20 119		
4.1 Sustainability.....14.70 127		
4.1.1 Pension system.....2.80 112		
4.1.2 Social protection.....18.29 120		
4.1.3 Brain retention.....23.00 110		
4.2 Lifestyle.....29.70 106		
4.2.1 Environmental performance.....6.68 127		
4.2.2 Personal safety.....60.80 52		
4.2.3 Physician density.....9.28 94		
4.2.4 Sanitation.....42.02 110		

5 VOCATIONAL AND TECHNICAL SKILLS.....34.81 90		
5.1 Mid-Level Skills.....26.48 93		
5.1.1 Workforce with secondary education.....44.82 65		
5.1.2 Population with secondary education.....15.99 101		
5.1.3 Technicians and associate professionals.....18.63 94		
5.1.4 Labour productivity per employee.....n/a n/a		
5.2 Employability.....43.14 81		
5.2.1 Ease of finding skilled employees.....47.87 90		
5.2.2 Relevance of education system to the economy.....42.26 70		
5.2.3 Skills matching with secondary education.....33.34 89		
5.2.4 Skills matching with tertiary education.....49.09 79		

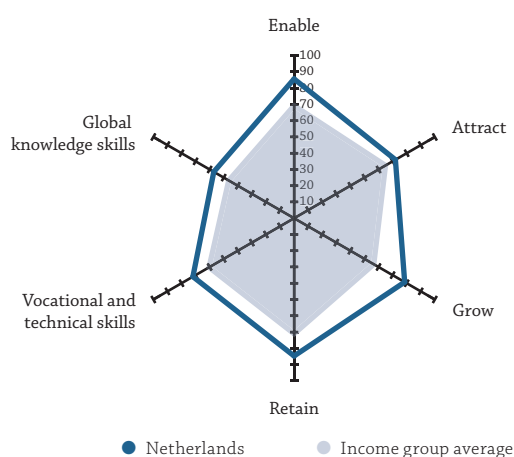
6 GLOBAL KNOWLEDGE SKILLS.....10.59 116		
6.1 High-Level Skills.....16.08 108		
6.1.1 Workforce with tertiary education.....13.38 97		
6.1.2 Population with tertiary education.....5.80 96		
6.1.3 Professionals.....20.83 76		
6.1.4 Researchers.....n/a n/a		
6.1.5 Senior officials and managers.....5.57 112		
6.1.6 Availability of scientists and engineers.....34.82 106		
6.2 Talent Impact.....5.10 121		
6.2.1 Innovation output.....11.56 116		
6.2.2 High-value exports.....3.43 106		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....4.67 72		
6.2.5 Scientific journal articles.....0.76 100		

NETHERLANDS

Key Indicators

Rank (out of 132).....	6
Income group.....	High income
Regional group.....	Europe
Population (millions).....	17.23

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....85.71	5	
1.1 Regulatory Landscape.....	92.44	7
1.1.1 Government effectiveness.....	91.43	6
1.1.2 Rule of law.....	95.40	7
1.1.3 Political stability.....	85.14	21
1.1.4 Regulatory quality.....	98.34	3
1.1.5 Corruption.....	91.89	8
1.2 Market Landscape.....	80.17	10
1.2.1 Competition intensity.....	88.83	4
1.2.2 Ease of doing business.....	81.15	34
1.2.3 Cluster development.....	88.55	5
1.2.4 R&D expenditure.....	43.56	17
1.2.5 ICT infrastructure.....	88.68	9
1.2.6 Urban population.....	90.21	11
1.3 Business and Labour Landscape.....	84.52	5
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	91.96	18
1.3.2 Active labour market policies.....	85.72	10
1.3.3 Labour-employer cooperation.....	90.05	3
1.3.4 Management Practice		
1.3.4 Professional management.....	99.52	2
1.3.5 Relationship of pay to productivity.....	74.91	12
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	92.40	7
1.3.7 Investment in emerging technologies.....	87.95	5
1.3.8 Robot density.....	53.69	10
2 ATTRACT.....71.99	15	
2.1 External Openness.....	68.45	13
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	85.23	8
2.1.2 Prevalence of foreign ownership.....	76.69	27
2.1.3 Attract People		
2.1.3 Migrant stock.....	60.11	31
2.1.4 International students.....	39.40	17
2.1.5 Brain gain.....	80.82	9
2.2 Internal Openness.....	75.54	17
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	64.44	35
2.2.2 Tolerance of immigrants.....	83.56	20
2.2.3 Social mobility.....	90.30	11
2.2.4 Gender Equality		
2.2.4 Female graduates.....	71.83	64
2.2.5 Gender development gap.....	76.96	70
2.2.6 Leadership opportunities for women.....	66.14	30

GDP per capita (PPP US\$).....	56,772.04
GDP (US\$ billions).....	912.87
GTCI score.....	74.99
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....78.57	3	
3.1 Formal Education.....	61.20	5
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	56.09	12
3.1.2 Tertiary enrolment.....	63.36	18
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	38.76	15
3.1.4 Reading, maths, and science.....	79.45	11
3.1.5 University ranking.....	68.32	12
3.2 Lifelong Learning.....	87.06	4
3.2.1 Quality of management schools.....	89.66	3
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	84.45	5
3.3 Access to Growth Opportunities.....	87.45	2
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	90.73	5
3.3.2 Personal rights.....	97.89	7
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	98.10	3
3.3.4 Use of virtual professional networks.....	66.47	4
3.3.5 Collaboration within organisations.....	89.86	6
3.3.6 Collaboration across organisations.....	81.64	5

4 RETAIN.....84.75	7	
4.1 Sustainability.....	88.96	6
4.1.1 Pension system.....	91.40	14
4.1.2 Social protection.....	90.50	9
4.1.3 Brain retention.....	84.98	6
4.2 Lifestyle.....	80.53	14
4.2.1 Environmental performance.....	80.06	18
4.2.2 Personal safety.....	89.04	9
4.2.3 Physician density.....	55.47	22
4.2.4 Sanitation.....	97.55	41

5 VOCATIONAL AND TECHNICAL SKILLS.....71.88	6	
5.1 Mid-Level Skills.....	59.45	26
5.1.1 Workforce with secondary education.....	55.10	47
5.1.2 Population with secondary education.....	52.89	38
5.1.3 Technicians and associate professionals.....	69.74	17
5.1.4 Labour productivity per employee.....	60.06	14
5.2 Employability.....	84.32	5
5.2.1 Ease of finding skilled employees.....	79.41	13
5.2.2 Relevance of education system to the economy.....	83.99	6
5.2.3 Skills matching with secondary education.....	85.60	4
5.2.4 Skills matching with tertiary education.....	88.29	5

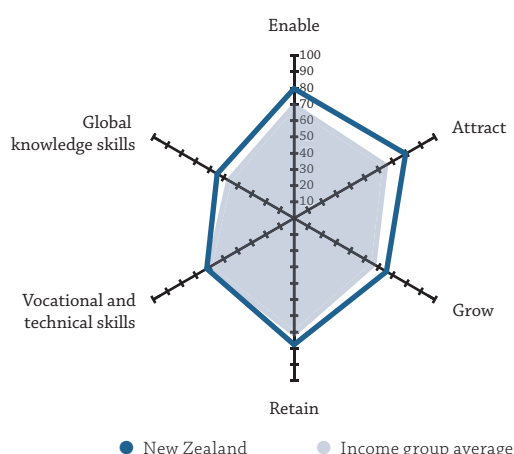
6 GLOBAL KNOWLEDGE SKILLS.....57.06	16	
6.1 High-Level Skills.....	56.27	21
6.1.1 Workforce with tertiary education.....	55.25	23
6.1.2 Population with tertiary education.....	49.99	29
6.1.3 Professionals.....	69.70	5
6.1.4 Researchers.....	60.64	13
6.1.5 Senior officials and managers.....	30.83	48
6.1.6 Availability of scientists and engineers.....	71.22	23
6.2 Talent Impact.....	57.84	14
6.2.1 Innovation output.....	89.49	2
6.2.2 High-value exports.....	55.32	14
6.2.3 New product entrepreneurial activity.....	45.49	47
6.2.4 New business density.....	29.22	23
6.2.5 Scientific journal articles.....	69.68	9

NEW ZEALAND

Key Indicators

Rank (out of 132).....	16
Income group	High income
Regional group	Eastern, Southeastern Asia and Oceania
Population (millions)	4.89

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....79.73	12	
1.1 Regulatory Landscape.....	96.98	2
1.1.1 Government effectiveness	89.35	9
1.1.2 Rule of law	97.57	5
1.1.3 Political stability.....	100.00	1
1.1.4 Regulatory quality.....	99.35	2
1.1.5 Corruption	98.65	2
1.2 Market Landscape.....	71.12	23
1.2.1 Competition intensity.....	72.56	51
1.2.2 Ease of doing business.....	100.00	1
1.2.3 Cluster development.....	58.23	34
1.2.4 R&D expenditure.....	26.65	30
1.2.5 ICT infrastructure.....	84.73	15
1.2.6 Urban population.....	84.52	20
1.3 Business and Labour Landscape.....	71.09	19
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment	87.00	40
1.3.2 Active labour market policies	76.79	19
1.3.3 Labour-employer cooperation	75.50	12
1.3.4 Management Practice		
1.3.4 Professional management	94.95	6
1.3.5 Relationship of pay to productivity.....	71.92	16
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	79.62	16
1.3.7 Investment in emerging technologies	68.51	18
1.3.8 Robot density.....	14.42	28
2 ATTRACT.....79.23	5	
2.1 External Openness	76.87	7
2.1.1 Attract Business		
2.1.1 FDI and technology transfer	78.48	19
2.1.2 Prevalence of foreign ownership.....	82.63	13
2.1.3 Attract People		
2.1.3 Migrant stock	73.79	14
2.1.4 International students.....	72.85	5
2.1.5 Brain gain	76.61	13
2.2 Internal Openness.....	81.59	8
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	75.56	17
2.2.2 Tolerance of immigrants	98.63	2
2.2.3 Social mobility	90.40	10
2.2.4 Gender Equality		
2.2.4 Female graduates	73.48	60
2.2.5 Gender development gap	76.68	72
2.2.6 Leadership opportunities for women	74.80	18

GDP per capita (PPP US\$)	41,702.52
GDP (US\$ billions)	205.02
GTCI score.....	69.84
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....65.62	15	
3.1 Formal Education.....	50.95	17
3.1.1 Enrolment		
3.1.1 Vocational enrolment	22.30	53
3.1.2 Tertiary enrolment	64.67	14
3.1.3 Quality		
3.1.3 Tertiary education expenditure	37.88	16
3.1.4 Reading, maths, and science	78.51	13
3.1.5 University ranking.....	51.42	17
3.2 Lifelong Learning.....	71.13	20
3.2.1 Quality of management schools	72.82	21
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development	69.43	20
3.3 Access to Growth Opportunities	74.79	17
3.3.1 Empowerment		
3.3.1 Delegation of authority	86.87	9
3.3.2 Personal rights	97.26	11
3.3.3 Collaboration		
3.3.3 Use of virtual social networks	85.50	29
3.3.4 Use of virtual professional networks	34.48	19
3.3.5 Collaboration within organisations.....	79.52	16
3.3.6 Collaboration across organisations.....	65.08	19

4 RETAIN.....77.79	18	
4.1 Sustainability	74.95	22
4.1.1 Pension system	n/a	n/a
4.1.2 Social protection.....	84.19	17
4.1.3 Brain retention	65.70	28
4.2 Lifestyle	80.64	13
4.2.1 Environmental performance	80.90	17
4.2.2 Personal safety	92.87	6
4.2.3 Physician density.....	48.78	35
4.2.4 Sanitation	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS.....62.04	26	
5.1 Mid-Level Skills	54.30	36
5.1.1 Workforce with secondary education	68.64	28
5.1.2 Population with secondary education	51.00	41
5.1.3 Technicians and associate professionals.....	54.05	37
5.1.4 Labour productivity per employee.....	43.52	34
5.2 Employability.....	69.78	22
5.2.1 Ease of finding skilled employees	63.00	47
5.2.2 Relevance of education system to the economy	67.89	20
5.2.3 Skills matching with secondary education	68.60	17
5.2.4 Skills matching with tertiary education.....	79.61	16

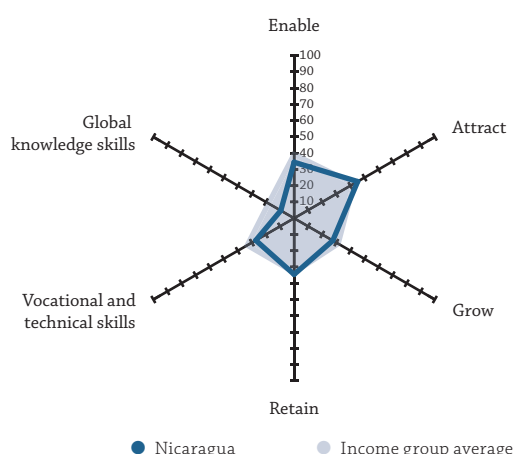
6 GLOBAL KNOWLEDGE SKILLS.....54.66	17	
6.1 High-Level Skills	56.62	20
6.1.1 Workforce with tertiary education	47.74	34
6.1.2 Population with tertiary education.....	51.31	26
6.1.3 Professionals	43.83	37
6.1.4 Researchers	49.05	24
6.1.5 Senior officials and managers	85.10	4
6.1.6 Availability of scientists and engineers.....	62.66	36
6.2 Talent Impact.....	52.70	16
6.2.1 Innovation output	51.84	31
6.2.2 High-value exports.....	26.12	46
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density	69.81	8
6.2.5 Scientific journal articles	63.02	11

NICARAGUA

Key Indicators

Rank (out of 132).....	109
Income group.....	Lower-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	6.47

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	34.46	112
1.1 Regulatory Landscape.....	35.83	105
1.1.1 Government effectiveness.....	31.07	108
1.1.2 Rule of law.....	37.61	103
1.1.3 Political stability.....	64.02	70
1.1.4 Regulatory quality.....	31.59	110
1.1.5 Corruption.....	14.86	120
1.2 Market Landscape.....	34.55	111
1.2.1 Competition intensity.....	54.97	106
1.2.2 Ease of doing business.....	44.71	109
1.2.3 Cluster development.....	21.31	118
1.2.4 R&D expenditure.....	2.06	108
1.2.5 ICT infrastructure.....	31.93	99
1.2.6 Urban population.....	52.31	77
1.3 Business and Labour Landscape.....	33.00	111
Labour Market		
1.3.1 Tertiary-educated unemployment.....	76.64	76
1.3.2 Active labour market policies.....	3.47	129
1.3.3 Labour-employer cooperation.....	46.24	50
Management Practice		
1.3.4 Professional management.....	28.42	115
1.3.5 Relationship of pay to productivity.....	31.57	115
Technology Adoption		
1.3.6 Technology utilisation.....	31.29	114
1.3.7 Investment in emerging technologies.....	13.37	125
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	45.17	84
2.1 External Openness.....	37.34	86
Attract Business		
2.1.1 FDI and technology transfer.....	52.07	81
2.1.2 Prevalence of foreign ownership.....	53.97	79
Attract People		
2.1.3 Migrant stock.....	10.58	117
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	32.73	94
2.2 Internal Openness.....	53.00	86
Social Inclusion		
2.2.1 Tolerance of minorities.....	45.56	65
2.2.2 Tolerance of immigrants.....	71.23	38
2.2.3 Social mobility.....	42.09	111
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	76.79	71
2.2.6 Leadership opportunities for women.....	29.34	102

GDP per capita (PPP US\$).....	5,523.76
GDP (US\$ billions).....	13.12
GTCI score.....	29.73
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	27.50	109
3.1 Formal Education.....	9.72	111
Enrolment		
3.1.1 Vocational enrolment.....	2.23	109
3.1.2 Tertiary enrolment.....	n/a	n/a
Quality		
3.1.3 Tertiary education expenditure.....	26.93	44
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	46.26	59
3.2.1 Quality of management schools.....	43.11	81
3.2.2 Prevalence of training in firms.....	71.11	10
3.2.3 Employee development.....	24.56	112
3.3 Access to Growth Opportunities.....	26.51	126
Empowerment		
3.3.1 Delegation of authority.....	30.78	113
3.3.2 Personal rights.....	25.77	118
Collaboration		
3.3.3 Use of virtual social networks.....	50.28	115
3.3.4 Use of virtual professional networks.....	5.52	78
3.3.5 Collaboration within organisations.....	28.24	122
3.3.6 Collaboration across organisations.....	18.50	123

4 RETAIN.....	34.57	97
4.1 Sustainability.....	28.54	103
4.1.1 Pension system.....	21.02	79
4.1.2 Social protection.....	31.96	90
4.1.3 Brain retention.....	32.65	90
4.2 Lifestyle.....	40.60	97
4.2.1 Environmental performance.....	46.02	82
4.2.2 Personal safety.....	27.49	115
4.2.3 Physician density.....	14.35	85
4.2.4 Sanitation.....	74.55	90

5 VOCATIONAL AND TECHNICAL SKILLS.....	27.22	115
5.1 Mid-Level Skills.....	28.29	89
5.1.1 Workforce with secondary education.....	28.19	90
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	28.39	75
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	26.15	125
5.2.1 Ease of finding skilled employees.....	33.66	120
5.2.2 Relevance of education system to the economy.....	14.85	128
5.2.3 Skills matching with secondary education.....	25.38	117
5.2.4 Skills matching with tertiary education.....	30.73	124

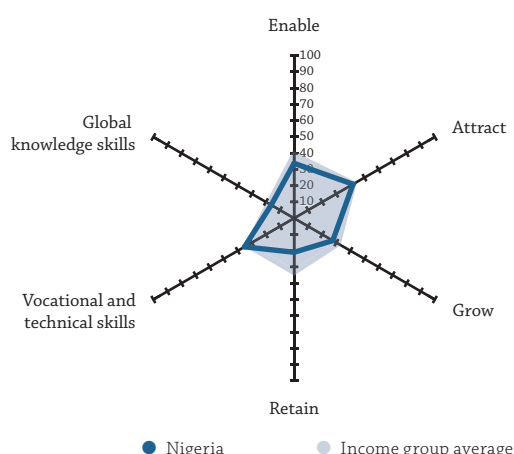
6 GLOBAL KNOWLEDGE SKILLS.....	9.45	122
6.1 High-Level Skills.....	14.98	113
6.1.1 Workforce with tertiary education.....	14.12	95
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	12.90	105
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	10.67	93
6.1.6 Availability of scientists and engineers.....	22.23	126
6.2 Talent Impact.....	3.92	124
6.2.1 Innovation output.....	9.98	119
6.2.2 High-value exports.....	1.59	117
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.18	119

NIGERIA

Key Indicators

Rank (out of 132).....	112
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	195.87

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	33.78	115
1.1 Regulatory Landscape.....	24.39	127
1.1.1 Government effectiveness.....	23.26	123
1.1.2 Rule of law.....	32.44	116
1.1.3 Political stability.....	22.35	128
1.1.4 Regulatory quality.....	26.35	120
1.1.5 Corruption.....	17.57	115
1.2 Market Landscape.....	41.06	91
1.2.1 Competition intensity.....	69.11	65
1.2.2 Ease of doing business.....	39.80	116
1.2.3 Cluster development.....	34.64	89
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	18.83	113
1.2.6 Urban population.....	42.90	96
1.3 Business and Labour Landscape.....	35.90	103
Labour Market		
1.3.1 Tertiary-educated unemployment.....	54.82	107
1.3.2 Active labour market policies.....	14.04	116
1.3.3 Labour-employer cooperation.....	22.29	107
Management Practice		
1.3.4 Professional management.....	53.93	56
1.3.5 Relationship of pay to productivity.....	40.94	85
Technology Adoption		
1.3.6 Technology utilisation.....	42.41	90
1.3.7 Investment in emerging technologies.....	22.87	113
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	41.84	99
2.1 External Openness.....	40.66	75
Attract Business		
2.1.1 FDI and technology transfer.....	47.57	92
2.1.2 Prevalence of foreign ownership.....	60.91	60
Attract People		
2.1.3 Migrant stock.....	11.01	115
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	43.16	69
2.2 Internal Openness.....	43.02	115
Social Inclusion		
2.2.1 Tolerance of minorities.....	6.67	124
2.2.2 Tolerance of immigrants.....	73.97	34
2.2.3 Social mobility.....	54.54	73
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	41.82	118
2.2.6 Leadership opportunities for women.....	38.11	87

GDP per capita (PPP US\$).....	5,980.29
GDP (US\$ billions).....	397.27
GTCI score.....	29.26
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	27.50	108
3.1 Formal Education.....	3.74	127
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	7.48	106
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	33.97	103
3.2.1 Quality of management schools.....	34.26	106
3.2.2 Prevalence of training in firms.....	36.02	50
3.2.3 Employee development.....	31.63	87
3.3 Access to Growth Opportunities.....	44.80	78
Empowerment		
3.3.1 Delegation of authority.....	54.00	42
3.3.2 Personal rights.....	73.60	67
Collaboration		
3.3.3 Use of virtual social networks.....	69.49	82
3.3.4 Use of virtual professional networks.....	2.33	100
3.3.5 Collaboration within organisations.....	47.57	67
3.3.6 Collaboration across organisations.....	21.78	117

4 RETAIN.....	20.95	123
4.1 Sustainability.....	15.53	125
4.1.1 Pension system.....	12.86	91
4.1.2 Social protection.....	1.76	131
4.1.3 Brain retention.....	31.97	92
4.2 Lifestyle.....	26.38	112
4.2.1 Environmental performance.....	45.56	84
4.2.2 Personal safety.....	26.45	117
4.2.3 Physician density.....	6.03	100
4.2.4 Sanitation.....	27.47	119

5 VOCATIONAL AND TECHNICAL SKILLS.....	35.20	88
5.1 Mid-Level Skills.....	44.10	60
5.1.1 Workforce with secondary education.....	31.55	86
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	92.32	3
5.1.4 Labour productivity per employee.....	8.44	89
5.2 Employability.....	26.29	124
5.2.1 Ease of finding skilled employees.....	46.93	93
5.2.2 Relevance of education system to the economy.....	20.22	121
5.2.3 Skills matching with secondary education.....	14.35	128
5.2.4 Skills matching with tertiary education.....	23.67	128

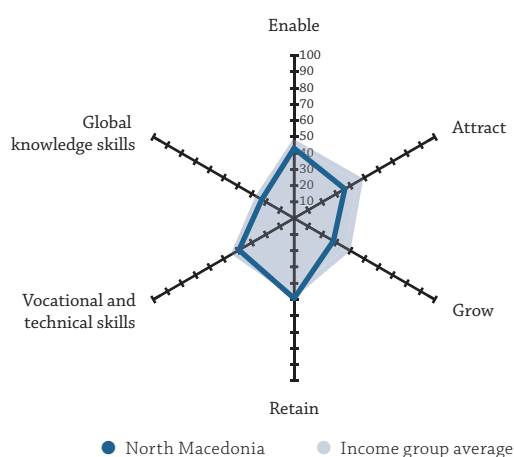
6 GLOBAL KNOWLEDGE SKILLS.....	16.26	94
6.1 High-Level Skills.....	20.42	92
6.1.1 Workforce with tertiary education.....	19.96	85
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	15.39	95
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	5.38	113
6.1.6 Availability of scientists and engineers.....	40.95	87
6.2 Talent Impact.....	12.11	98
6.2.1 Innovation output.....	17.51	102
6.2.2 High-value exports.....	5.65	100
6.2.3 New product entrepreneurial activity.....	32.99	62
6.2.4 New business density.....	3.62	77
6.2.5 Scientific journal articles.....	0.77	99

NORTH MACEDONIA

Key Indicators

Rank (out of 132).....	89
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	2.08

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	43.06	86
1.1 Regulatory Landscape.....	49.61	64
1.1.1 Government effectiveness.....	49.93	64
1.1.2 Rule of law.....	47.01	75
1.1.3 Political stability.....	59.55	78
1.1.4 Regulatory quality.....	60.48	44
1.1.5 Corruption.....	31.08	77
1.2 Market Landscape.....	49.79	67
1.2.1 Competition intensity.....	58.50	94
1.2.2 Ease of doing business.....	91.00	9
1.2.3 Cluster development.....	26.76	105
1.2.4 R&D expenditure.....	7.43	74
1.2.5 ICT infrastructure.....	63.36	59
1.2.6 Urban population.....	51.66	79
1.3 Business and Labour Landscape.....	29.79	119
Labour Market		
1.3.1 Tertiary-educated unemployment.....	41.14	115
1.3.2 Active labour market policies.....	36.78	72
1.3.3 Labour-employer cooperation.....	11.04	120
Management Practice		
1.3.4 Professional management.....	28.18	116
1.3.5 Relationship of pay to productivity.....	40.78	86
Technology Adoption		
1.3.6 Technology utilisation.....	33.16	111
1.3.7 Investment in emerging technologies.....	17.45	123
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	36.04	117
2.1 External Openness.....	29.75	112
Attract Business		
2.1.1 FDI and technology transfer.....	37.49	116
2.1.2 Prevalence of foreign ownership.....	42.09	106
Attract People		
2.1.3 Migrant stock.....	46.38	52
2.1.4 International students.....	12.74	53
2.1.5 Brain gain.....	10.03	128
2.2 Internal Openness.....	42.32	117
Social Inclusion		
2.2.1 Tolerance of minorities.....	37.78	79
2.2.2 Tolerance of immigrants.....	24.66	113
2.2.3 Social mobility.....	29.41	128
Gender Equality		
2.2.4 Female graduates.....	73.93	59
2.2.5 Gender development gap.....	69.64	87
2.2.6 Leadership opportunities for women.....	18.53	121

GDP per capita (PPP US\$).....	15,298.88
GDP (US\$ billions).....	12.67
GTGI score.....	36.42
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	27.93	107
3.1 Formal Education.....	22.99	71
Enrolment		
3.1.1 Vocational enrolment.....	45.75	19
3.1.2 Tertiary enrolment.....	32.14	68
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	14.06	65
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	15.07	129
3.2.1 Quality of management schools.....	19.27	127
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	10.88	128
3.3 Access to Growth Opportunities.....	45.71	69
Empowerment		
3.3.1 Delegation of authority.....	29.44	114
3.3.2 Personal rights.....	68.47	77
Collaboration		
3.3.3 Use of virtual social networks.....	81.14	43
3.3.4 Use of virtual professional networks.....	n/a	n/a
3.3.5 Collaboration within organisations.....	28.62	120
3.3.6 Collaboration across organisations.....	20.91	119

4 RETAIN.....	49.34	60
4.1 Sustainability.....	36.22	79
4.1.1 Pension system.....	80.00	27
4.1.2 Social protection.....	18.48	119
4.1.3 Brain retention.....	10.18	126
4.2 Lifestyle.....	62.47	49
4.2.1 Environmental performance.....	56.06	60
4.2.2 Personal safety.....	57.79	61
4.2.3 Physician density.....	45.80	40
4.2.4 Sanitation.....	90.22	70

5 VOCATIONAL AND TECHNICAL SKILLS.....	39.15	79
5.1 Mid-Level Skills.....	46.97	54
5.1.1 Workforce with secondary education.....	75.90	19
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	42.65	50
5.1.4 Labour productivity per employee.....	22.36	65
5.2 Employability.....	31.34	119
5.2.1 Ease of finding skilled employees.....	32.80	123
5.2.2 Relevance of education system to the economy.....	25.45	111
5.2.3 Skills matching with secondary education.....	32.78	94
5.2.4 Skills matching with tertiary education.....	34.32	120

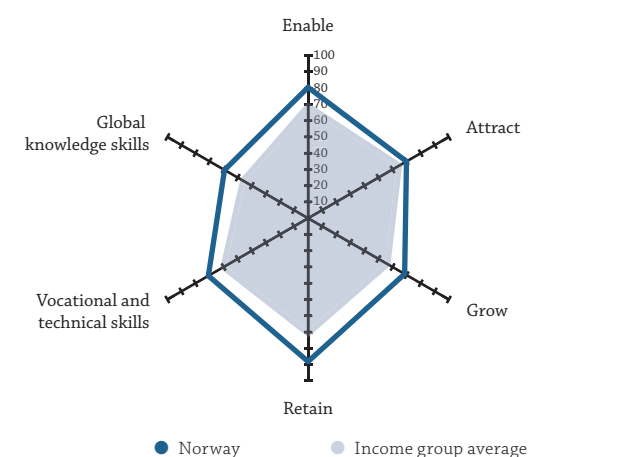
6 GLOBAL KNOWLEDGE SKILLS.....	23.00	76
6.1 High-Level Skills.....	26.42	73
6.1.1 Workforce with tertiary education.....	36.43	53
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	38.77	44
6.1.4 Researchers.....	8.72	55
6.1.5 Senior officials and managers.....	22.78	64
6.1.6 Availability of scientists and engineers.....	25.42	119
6.2 Talent Impact.....	19.57	72
6.2.1 Innovation output.....	32.40	62
6.2.2 High-value exports.....	10.98	82
6.2.3 New product entrepreneurial activity.....	26.66	70
6.2.4 New business density.....	18.64	32
6.2.5 Scientific journal articles.....	9.16	55

NORWAY

Key Indicators

Rank (out of 132).....	9
Income group	High income
Regional group	Europe
Population (millions)	5.31

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....80.51	11	
1.1 Regulatory Landscape.....	94.40	4
1.1.1 Government effectiveness.....	94.62	3
1.1.2 Rule of law.....	99.84	2
1.1.3 Political stability.....	90.33	8
1.1.4 Regulatory quality.....	92.60	8
1.1.5 Corruption.....	94.59	7
1.2 Market Landscape.....	73.99	16
1.2.1 Competition intensity.....	70.11	64
1.2.2 Ease of doing business.....	93.50	6
1.2.3 Cluster development.....	74.35	17
1.2.4 R&D expenditure.....	46.01	16
1.2.5 ICT infrastructure.....	80.41	23
1.2.6 Urban population.....	79.59	28
1.3 Business and Labour Landscape.....	73.13	14
Labour Market		
1.3.1 Tertiary-educated unemployment.....	92.45	15
1.3.2 Active labour market policies.....	86.15	9
1.3.3 Labour-employer cooperation.....	82.96	8
Management Practice		
1.3.4 Professional management.....	85.35	15
1.3.5 Relationship of pay to productivity.....	65.73	33
Technology Adoption		
1.3.6 Technology utilisation.....	82.39	15
1.3.7 Investment in emerging technologies.....	73.55	15
1.3.8 Robot density.....	16.47	25
2 ATTRACT.....69.91	16	
2.1 External Openness.....	54.58	31
Attract Business		
2.1.1 FDI and technology transfer.....	70.98	36
2.1.2 Prevalence of foreign ownership.....	56.34	71
Attract People		
2.1.3 Migrant stock.....	63.99	25
2.1.4 International students.....	14.32	50
2.1.5 Brain gain.....	67.28	23
2.2 Internal Openness.....	85.25	4
Social Inclusion		
2.2.1 Tolerance of minorities.....	74.44	20
2.2.2 Tolerance of immigrants.....	97.26	3
2.2.3 Social mobility.....	88.53	12
Gender Equality		
2.2.4 Female graduates.....	77.58	45
2.2.5 Gender development gap.....	85.84	27
2.2.6 Leadership opportunities for women.....	87.85	7

GDP per capita (PPP US\$)	63,756.34
GDP (US\$ billions)	434.75
GTCI score.....	72.91
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....68.60	12	
3.1 Formal Education.....	55.66	11
Enrolment		
3.1.1 Vocational enrolment.....	43.52	23
3.1.2 Tertiary enrolment.....	64.64	15
Quality		
3.1.3 Tertiary education expenditure.....	47.28	5
3.1.4 Reading, maths, and science.....	77.82	14
3.1.5 University ranking.....	45.06	24
3.2 Lifelong Learning.....	74.35	15
3.2.1 Quality of management schools.....	72.36	22
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	76.33	12
3.3 Access to Growth Opportunities.....	75.80	15
Empowerment		
3.3.1 Delegation of authority.....	91.05	4
3.3.2 Personal rights.....	100.00	1
Collaboration		
3.3.3 Use of virtual social networks.....	86.95	23
3.3.4 Use of virtual professional networks.....	30.66	22
3.3.5 Collaboration within organisations.....	85.83	9
3.3.6 Collaboration across organisations.....	60.31	26

4 RETAIN.....88.18	2	
4.1 Sustainability.....	91.28	4
4.1.1 Pension system.....	94.09	9
4.1.2 Social protection.....	100.00	1
4.1.3 Brain retention.....	79.74	11
4.2 Lifestyle.....	85.08	6
4.2.1 Environmental performance.....	83.45	14
4.2.2 Personal safety.....	88.96	10
4.2.3 Physician density.....	70.01	5
4.2.4 Sanitation.....	97.91	38

5 VOCATIONAL AND TECHNICAL SKILLS.....70.85	8	
5.1 Mid-Level Skills.....	65.13	13
5.1.1 Workforce with secondary education.....	53.86	49
5.1.2 Population with secondary education.....	54.58	37
5.1.3 Technicians and associate professionals.....	70.26	16
5.1.4 Labour productivity per employee.....	81.81	5
5.2 Employability.....	76.58	13
5.2.1 Ease of finding skilled employees.....	85.95	5
5.2.2 Relevance of education system to the economy.....	74.65	11
5.2.3 Skills matching with secondary education.....	67.99	20
5.2.4 Skills matching with tertiary education.....	77.71	20

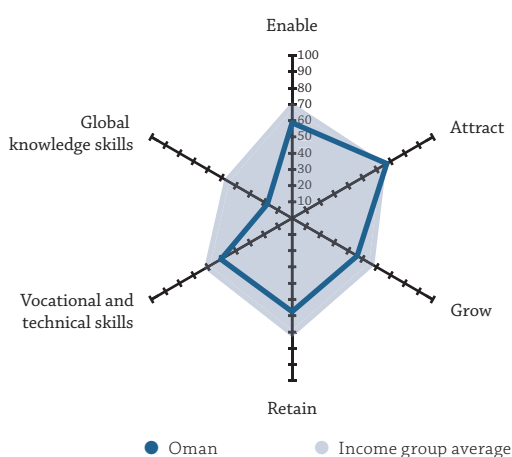
6 GLOBAL KNOWLEDGE SKILLS.....59.39	13	
6.1 High-Level Skills.....	67.84	6
6.1.1 Workforce with tertiary education.....	65.29	13
6.1.2 Population with tertiary education.....	59.40	12
6.1.3 Professionals.....	71.72	3
6.1.4 Researchers.....	78.49	8
6.1.5 Senior officials and managers.....	54.04	20
6.1.6 Availability of scientists and engineers.....	78.08	13
6.2 Talent Impact.....	50.95	18
6.2.1 Innovation output.....	56.22	26
6.2.2 High-value exports.....	54.89	16
6.2.3 New product entrepreneurial activity.....	23.20	76
6.2.4 New business density.....	39.23	17
6.2.5 Scientific journal articles.....	81.20	4

OMAN

Key Indicators

Rank (out of 132).....	43
Income group.....	High income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	4.83

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....58.71	40	
1.1 Regulatory Landscape.....	61.08	48
1.1.1 Government effectiveness.....	51.56	57
1.1.2 Rule of law.....	62.76	45
1.1.3 Political stability.....	81.30	31
1.1.4 Regulatory quality.....	58.42	49
1.1.5 Corruption.....	51.35	45
1.2 Market Landscape.....	59.34	39
1.2.1 Competition intensity.....	64.87	75
1.2.2 Ease of doing business.....	65.34	72
1.2.3 Cluster development.....	67.29	23
1.2.4 R&D expenditure.....	4.54	89
1.2.5 ICT infrastructure.....	71.76	41
1.2.6 Urban population.....	82.22	24
1.3 Business and Labour Landscape.....	55.73	43
Labour Market		
1.3.1 Tertiary-educated unemployment.....	n/a	n/a
1.3.2 Active labour market policies.....	69.94	28
1.3.3 Labour-employer cooperation.....	74.99	13
Management Practice		
1.3.4 Professional management.....	70.74	27
1.3.5 Relationship of pay to productivity.....	63.18	39
Technology Adoption		
1.3.6 Technology utilisation.....	61.08	48
1.3.7 Investment in emerging technologies.....	50.01	42
1.3.8 Robot density.....	0.14	62
2 ATTRACT.....67.27	22	
2.1 External Openness.....	57.19	29
Attract Business		
2.1.1 FDI and technology transfer.....	58.99	60
2.1.2 Prevalence of foreign ownership.....	50.86	91
Attract People		
2.1.3 Migrant stock.....	91.38	4
2.1.4 International students.....	10.73	58
2.1.5 Brain gain.....	73.99	16
2.2 Internal Openness.....	77.35	15
Social Inclusion		
2.2.1 Tolerance of minorities.....	85.56	8
2.2.2 Tolerance of immigrants.....	n/a	n/a
2.2.3 Social mobility.....	72.29	29
Gender Equality		
2.2.4 Female graduates.....	79.31	37
2.2.5 Gender development gap.....	68.27	89
2.2.6 Leadership opportunities for women.....	81.30	11

GDP per capita (PPP US\$).....	41,434.65
GDP (US\$ billions).....	79.29
GTCI score.....	49.63
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....46.26	40	
3.1 Formal Education.....	27.61	62
Enrolment		
3.1.1 Vocational enrolment.....	0.00	118
3.1.2 Tertiary enrolment.....	34.89	65
Quality		
3.1.3 Tertiary education expenditure.....	46.24	6
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	29.31	41
3.2 Lifelong Learning.....	59.56	29
3.2.1 Quality of management schools.....	62.81	35
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	56.31	34
3.3 Access to Growth Opportunities.....	51.61	48
Empowerment		
3.3.1 Delegation of authority.....	64.03	30
3.3.2 Personal rights.....	41.68	106
Collaboration		
3.3.3 Use of virtual social networks.....	71.27	74
3.3.4 Use of virtual professional networks.....	9.97	60
3.3.5 Collaboration within organisations.....	64.86	28
3.3.6 Collaboration across organisations.....	57.88	29

4 RETAIN.....57.48	48	
4.1 Sustainability.....	58.60	39
4.1.1 Pension system.....	13.70	89
4.1.2 Social protection.....	84.46	16
4.1.3 Brain retention.....	77.64	14
4.2 Lifestyle.....	56.35	61
4.2.1 Environmental performance.....	39.82	94
4.2.2 Personal safety.....	55.92	64
4.2.3 Physician density.....	30.40	59
4.2.4 Sanitation.....	99.27	25

5 VOCATIONAL AND TECHNICAL SKILLS.....50.52	44	
5.1 Mid-Level Skills.....	38.42	67
5.1.1 Workforce with secondary education.....	n/a	n/a
5.1.2 Population with secondary education.....	40.30	61
5.1.3 Technicians and associate professionals.....	31.87	69
5.1.4 Labour productivity per employee.....	43.09	35
5.2 Employability.....	62.63	35
5.2.1 Ease of finding skilled employees.....	61.72	52
5.2.2 Relevance of education system to the economy.....	65.93	24
5.2.3 Skills matching with secondary education.....	56.44	37
5.2.4 Skills matching with tertiary education.....	66.42	36

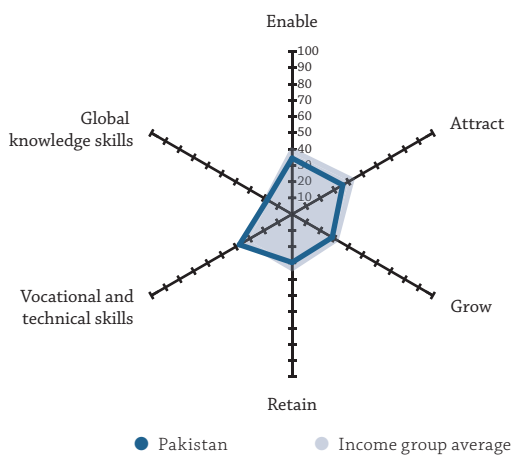
6 GLOBAL KNOWLEDGE SKILLS.....17.54	91	
6.1 High-Level Skills.....	25.38	76
6.1.1 Workforce with tertiary education.....	n/a	n/a
6.1.2 Population with tertiary education.....	21.27	71
6.1.3 Professionals.....	18.66	85
6.1.4 Researchers.....	2.83	76
6.1.5 Senior officials and managers.....	21.42	68
6.1.6 Availability of scientists and engineers.....	62.73	35
6.2 Talent Impact.....	9.71	106
6.2.1 Innovation output.....	18.39	98
6.2.2 High-value exports.....	3.32	108
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	10.12	47
6.2.5 Scientific journal articles.....	7.00	59

PAKISTAN

Key Indicators

Rank (out of 132).....	106
Income group.....	Lower-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	212.22

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 34.50 111		
1.1 Regulatory Landscape..... 27.93 123		
1.1.1 Government effectiveness..... 32.36 102		
1.1.2 Rule of law..... 35.76 110		
1.1.3 Political stability..... 12.34 131		
1.1.4 Regulatory quality..... 33.52 109		
1.1.5 Corruption..... 25.68 97		
1.2 Market Landscape..... 32.65 113		
1.2.1 Competition intensity..... 50.64 115		
1.2.2 Ease of doing business..... 44.12 111		
1.2.3 Cluster development..... 48.01 50		
1.2.4 R&D expenditure..... 4.85 87		
1.2.5 ICT infrastructure..... 21.12 112		
1.2.6 Urban population..... 27.18 110		
1.3 Business and Labour Landscape..... 42.91 76		
Labour Market		
1.3.1 Tertiary-educated unemployment..... 76.48 77		
1.3.2 Active labour market policies..... 56.62 44		
1.3.3 Labour-employer cooperation..... 24.04 103		
Management Practice		
1.3.4 Professional management..... 39.25 93		
1.3.5 Relationship of pay to productivity..... 52.04 59		
Technology Adoption		
1.3.6 Technology utilisation..... 46.59 72		
1.3.7 Investment in emerging technologies..... 48.24 48		
1.3.8 Robot density..... 0.00 68		
2 ATTRACT..... 36.00 118		
2.1 External Openness..... 45.22 59		
Attract Business		
2.1.1 FDI and technology transfer..... 54.17 73		
2.1.2 Prevalence of foreign ownership..... 46.52 98		
Attract People		
2.1.3 Migrant stock..... 31.92 80		
2.1.4 International students..... n/a n/a		
2.1.5 Brain gain..... 48.27 53		
2.2 Internal Openness..... 26.78 131		
Social Inclusion		
2.2.1 Tolerance of minorities..... 6.67 124		
2.2.2 Tolerance of immigrants..... 43.84 96		
2.2.3 Social mobility..... 51.83 80		
Gender Equality		
2.2.4 Female graduates..... n/a n/a		
2.2.5 Gender development gap..... 0.00 130		
2.2.6 Leadership opportunities for women..... 31.56 100		

GDP per capita (PPP US\$).....	5,543.90
GDP (US\$ billions).....	312.57
GTCI score.....	30.63
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW..... 28.52 105		
3.1 Formal Education..... 10.76 105		
Enrolment		
3.1.1 Vocational enrolment..... 4.33 98		
3.1.2 Tertiary enrolment..... 7.44 107		
Quality		
3.1.3 Tertiary education expenditure..... 4.03 113		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 27.23 44		
3.2 Lifelong Learning..... 38.82 79		
3.2.1 Quality of management schools..... 37.65 93		
3.2.2 Prevalence of training in firms..... 37.73 46		
3.2.3 Employee development..... 41.09 61		
3.3 Access to Growth Opportunities..... 35.97 108		
Empowerment		
3.3.1 Delegation of authority..... 35.82 94		
3.3.2 Personal rights..... 37.16 111		
Collaboration		
3.3.3 Use of virtual social networks..... 43.31 122		
3.3.4 Use of virtual professional networks..... 2.63 95		
3.3.5 Collaboration within organisations..... 47.82 65		
3.3.6 Collaboration across organisations..... 49.08 36		

4 RETAIN..... 29.68 108		
4.1 Sustainability..... 33.11 91		
4.1.1 Pension system..... 5.98 102		
4.1.2 Social protection..... 39.12 75		
4.1.3 Brain retention..... 54.22 43		
4.2 Lifestyle..... 26.25 114		
4.2.1 Environmental performance..... 16.79 123		
4.2.2 Personal safety..... 17.78 123		
4.2.3 Physician density..... 15.38 83		
4.2.4 Sanitation..... 55.07 103		

5 VOCATIONAL AND TECHNICAL SKILLS..... 37.46 82		
5.1 Mid-Level Skills..... 19.51 103		
5.1.1 Workforce with secondary education..... 25.84 100		
5.1.2 Population with secondary education..... 25.84 79		
5.1.3 Technicians and associate professionals..... 16.55 101		
5.1.4 Labour productivity per employee..... 9.81 87		
5.2 Employability..... 55.41 48		
5.2.1 Ease of finding skilled employees..... 58.76 59		
5.2.2 Relevance of education system to the economy..... 53.08 47		
5.2.3 Skills matching with secondary education..... 52.44 44		
5.2.4 Skills matching with tertiary education..... 57.38 58		

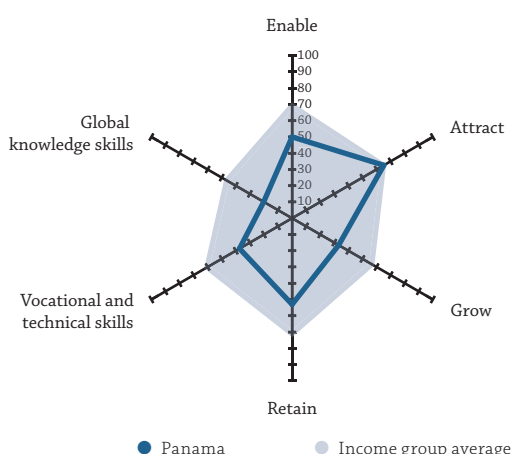
6 GLOBAL KNOWLEDGE SKILLS..... 17.63 90		
6.1 High-Level Skills..... 17.94 98		
6.1.1 Workforce with tertiary education..... 12.29 100		
6.1.2 Population with tertiary education..... 12.37 87		
6.1.3 Professionals..... 13.03 104		
6.1.4 Researchers..... 4.17 73		
6.1.5 Senior officials and managers..... 13.01 84		
6.1.6 Availability of scientists and engineers..... 52.76 57		
6.2 Talent Impact..... 17.32 81		
6.2.1 Innovation output..... 22.24 87		
6.2.2 High-value exports..... 6.34 96		
6.2.3 New product entrepreneurial activity..... 56.03 31		
6.2.4 New business density..... 0.24 104		
6.2.5 Scientific journal articles..... 1.75 86		

PANAMA

Key Indicators

Rank (out of 132).....	62
Income group.....	High income
Regional group.....	Latin America and the Caribbean
Population (millions).....	4.18

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	50.05	57
1.1 Regulatory Landscape.....	52.52	57
1.1.1 Government effectiveness.....	46.74	71
1.1.2 Rule of law.....	53.56	63
1.1.3 Political stability.....	73.62	44
1.1.4 Regulatory quality.....	57.59	53
1.1.5 Corruption.....	31.08	77
1.2 Market Landscape.....	49.57	68
1.2.1 Competition intensity.....	72.33	52
1.2.2 Ease of doing business.....	63.43	73
1.2.3 Cluster development.....	43.42	63
1.2.4 R&D expenditure.....	1.04	114
1.2.5 ICT infrastructure.....	54.33	69
1.2.6 Urban population.....	62.87	59
1.3 Business and Labour Landscape.....	48.08	60
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	89.53	27
1.3.2 Active labour market policies.....	32.99	81
1.3.3 Labour-employer cooperation.....	35.22	78
1.3.4 Management Practice		
1.3.4 Professional management.....	47.88	69
1.3.5 Relationship of pay to productivity.....	30.56	118
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	59.96	49
1.3.7 Investment in emerging technologies.....	40.39	61
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	65.15	25
2.1 External Openness.....	66.56	16
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	77.33	22
2.1.2 Prevalence of foreign ownership.....	80.04	20
2.1.3 Attract People		
2.1.3 Migrant stock.....	44.21	58
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	64.66	26
2.2 Internal Openness.....	63.74	44
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	48.89	60
2.2.2 Tolerance of immigrants.....	56.16	74
2.2.3 Social mobility.....	52.26	78
2.2.4 Gender Equality		
2.2.4 Female graduates.....	96.70	3
2.2.5 Gender development gap.....	84.80	34
2.2.6 Leadership opportunities for women.....	43.63	73

GDP per capita (PPP US\$).....	25,508.63
GDP (US\$ billions).....	65.06
GTCI score.....	43.14
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	33.10	85
3.1 Formal Education.....	21.89	75
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	24.07	50
3.1.2 Tertiary enrolment.....	37.02	62
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	14.76	81
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	26.37	125
3.2.1 Quality of management schools.....	35.12	104
3.2.2 Prevalence of training in firms.....	10.03	92
3.2.3 Employee development.....	33.97	80
3.3 Access to Growth Opportunities.....	51.02	50
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	44.26	70
3.3.2 Personal rights.....	84.52	43
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	81.82	41
3.3.4 Use of virtual professional networks.....	15.11	46
3.3.5 Collaboration within organisations.....	42.75	87
3.3.6 Collaboration across organisations.....	37.68	75

4 RETAIN.....	53.02	58
4.1 Sustainability.....	52.26	44
4.1.1 Pension system.....	48.73	56
4.1.2 Social protection.....	46.48	56
4.1.3 Brain retention.....	61.58	33
4.2 Lifestyle.....	53.78	69
4.2.1 Environmental performance.....	58.81	50
4.2.2 Personal safety.....	55.96	63
4.2.3 Physician density.....	25.26	71
4.2.4 Sanitation.....	75.10	88

5 VOCATIONAL AND TECHNICAL SKILLS.....	37.36	83
5.1 Mid-Level Skills.....	37.94	68
5.1.1 Workforce with secondary education.....	51.14	57
5.1.2 Population with secondary education.....	29.47	76
5.1.3 Technicians and associate professionals.....	33.22	63
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	36.79	103
5.2.1 Ease of finding skilled employees.....	36.01	113
5.2.2 Relevance of education system to the economy.....	24.63	113
5.2.3 Skills matching with secondary education.....	36.63	79
5.2.4 Skills matching with tertiary education.....	49.88	77

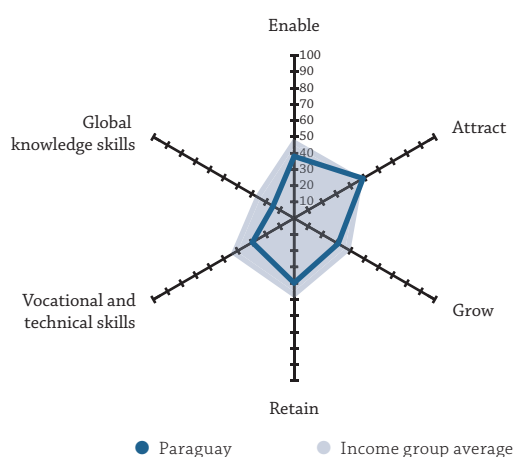
6 GLOBAL KNOWLEDGE SKILLS.....	20.17	82
6.1 High-Level Skills.....	27.35	71
6.1.1 Workforce with tertiary education.....	23.18	79
6.1.2 Population with tertiary education.....	33.31	46
6.1.3 Professionals.....	27.96	63
6.1.4 Researchers.....	0.35	98
6.1.5 Senior officials and managers.....	32.66	44
6.1.6 Availability of scientists and engineers.....	46.66	68
6.2 Talent Impact.....	13.00	95
6.2.1 Innovation output.....	27.15	71
6.2.2 High-value exports.....	17.04	64
6.2.3 New product entrepreneurial activity.....	15.28	84
6.2.4 New business density.....	3.98	75
6.2.5 Scientific journal articles.....	1.52	87

PARAGUAY

Key Indicators

Rank (out of 132).....	99
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	6.96

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	38.08	101
1.1 Regulatory Landscape.....	38.92	96
1.1.1 Government effectiveness.....	26.85	117
1.1.2 Rule of law.....	37.46	104
1.1.3 Political stability.....	67.60	60
1.1.4 Regulatory quality.....	42.41	87
1.1.5 Corruption.....	20.27	107
1.2 Market Landscape.....	38.55	101
1.2.1 Competition intensity.....	63.85	78
1.2.2 Ease of doing business.....	51.43	96
1.2.3 Cluster development.....	22.42	115
1.2.4 R&D expenditure.....	3.05	95
1.2.5 ICT infrastructure.....	34.73	95
1.2.6 Urban population.....	55.83	71
1.3 Business and Labour Landscape.....	36.78	100
Labour Market		
1.3.1 Tertiary-educated unemployment.....	91.00	20
1.3.2 Active labour market policies.....	14.93	114
1.3.3 Labour-employer cooperation.....	31.58	89
Management Practice		
1.3.4 Professional management.....	29.44	112
1.3.5 Relationship of pay to productivity.....	32.56	112
Technology Adoption		
1.3.6 Technology utilisation.....	38.89	100
1.3.7 Investment in emerging technologies.....	19.09	120
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	48.97	64
2.1 External Openness.....	43.30	66
Attract Business		
2.1.1 FDI and technology transfer.....	45.61	99
2.1.2 Prevalence of foreign ownership.....	55.11	74
Attract People		
2.1.3 Migrant stock.....	32.29	78
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	40.18	81
2.2 Internal Openness.....	54.63	70
Social Inclusion		
2.2.1 Tolerance of minorities.....	53.33	50
2.2.2 Tolerance of immigrants.....	75.34	30
2.2.3 Social mobility.....	50.21	87
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	78.80	59
2.2.6 Leadership opportunities for women.....	15.48	126

GDP per capita (PPP US\$).....	13,570.86
GDP (US\$ billions).....	40.84
GTGI score.....	33.80
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	31.31	94
3.1 Formal Education.....	21.88	76
Enrolment		
3.1.1 Vocational enrolment.....	24.49	47
3.1.2 Tertiary enrolment.....	27.31	74
Quality		
3.1.3 Tertiary education expenditure.....	23.99	52
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	34.39	99
3.2.1 Quality of management schools.....	20.38	126
3.2.2 Prevalence of training in firms.....	56.73	24
3.2.3 Employee development.....	26.07	106
3.3 Access to Growth Opportunities.....	37.65	106
Empowerment		
3.3.1 Delegation of authority.....	23.43	121
3.3.2 Personal rights.....	74.56	64
Collaboration		
3.3.3 Use of virtual social networks.....	67.86	85
3.3.4 Use of virtual professional networks.....	4.69	85
3.3.5 Collaboration within organisations.....	28.78	119
3.3.6 Collaboration across organisations.....	26.58	103

4 RETAIN.....	39.81	90
4.1 Sustainability.....	28.59	102
4.1.1 Pension system.....	18.90	81
4.1.2 Social protection.....	25.03	109
4.1.3 Brain retention.....	41.84	61
4.2 Lifestyle.....	51.03	77
4.2.1 Environmental performance.....	44.17	86
4.2.2 Personal safety.....	49.09	77
4.2.3 Physician density.....	20.32	77
4.2.4 Sanitation.....	90.55	68

5 VOCATIONAL AND TECHNICAL SKILLS.....	29.65	109
5.1 Mid-Level Skills.....	34.02	74
5.1.1 Workforce with secondary education.....	38.72	76
5.1.2 Population with secondary education.....	30.98	70
5.1.3 Technicians and associate professionals.....	32.37	66
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	25.27	126
5.2.1 Ease of finding skilled employees.....	30.08	128
5.2.2 Relevance of education system to the economy.....	10.26	131
5.2.3 Skills matching with secondary education.....	25.40	116
5.2.4 Skills matching with tertiary education.....	35.36	118

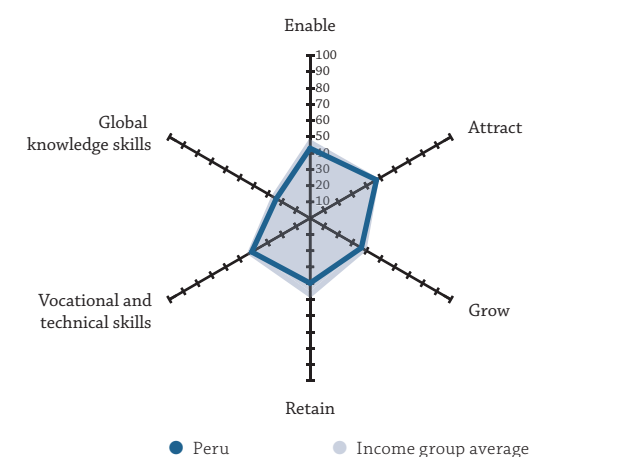
6 GLOBAL KNOWLEDGE SKILLS.....	14.96	102
6.1 High-Level Skills.....	17.28	101
6.1.1 Workforce with tertiary education.....	21.42	83
6.1.2 Population with tertiary education.....	21.29	70
6.1.3 Professionals.....	16.34	93
6.1.4 Researchers.....	1.35	85
6.1.5 Senior officials and managers.....	25.29	60
6.1.6 Availability of scientists and engineers.....	18.01	128
6.2 Talent Impact.....	12.63	96
6.2.1 Innovation output.....	20.67	92
6.2.2 High-value exports.....	28.70	42
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	0.65	96
6.2.5 Scientific journal articles.....	0.52	107

PERU

Key Indicators

Rank (out of 132).....	77
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	31.99

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	43.06	87
1.1 Regulatory Landscape.....	46.11	75
1.1.1 Government effectiveness.....	43.44	80
1.1.2 Rule of law.....	40.96	98
1.1.3 Political stability.....	59.40	80
1.1.4 Regulatory quality.....	58.35	51
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	48.82	72
1.2.1 Competition intensity.....	75.42	41
1.2.2 Ease of doing business.....	68.27	63
1.2.3 Cluster development.....	31.33	96
1.2.4 R&D expenditure.....	2.32	102
1.2.5 ICT infrastructure.....	40.97	83
1.2.6 Urban population.....	74.60	38
1.3 Business and Labour Landscape.....	34.26	108
Labour Market		
1.3.1 Tertiary-educated unemployment.....	84.23	51
1.3.2 Active labour market policies.....	12.66	121
1.3.3 Labour-employer cooperation.....	27.77	97
Management Practice		
1.3.4 Professional management.....	44.75	80
1.3.5 Relationship of pay to productivity.....	38.36	93
Technology Adoption		
1.3.6 Technology utilisation.....	40.97	95
1.3.7 Investment in emerging technologies.....	25.15	107
1.3.8 Robot density.....	0.19	61
2 ATTRACT.....	47.15	75
2.1 External Openness.....	43.20	67
Attract Business		
2.1.1 FDI and technology transfer.....	58.52	62
2.1.2 Prevalence of foreign ownership.....	65.73	50
Attract People		
2.1.3 Migrant stock.....	5.28	124
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	43.29	67
2.2 Internal Openness.....	51.10	93
Social Inclusion		
2.2.1 Tolerance of minorities.....	22.22	103
2.2.2 Tolerance of immigrants.....	67.12	46
2.2.3 Social mobility.....	51.59	82
Gender Equality		
2.2.4 Female graduates.....	72.90	62
2.2.5 Gender development gap.....	71.04	83
2.2.6 Leadership opportunities for women.....	21.71	117

GDP per capita (PPP US\$).....	14,393.45
GDP (US\$ billions).....	222.24
GTCI score.....	38.68
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	36.43	76
3.1 Formal Education.....	22.68	73
Enrolment		
3.1.1 Vocational enrolment.....	3.00	107
3.1.2 Tertiary enrolment.....	54.81	27
Quality		
3.1.3 Tertiary education expenditure.....	13.66	87
3.1.4 Reading, maths, and science.....	25.67	63
3.1.5 University ranking.....	16.26	56
3.2 Lifelong Learning.....	47.09	53
3.2.1 Quality of management schools.....	38.04	92
3.2.2 Prevalence of training in firms.....	82.45	4
3.2.3 Employee development.....	20.77	120
3.3 Access to Growth Opportunities.....	39.53	100
Empowerment		
3.3.1 Delegation of authority.....	37.39	90
3.3.2 Personal rights.....	76.49	63
Collaboration		
3.3.3 Use of virtual social networks.....	66.43	89
3.3.4 Use of virtual professional networks.....	0.90	114
3.3.5 Collaboration within organisations.....	30.49	116
3.3.6 Collaboration across organisations.....	25.49	107

4 RETAIN.....	39.93	89
4.1 Sustainability.....	30.95	97
4.1.1 Pension system.....	24.28	77
4.1.2 Social protection.....	28.64	103
4.1.3 Brain retention.....	39.92	67
4.2 Lifestyle.....	48.90	85
4.2.1 Environmental performance.....	57.49	57
4.2.2 Personal safety.....	45.48	84
4.2.3 Physician density.....	17.59	81
4.2.4 Sanitation.....	75.05	89

5 VOCATIONAL AND TECHNICAL SKILLS.....	41.44	72
5.1 Mid-Level Skills.....	47.49	53
5.1.1 Workforce with secondary education.....	71.78	23
5.1.2 Population with secondary education.....	48.93	46
5.1.3 Technicians and associate professionals.....	54.45	36
5.1.4 Labour productivity per employee.....	14.79	76
5.2 Employability.....	35.40	108
5.2.1 Ease of finding skilled employees.....	42.34	101
5.2.2 Relevance of education system to the economy.....	19.99	122
5.2.3 Skills matching with secondary education.....	31.02	102
5.2.4 Skills matching with tertiary education.....	48.24	81

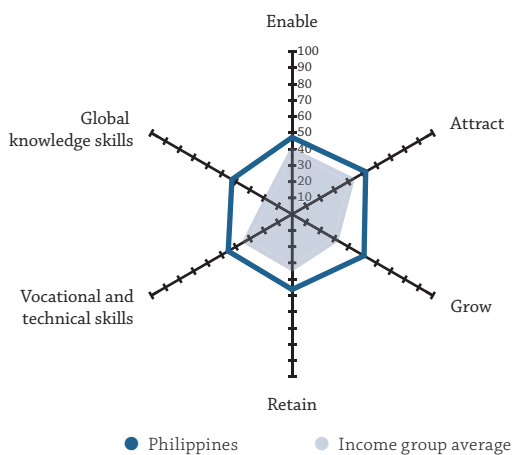
6 GLOBAL KNOWLEDGE SKILLS.....	24.04	73
6.1 High-Level Skills.....	28.80	69
6.1.1 Workforce with tertiary education.....	44.79	38
6.1.2 Population with tertiary education.....	32.52	49
6.1.3 Professionals.....	28.74	61
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	2.53	121
6.1.6 Availability of scientists and engineers.....	35.41	104
6.2 Talent Impact.....	19.29	74
6.2.1 Innovation output.....	22.77	84
6.2.2 High-value exports.....	13.86	76
6.2.3 New product entrepreneurial activity.....	41.13	54
6.2.4 New business density.....	17.45	34
6.2.5 Scientific journal articles.....	1.25	90

PHILIPPINES

Key Indicators

Rank (out of 132).....	46
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	106.65

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.29 68		
1.1 Regulatory Landscape.....40.83 91		
1.1.1 Government effectiveness.....45.02 74		
1.1.2 Rule of law.....42.98 93		
1.1.3 Political stability.....37.86 121		
1.1.4 Regulatory quality.....48.55 68		
1.1.5 Corruption.....29.73 81		
1.2 Market Landscape.....43.25 86		
1.2.1 Competition intensity.....79.66 25		
1.2.2 Ease of doing business.....48.36 104		
1.2.3 Cluster development.....49.25 46		
1.2.4 R&D expenditure.....2.70 97		
1.2.5 ICT infrastructure.....40.59 85		
1.2.6 Urban population.....38.95 101		
1.3 Business and Labour Landscape.....57.78 36		
Labour Market		
1.3.1 Tertiary-educated unemployment.....75.28 82		
1.3.2 Active labour market policies.....50.00 55		
1.3.3 Labour-employer cooperation.....65.00 22		
Management Practice		
1.3.4 Professional management.....66.91 29		
1.3.5 Relationship of pay to productivity.....76.92 10		
Technology Adoption		
1.3.6 Technology utilisation.....65.86 39		
1.3.7 Investment in emerging technologies.....61.10 30		
1.3.8 Robot density.....1.18 50		
2 ATTRACT.....52.29 55		
2.1 External Openness.....36.66 89		
Attract Business		
2.1.1 FDI and technology transfer.....71.65 34		
2.1.2 Prevalence of foreign ownership.....51.72 87		
Attract People		
2.1.3 Migrant stock.....4.03 127		
2.1.4 International students.....0.27 107		
2.1.5 Brain gain.....55.64 38		
2.2 Internal Openness.....67.91 29		
Social Inclusion		
2.2.1 Tolerance of minorities.....23.33 100		
2.2.2 Tolerance of immigrants.....60.27 60		
2.2.3 Social mobility.....64.39 42		
Gender Equality		
2.2.4 Female graduates.....76.92 47		
2.2.5 Gender development gap.....88.99 19		
2.2.6 Leadership opportunities for women.....93.55 3		

GDP per capita (PPP US\$).....	8,935.30
GDP (US\$ billions).....	330.91
GTCI score.....	47.52
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....51.12 34		
3.1 Formal Education.....16.99 88		
Enrolment		
3.1.1 Vocational enrolment.....n/a n/a		
3.1.2 Tertiary enrolment.....27.47 73		
Quality		
3.1.3 Tertiary education expenditure.....4.96 109		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....18.55 52		
3.2 Lifelong Learning.....72.39 17		
3.2.1 Quality of management schools.....75.55 16		
3.2.2 Prevalence of training in firms.....74.41 7		
3.2.3 Employee development.....67.20 24		
3.3 Access to Growth Opportunities.....63.97 24		
Empowerment		
3.3.1 Delegation of authority.....64.09 29		
3.3.2 Personal rights.....72.54 69		
Collaboration		
3.3.3 Use of virtual social networks.....96.80 5		
3.3.4 Use of virtual professional networks.....11.48 55		
3.3.5 Collaboration within organisations.....76.67 21		
3.3.6 Collaboration across organisations.....62.27 22		
4 RETAIN.....46.33 69		
4.1 Sustainability.....42.56 66		
4.1.1 Pension system.....30.86 68		
4.1.2 Social protection.....40.76 72		
4.1.3 Brain retention.....56.06 40		
4.2 Lifestyle.....50.10 81		
4.2.1 Environmental performance.....50.38 70		
4.2.2 Personal safety.....26.85 116		
4.2.3 Physician density.....n/a n/a		
4.2.4 Sanitation.....73.07 92		
5 VOCATIONAL AND TECHNICAL SKILLS.....45.37 61		
5.1 Mid-Level Skills.....19.90 101		
5.1.1 Workforce with secondary education.....5.77 121		
5.1.2 Population with secondary education.....44.30 57		
5.1.3 Technicians and associate professionals.....16.86 100		
5.1.4 Labour productivity per employee.....12.67 81		
5.2 Employability.....70.84 20		
5.2.1 Ease of finding skilled employees.....76.50 18		
5.2.2 Relevance of education system to the economy.....67.66 21		
5.2.3 Skills matching with secondary education.....60.80 31		
5.2.4 Skills matching with tertiary education.....78.40 19		
6 GLOBAL KNOWLEDGE SKILLS.....42.75 32		
6.1 High-Level Skills.....43.84 37		
6.1.1 Workforce with tertiary education.....38.12 50		
6.1.2 Population with tertiary education.....41.90 34		
6.1.3 Professionals.....13.54 101		
6.1.4 Researchers.....2.15 80		
6.1.5 Senior officials and managers.....100.00 1		
6.1.6 Availability of scientists and engineers.....67.32 30		
6.2 Talent Impact.....41.65 29		
6.2.1 Innovation output.....42.56 41		
6.2.2 High-value exports.....100.00 1		
6.2.3 New product entrepreneurial activity.....63.60 18		
6.2.4 New business density.....1.55 91		
6.2.5 Scientific journal articles.....0.56 105		

POLAND

Key Indicators

Rank (out of 132).....	44
Income group.....	High income
Regional group.....	Europe
Population (millions).....	37.98

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	57.45	43
1.1 Regulatory Landscape.....	66.79	38
1.1.1 Government effectiveness.....	61.92	39
1.1.2 Rule of law.....	63.70	42
1.1.3 Political stability.....	76.46	38
1.1.4 Regulatory quality.....	69.73	35
1.1.5 Corruption.....	62.16	31
1.2 Market Landscape.....	58.23	45
1.2.1 Competition intensity.....	71.54	57
1.2.2 Ease of doing business.....	82.78	31
1.2.3 Cluster development.....	43.51	62
1.2.4 R&D expenditure.....	22.44	35
1.2.5 ICT infrastructure.....	75.06	34
1.2.6 Urban population.....	54.07	74
1.3 Business and Labour Landscape.....	47.31	63
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	93.50	10
1.3.2 Active labour market policies.....	45.46	62
1.3.3 Labour-employer cooperation.....	35.63	75
1.3.4 Management Practice		
1.3.4 Professional management.....	46.57	72
1.3.5 Relationship of pay to productivity.....	54.41	54
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	53.14	61
1.3.7 Investment in emerging technologies.....	37.21	70
1.3.8 Robot density.....	12.54	30
2 ATTRACT.....	47.92	72
2.1 External Openness.....	38.61	81
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	66.28	45
2.1.2 Prevalence of foreign ownership.....	65.17	51
2.1.3 Attract People		
2.1.3 Migrant stock.....	22.62	95
2.1.4 International students.....	12.47	54
2.1.5 Brain gain.....	26.52	107
2.2 Internal Openness.....	57.22	60
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	42.22	74
2.2.2 Tolerance of immigrants.....	21.92	117
2.2.3 Social mobility.....	55.88	71
2.2.4 Gender Equality		
2.2.4 Female graduates.....	94.88	6
2.2.5 Gender development gap.....	91.11	12
2.2.6 Leadership opportunities for women.....	37.33	89

GDP per capita (PPP US\$).....	32,356.52
GDP (US\$ billions).....	585.78
GTCI score.....	49.48
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	43.62	49
3.1 Formal Education.....	46.17	26
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	43.80	21
3.1.2 Tertiary enrolment.....	52.37	33
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	28.20	39
3.1.4 Reading, maths, and science.....	77.54	16
3.1.5 University ranking.....	28.94	42
3.2 Lifelong Learning.....	42.24	69
3.2.1 Quality of management schools.....	45.02	76
3.2.2 Prevalence of training in firms.....	41.16	42
3.2.3 Employee development.....	40.54	62
3.3 Access to Growth Opportunities.....	42.44	88
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	39.41	86
3.3.2 Personal rights.....	83.21	47
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	73.84	65
3.3.4 Use of virtual professional networks.....	6.75	73
3.3.5 Collaboration within organisations.....	28.49	121
3.3.6 Collaboration across organisations.....	22.94	114

4 RETAIN.....	58.75	44
4.1 Sustainability.....	47.79	50
4.1.1 Pension system.....	88.00	18
4.1.2 Social protection.....	20.63	117
4.1.3 Brain retention.....	34.74	83
4.2 Lifestyle.....	69.72	35
4.2.1 Environmental performance.....	61.14	45
4.2.2 Personal safety.....	83.32	20
4.2.3 Physician density.....	36.42	54
4.2.4 Sanitation.....	97.99	37

5 VOCATIONAL AND TECHNICAL SKILLS.....	54.31	40
5.1 Mid-Level Skills.....	66.77	9
5.1.1 Workforce with secondary education.....	81.06	12
5.1.2 Population with secondary education.....	84.35	6
5.1.3 Technicians and associate professionals.....	58.11	28
5.1.4 Labour productivity per employee.....	43.54	33
5.2 Employability.....	41.86	88
5.2.1 Ease of finding skilled employees.....	56.15	63
5.2.2 Relevance of education system to the economy.....	40.55	77
5.2.3 Skills matching with secondary education.....	29.50	106
5.2.4 Skills matching with tertiary education.....	41.25	103

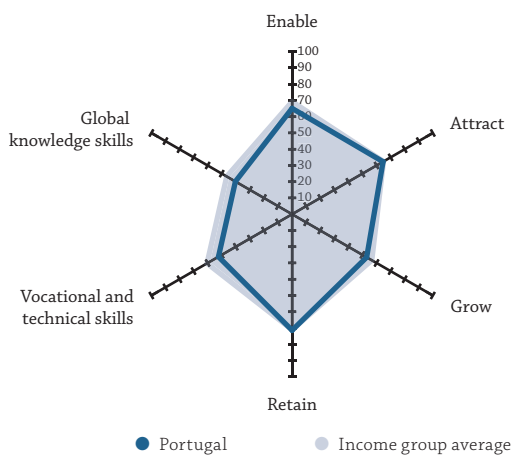
6 GLOBAL KNOWLEDGE SKILLS.....	34.84	45
6.1 High-Level Skills.....	43.90	36
6.1.1 Workforce with tertiary education.....	52.29	28
6.1.2 Population with tertiary education.....	39.35	37
6.1.3 Professionals.....	52.16	22
6.1.4 Researchers.....	30.55	33
6.1.5 Senior officials and managers.....	37.53	37
6.1.6 Availability of scientists and engineers.....	51.55	61
6.2 Talent Impact.....	25.77	54
6.2.1 Innovation output.....	44.31	40
6.2.2 High-value exports.....	23.03	50
6.2.3 New product entrepreneurial activity.....	19.13	81
6.2.4 New business density.....	7.97	57
6.2.5 Scientific journal articles.....	34.39	31

PORTUGAL

Key Indicators

Rank (out of 132).....	28
Income group	High income
Regional group	Europe
Population (millions)	10.28

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....65.14	29	
1.1 Regulatory Landscape.....	76.92	22
1.1.1 Government effectiveness.....	78.83	21
1.1.2 Rule of law.....	79.10	24
1.1.3 Political stability.....	88.71	12
1.1.4 Regulatory quality.....	70.39	34
1.1.5 Corruption.....	67.57	26
1.2 Market Landscape.....	63.12	32
1.2.1 Competition intensity.....	71.78	54
1.2.2 Ease of doing business.....	82.07	32
1.2.3 Cluster development.....	56.82	36
1.2.4 R&D expenditure.....	28.78	26
1.2.5 ICT infrastructure.....	79.26	27
1.2.6 Urban population.....	60.00	66
1.3 Business and Labour Landscape.....	55.39	44
Labour Market		
1.3.1 Tertiary-educated unemployment.....	82.35	58
1.3.2 Active labour market policies.....	62.35	36
1.3.3 Labour-employer cooperation.....	47.24	48
Management Practice		
1.3.4 Professional management.....	52.67	59
1.3.5 Relationship of pay to productivity.....	49.24	64
Technology Adoption		
1.3.6 Technology utilisation.....	76.21	24
1.3.7 Investment in emerging technologies.....	52.88	38
1.3.8 Robot density.....	20.21	24
2 ATTRACT.....64.63	26	
2.1 External Openness.....	53.87	33
Attract Business		
2.1.1 FDI and technology transfer.....	81.00	16
2.1.2 Prevalence of foreign ownership.....	68.69	45
Attract People		
2.1.3 Migrant stock.....	51.70	48
2.1.4 International students.....	18.30	38
2.1.5 Brain gain.....	49.66	47
2.2 Internal Openness.....	75.40	19
Social Inclusion		
2.2.1 Tolerance of minorities.....	90.00	5
2.2.2 Tolerance of immigrants.....	95.89	4
2.2.3 Social mobility.....	63.80	45
Gender Equality		
2.2.4 Female graduates.....	77.07	46
2.2.5 Gender development gap.....	82.95	44
2.2.6 Leadership opportunities for women.....	42.67	75

GDP per capita (PPP US\$)	34,065.21
GDP (US\$ billions)	237.98
GTCI score.....	57.80
GTCI score (income group average)	61.46

	Score	Rank
3 GROW.....52.99	32	
3.1 Formal Education.....	42.85	34
Enrolment		
3.1.1 Vocational enrolment.....	39.89	26
3.1.2 Tertiary enrolment.....	49.49	40
Quality		
3.1.3 Tertiary education expenditure.....	19.85	65
3.1.4 Reading, maths, and science.....	74.28	21
3.1.5 University ranking.....	30.73	39
3.2 Lifelong Learning.....	57.14	33
3.2.1 Quality of management schools.....	68.92	28
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	45.37	56
3.3 Access to Growth Opportunities.....	58.97	31
Empowerment		
3.3.1 Delegation of authority.....	45.11	68
3.3.2 Personal rights.....	98.80	2
Collaboration		
3.3.3 Use of virtual social networks.....	79.94	51
3.3.4 Use of virtual professional networks.....	32.84	20
3.3.5 Collaboration within organisations.....	49.14	60
3.3.6 Collaboration across organisations.....	48.00	40

4 RETAIN.....71.44	25	
4.1 Sustainability.....	60.11	35
4.1.1 Pension system.....	74.50	33
4.1.2 Social protection.....	66.06	32
4.1.3 Brain retention.....	39.76	69
4.2 Lifestyle.....	82.78	9
4.2.1 Environmental performance.....	74.15	25
4.2.2 Personal safety.....	86.90	13
4.2.3 Physician density.....	70.67	4
4.2.4 Sanitation.....	99.40	23

5 VOCATIONAL AND TECHNICAL SKILLS.....52.31	43	
5.1 Mid-Level Skills.....	37.02	72
5.1.1 Workforce with secondary education.....	36.68	78
5.1.2 Population with secondary education.....	24.09	88
5.1.3 Technicians and associate professionals.....	49.29	44
5.1.4 Labour productivity per employee.....	38.03	44
5.2 Employability.....	67.59	26
5.2.1 Ease of finding skilled employees.....	71.36	28
5.2.2 Relevance of education system to the economy.....	62.08	34
5.2.3 Skills matching with secondary education.....	66.35	23
5.2.4 Skills matching with tertiary education.....	70.59	30

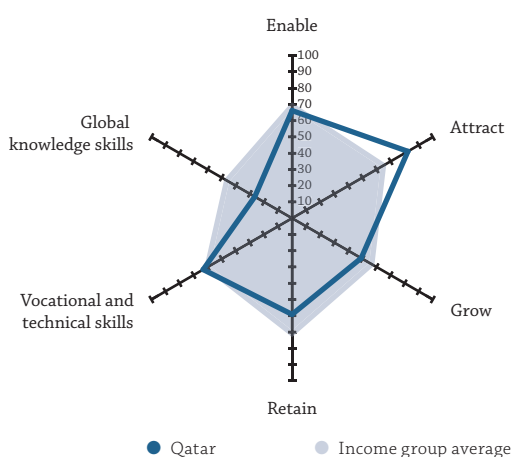
6 GLOBAL KNOWLEDGE SKILLS.....40.27	35	
6.1 High-Level Skills.....	44.92	33
6.1.1 Workforce with tertiary education.....	39.38	47
6.1.2 Population with tertiary education.....	29.44	57
6.1.3 Professionals.....	49.35	26
6.1.4 Researchers.....	51.95	20
6.1.5 Senior officials and managers.....	33.51	41
6.1.6 Availability of scientists and engineers.....	65.91	31
6.2 Talent Impact.....	35.62	38
6.2.1 Innovation output.....	49.39	34
6.2.2 High-value exports.....	12.65	80
6.2.3 New product entrepreneurial activity.....	39.09	56
6.2.4 New business density.....	24.11	25
6.2.5 Scientific journal articles.....	52.85	20

QATAR

Key Indicators

Rank (out of 132).....	29
Income group.....	High income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	2.78

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 66.23 28		
1.1 Regulatory Landscape.....	66.87	37
1.1.1 Government effectiveness.....	64.55	38
1.1.2 Rule of law.....	69.56	34
1.1.3 Political stability.....	77.01	37
1.1.4 Regulatory quality.....	58.35	50
1.1.5 Corruption.....	64.86	28
1.2 Market Landscape.....	65.43	29
1.2.1 Competition intensity.....	64.26	76
1.2.2 Ease of doing business.....	63.02	77
1.2.3 Cluster development.....	76.29	14
1.2.4 R&D expenditure.....	10.85	63
1.2.5 ICT infrastructure.....	79.13	29
1.2.6 Urban population.....	99.01	3
1.3 Business and Labour Landscape.....	66.41	25
Labour Market		
1.3.1 Tertiary-educated unemployment.....	98.26	2
1.3.2 Active labour market policies.....	75.92	20
1.3.3 Labour-employer cooperation.....	63.83	26
Management Practice		
1.3.4 Professional management.....	75.11	25
1.3.5 Relationship of pay to productivity.....	77.15	9
Technology Adoption		
1.3.6 Technology utilisation.....	69.73	33
1.3.7 Investment in emerging technologies.....	71.18	16
1.3.8 Robot density.....	0.10	65
2 ATTRACT..... 82.28 4		
2.1 External Openness.....	81.80	5
Attract Business		
2.1.1 FDI and technology transfer.....	73.66	27
2.1.2 Prevalence of foreign ownership.....	60.51	61
Attract People		
2.1.3 Migrant stock.....	93.95	3
2.1.4 International students.....	100.00	1
2.1.5 Brain gain.....	80.87	8
2.2 Internal Openness.....	82.76	6
Social Inclusion		
2.2.1 Tolerance of minorities.....	66.67	33
2.2.2 Tolerance of immigrants.....	86.30	14
2.2.3 Social mobility.....	76.50	25
Gender Equality		
2.2.4 Female graduates.....	96.66	4
2.2.5 Gender development gap.....	100.00	1
2.2.6 Leadership opportunities for women.....	70.43	24

GDP per capita (PPP US\$).....	126,597.64
GDP (US\$ billions).....	192.01
GTCI score.....	57.74
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW..... 49.10 36		
3.1 Formal Education.....	20.46	77
Enrolment		
3.1.1 Vocational enrolment.....	0.95	113
3.1.2 Tertiary enrolment.....	12.45	97
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	32.11	58
3.1.5 University ranking.....	36.31	32
3.2 Lifelong Learning.....	70.46	23
3.2.1 Quality of management schools.....	75.31	19
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	65.61	25
3.3 Access to Growth Opportunities.....	56.40	37
Empowerment		
3.3.1 Delegation of authority.....	72.84	22
3.3.2 Personal rights.....	22.39	123
Collaboration		
3.3.3 Use of virtual social networks.....	73.56	66
3.3.4 Use of virtual professional networks.....	19.39	33
3.3.5 Collaboration within organisations.....	77.81	17
3.3.6 Collaboration across organisations.....	72.40	11

4 RETAIN..... 59.18 41		
4.1 Sustainability.....	50.51	46
4.1.1 Pension system.....	3.90	109
4.1.2 Social protection.....	71.38	25
4.1.3 Brain retention.....	76.26	17
4.2 Lifestyle.....	67.84	40
4.2.1 Environmental performance.....	67.29	31
4.2.2 Personal safety.....	72.87	31
4.2.3 Physician density.....	31.19	58
4.2.4 Sanitation.....	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS..... 63.16 22		
5.1 Mid-Level Skills.....	48.39	51
5.1.1 Workforce with secondary education.....	34.10	82
5.1.2 Population with secondary education.....	30.34	72
5.1.3 Technicians and associate professionals.....	29.12	73
5.1.4 Labour productivity per employee.....	100.00	1
5.2 Employability.....	77.92	12
5.2.1 Ease of finding skilled employees.....	81.03	11
5.2.2 Relevance of education system to the economy.....	80.88	9
5.2.3 Skills matching with secondary education.....	68.36	18
5.2.4 Skills matching with tertiary education.....	81.43	15

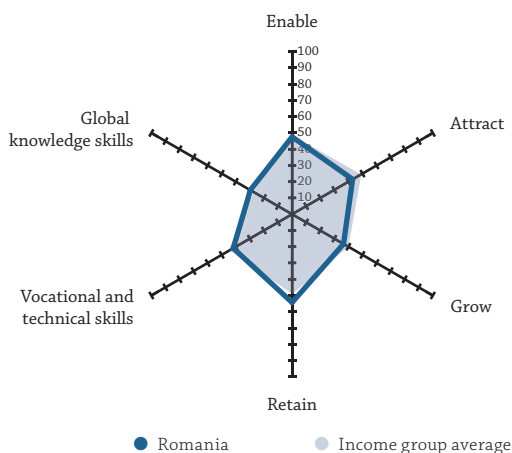
6 GLOBAL KNOWLEDGE SKILLS..... 26.50 67		
6.1 High-Level Skills.....	30.15	63
6.1.1 Workforce with tertiary education.....	26.88	73
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	23.20	73
6.1.4 Researchers.....	7.20	63
6.1.5 Senior officials and managers.....	12.24	86
6.1.6 Availability of scientists and engineers.....	81.22	8
6.2 Talent Impact.....	22.85	65
6.2.1 Innovation output.....	27.50	68
6.2.2 High-value exports.....	6.54	95
6.2.3 New product entrepreneurial activity.....	52.54	41
6.2.4 New business density.....	8.14	55
6.2.5 Scientific journal articles.....	19.54	43

ROMANIA

Key Indicators

Rank (out of 132).....	64
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	19.47

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.61	66	
1.1 Regulatory Landscape.....	55.00	53
1.1.1 Government effectiveness.....	42.34	85
1.1.2 Rule of law.....	61.71	48
1.1.3 Political stability.....	66.27	64
1.1.4 Regulatory quality.....	60.07	45
1.1.5 Corruption.....	44.59	52
1.2 Market Landscape.....	46.93	75
1.2.1 Competition intensity.....	59.24	92
1.2.2 Ease of doing business.....	74.47	48
1.2.3 Cluster development.....	22.64	113
1.2.4 R&D expenditure.....	10.71	64
1.2.5 ICT infrastructure.....	67.43	53
1.2.6 Urban population.....	47.10	90
1.3 Business and Labour Landscape.....	40.89	84
Labour Market		
1.3.1 Tertiary-educated unemployment.....	93.07	11
1.3.2 Active labour market policies.....	52.04	50
1.3.3 Labour-employer cooperation.....	38.81	65
Management Practice		
1.3.4 Professional management.....	32.87	103
1.3.5 Relationship of pay to productivity.....	35.46	105
Technology Adoption		
1.3.6 Technology utilisation.....	37.49	103
1.3.7 Investment in emerging technologies.....	31.16	93
1.3.8 Robot density.....	6.25	37
2 ATTRACT.....42.99	95	
2.1 External Openness.....	31.58	106
Attract Business		
2.1.1 FDI and technology transfer.....	50.58	86
2.1.2 Prevalence of foreign ownership.....	60.91	59
Attract People		
2.1.3 Migrant stock.....	17.48	104
2.1.4 International students.....	17.64	40
2.1.5 Brain gain.....	11.31	127
2.2 Internal Openness.....	54.40	74
Social Inclusion		
2.2.1 Tolerance of minorities.....	42.22	74
2.2.2 Tolerance of immigrants.....	17.81	120
2.2.3 Social mobility.....	39.65	120
Gender Equality		
2.2.4 Female graduates.....	76.77	48
2.2.5 Gender development gap.....	83.39	41
2.2.6 Leadership opportunities for women.....	66.57	29

GDP per capita (PPP US\$).....	26,595.43
GDP (US\$ billions).....	239.55
GTCI score.....	42.14
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....36.54	74	
3.1 Formal Education.....	30.39	54
Enrolment		
3.1.1 Vocational enrolment.....	42.57	24
3.1.2 Tertiary enrolment.....	37.62	59
Quality		
3.1.3 Tertiary education expenditure.....	13.74	85
3.1.4 Reading, maths, and science.....	46.31	45
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	34.43	97
3.2.1 Quality of management schools.....	30.35	112
3.2.2 Prevalence of training in firms.....	49.21	31
3.2.3 Employee development.....	23.73	117
3.3 Access to Growth Opportunities.....	44.81	77
Empowerment		
3.3.1 Delegation of authority.....	32.87	104
3.3.2 Personal rights.....	83.85	45
Collaboration		
3.3.3 Use of virtual social networks.....	80.78	48
3.3.4 Use of virtual professional networks.....	18.70	34
3.3.5 Collaboration within organisations.....	27.70	124
3.3.6 Collaboration across organisations.....	24.98	108
4 RETAIN.....54.29	54	
4.1 Sustainability.....	44.75	58
4.1.1 Pension system.....	64.57	43
4.1.2 Social protection.....	65.38	33
4.1.3 Brain retention.....	4.31	130
4.2 Lifestyle.....	63.82	45
4.2.1 Environmental performance.....	62.26	40
4.2.2 Personal safety.....	70.09	36
4.2.3 Physician density.....	42.50	44
4.2.4 Sanitation.....	80.43	84
5 VOCATIONAL AND TECHNICAL SKILLS.....41.79	71	
5.1 Mid-Level Skills.....	53.83	39
5.1.1 Workforce with secondary education.....	81.76	11
5.1.2 Population with secondary education.....	72.87	17
5.1.3 Technicians and associate professionals.....	25.69	79
5.1.4 Labour productivity per employee.....	34.99	48
5.2 Employability.....	29.74	122
5.2.1 Ease of finding skilled employees.....	31.45	127
5.2.2 Relevance of education system to the economy.....	31.39	99
5.2.3 Skills matching with secondary education.....	18.99	126
5.2.4 Skills matching with tertiary education.....	37.14	112
6 GLOBAL KNOWLEDGE SKILLS.....29.64	56	
6.1 High-Level Skills.....	24.81	80
6.1.1 Workforce with tertiary education.....	29.80	64
6.1.2 Population with tertiary education.....	22.21	67
6.1.3 Professionals.....	40.00	40
6.1.4 Researchers.....	10.67	51
6.1.5 Senior officials and managers.....	10.00	97
6.1.6 Availability of scientists and engineers.....	36.19	101
6.2 Talent Impact.....	34.46	40
6.2.1 Innovation output.....	37.83	52
6.2.2 High-value exports.....	27.59	44
6.2.3 New product entrepreneurial activity.....	59.44	24
6.2.4 New business density.....	26.97	24
6.2.5 Scientific journal articles.....	20.47	40

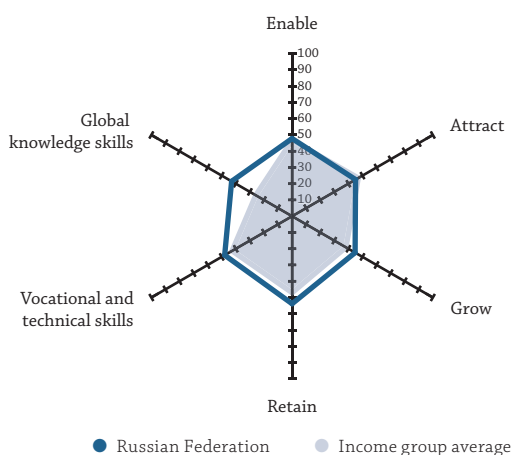
RUSSIAN FEDERATION

Key Indicators

Rank (out of 132)	48
Income group	Upper-middle income
Regional group	Europe
Population (millions)	144.48

GDP per capita (PPP US\$)	27,147.33
GDP (US\$ billions)	1,657.55
GTCI score	47.07
GTCI score (income group average)	41.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE	47.81	65
1.1 Regulatory Landscape	36.87	103
1.1.1 Government effectiveness	44.66	77
1.1.2 Rule of law	34.13	112
1.1.3 Political stability	50.22	103
1.1.4 Regulatory quality	36.42	104
1.1.5 Corruption	18.92	112
1.2 Market Landscape	59.32	40
1.2.1 Competition intensity	72.65	50
1.2.2 Ease of doing business	83.53	29
1.2.3 Cluster development	34.60	90
1.2.4 R&D expenditure	23.96	33
1.2.5 ICT infrastructure	70.61	43
1.2.6 Urban population	70.60	45
1.3 Business and Labour Landscape	47.22	65
Labour Market		
1.3.1 Tertiary-educated unemployment	84.29	50
1.3.2 Active labour market policies	51.27	53
1.3.3 Labour-employer cooperation	34.95	79
Management Practice		
1.3.4 Professional management	40.09	92
1.3.5 Relationship of pay to productivity	63.88	35
Technology Adoption		
1.3.6 Technology utilisation	52.97	62
1.3.7 Investment in emerging technologies	48.90	46
1.3.8 Robot density	1.42	48
2 ATTRACT	45.11	86
2.1 External Openness	37.17	87
Attract Business		
2.1.1 FDI and technology transfer	44.38	101
2.1.2 Prevalence of foreign ownership	31.40	121
Attract People		
2.1.3 Migrant stock	52.24	47
2.1.4 International students	14.39	49
2.1.5 Brain gain	43.43	66
2.2 Internal Openness	53.04	85
Social Inclusion		
2.2.1 Tolerance of minorities	15.56	117
2.2.2 Tolerance of immigrants	41.10	98
2.2.3 Social mobility	51.73	81
Gender Equality		
2.2.4 Female graduates	n/a	n/a
2.2.5 Gender development gap	95.83	5
2.2.6 Leadership opportunities for women	61.00	39

	Score	Rank
3 GROW	44.77	43
3.1 Formal Education	45.33	27
Enrolment		
3.1.1 Vocational enrolment	24.46	48
3.1.2 Tertiary enrolment	64.52	16
Quality		
3.1.3 Tertiary education expenditure	17.62	74
3.1.4 Reading, maths, and science	71.85	25
3.1.5 University ranking	48.21	20
3.2 Lifelong Learning	46.02	60
3.2.1 Quality of management schools	41.59	84
3.2.2 Prevalence of training in firms	56.46	25
3.2.3 Employee development	40.02	63
3.3 Access to Growth Opportunities	42.96	86
Empowerment		
3.3.1 Delegation of authority	44.64	69
3.3.2 Personal rights	40.08	109
Collaboration		
3.3.3 Use of virtual social networks	61.57	97
3.3.4 Use of virtual professional networks	5.22	80
3.3.5 Collaboration within organisations	58.47	38
3.3.6 Collaboration across organisations	47.77	42

4 RETAIN	53.84	57
4.1 Sustainability	47.77	51
4.1.1 Pension system	65.90	42
4.1.2 Social protection	33.15	87
4.1.3 Brain retention	44.26	53
4.2 Lifestyle	59.90	55
4.2.1 Environmental performance	60.61	47
4.2.2 Personal safety	27.64	114
4.2.3 Physician density	63.44	12
4.2.4 Sanitation	87.93	73

5 VOCATIONAL AND TECHNICAL SKILLS	47.90	51
5.1 Mid-Level Skills	45.02	59
5.1.1 Workforce with secondary education	60.00	38
5.1.2 Population with secondary education	30.05	73
5.1.3 Technicians and associate professionals	56.29	31
5.1.4 Labour productivity per employee	33.74	51
5.2 Employability	50.78	59
5.2.1 Ease of finding skilled employees	62.79	49
5.2.2 Relevance of education system to the economy	46.32	62
5.2.3 Skills matching with secondary education	45.94	56
5.2.4 Skills matching with tertiary education	48.08	83

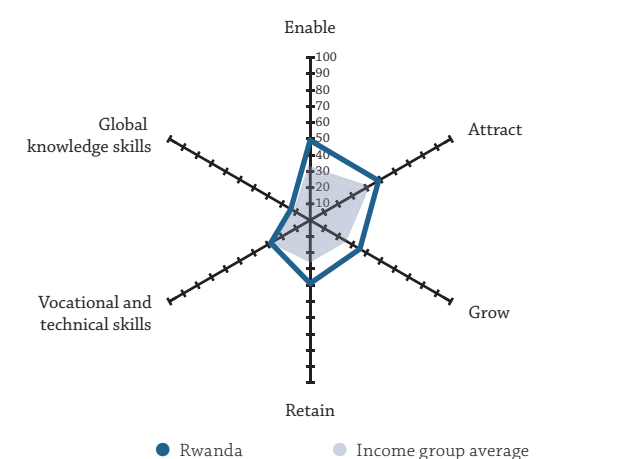
6 GLOBAL KNOWLEDGE SKILLS	42.97	31
6.1 High-Level Skills	62.78	12
6.1.1 Workforce with tertiary education	77.72	4
6.1.2 Population with tertiary education	100.00	1
6.1.3 Professionals	64.52	12
6.1.4 Researchers	34.48	31
6.1.5 Senior officials and managers	39.84	34
6.1.6 Availability of scientists and engineers	60.14	45
6.2 Talent Impact	23.16	64
6.2.1 Innovation output	34.50	58
6.2.2 High-value exports	34.31	33
6.2.3 New product entrepreneurial activity	9.90	86
6.2.4 New business density	20.88	28
6.2.5 Scientific journal articles	16.20	47

RWANDA

Key Indicators

Rank (out of 132).....	93
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	12.30

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....49.15	59	
1.1 Regulatory Landscape.....	56.57	51
1.1.1 Government effectiveness.....	52.86	53
1.1.2 Rule of law.....	55.67	55
1.1.3 Political stability.....	65.87	65
1.1.4 Regulatory quality.....	51.68	62
1.1.5 Corruption.....	56.76	41
1.2 Market Landscape.....	39.31	99
1.2.1 Competition intensity.....	51.77	111
1.2.2 Ease of doing business.....	84.44	27
1.2.3 Cluster development.....	42.93	66
1.2.4 R&D expenditure.....	n/a	n/a
1.2.5 ICT infrastructure.....	12.60	119
1.2.6 Urban population.....	4.81	130
1.3 Business and Labour Landscape.....	51.58	49
Labour Market		
1.3.1 Tertiary-educated unemployment.....	35.45	121
1.3.2 Active labour market policies.....	48.34	59
1.3.3 Labour-employer cooperation.....	58.34	30
Management Practice		
1.3.4 Professional management.....	62.58	38
1.3.5 Relationship of pay to productivity.....	53.40	56
Technology Adoption		
1.3.6 Technology utilisation.....	52.91	61
1.3.7 Investment in emerging technologies.....	50.02	43
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....48.65	66	
2.1 External Openness.....	45.23	58
Attract Business		
2.1.1 FDI and technology transfer.....	54.15	74
2.1.2 Prevalence of foreign ownership.....	50.76	92
Attract People		
2.1.3 Migrant stock.....	41.01	64
2.1.4 International students.....	6.26	73
2.1.5 Brain gain.....	73.95	17
2.2 Internal Openness.....	52.08	91
Social Inclusion		
2.2.1 Tolerance of minorities.....	2.22	129
2.2.2 Tolerance of immigrants.....	49.32	83
2.2.3 Social mobility.....	69.29	33
Gender Equality		
2.2.4 Female graduates.....	49.85	94
2.2.5 Gender development gap.....	67.91	90
2.2.6 Leadership opportunities for women.....	73.87	20

GDP per capita (PPP US\$).....	2,253.52
GDP (US\$ billions).....	9.51
GTCI score.....	35.62
GTCI score (income group average).....	26.01

	Score	Rank
3 GROW.....35.36	77	
3.1 Formal Education.....	10.63	106
Enrolment		
3.1.1 Vocational enrolment.....	20.10	57
3.1.2 Tertiary enrolment.....	5.46	114
Quality		
3.1.3 Tertiary education expenditure.....	16.97	75
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	50.14	48
3.2.1 Quality of management schools.....	46.17	69
3.2.2 Prevalence of training in firms.....	68.60	13
3.2.3 Employee development.....	35.64	75
3.3 Access to Growth Opportunities.....	45.32	72
Empowerment		
3.3.1 Delegation of authority.....	54.65	41
3.3.2 Personal rights.....	51.52	99
Collaboration		
3.3.3 Use of virtual social networks.....	52.98	111
3.3.4 Use of virtual professional networks.....	0.96	113
3.3.5 Collaboration within organisations.....	59.52	36
3.3.6 Collaboration across organisations.....	52.27	32

4 RETAIN.....38.91	91	
4.1 Sustainability.....	45.96	55
4.1.1 Pension system.....	4.30	107
4.1.2 Social protection.....	61.55	35
4.1.3 Brain retention.....	72.03	20
4.2 Lifestyle.....	31.85	105
4.2.1 Environmental performance.....	27.09	113
4.2.2 Personal safety.....	40.12	94
4.2.3 Physician density.....	0.72	121
4.2.4 Sanitation.....	59.48	99

5 VOCATIONAL AND TECHNICAL SKILLS.....27.96	112	
5.1 Mid-Level Skills.....	7.93	122
5.1.1 Workforce with secondary education.....	12.60	113
5.1.2 Population with secondary education.....	5.71	108
5.1.3 Technicians and associate professionals.....	5.48	120
5.1.4 Labour productivity per employee.....	n/a	n/a
5.2 Employability.....	47.99	69
5.2.1 Ease of finding skilled employees.....	57.63	60
5.2.2 Relevance of education system to the economy.....	50.26	56
5.2.3 Skills matching with secondary education.....	34.44	87
5.2.4 Skills matching with tertiary education.....	49.62	78

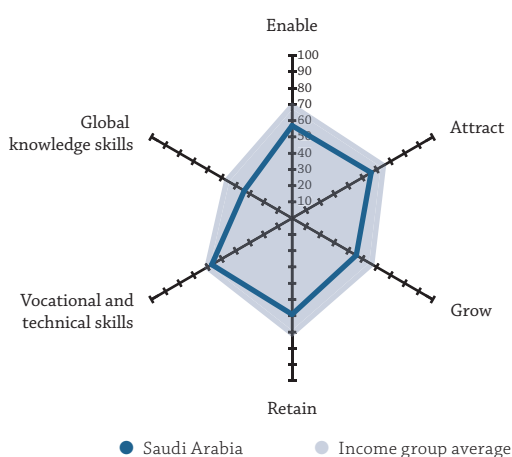
6 GLOBAL KNOWLEDGE SKILLS.....13.68	107	
6.1 High-Level Skills.....	13.65	115
6.1.1 Workforce with tertiary education.....	11.53	102
6.1.2 Population with tertiary education.....	3.67	100
6.1.3 Professionals.....	13.34	103
6.1.4 Researchers.....	0.02	109
6.1.5 Senior officials and managers.....	6.88	103
6.1.6 Availability of scientists and engineers.....	46.43	69
6.2 Talent Impact.....	13.71	92
6.2.1 Innovation output.....	8.58	120
6.2.2 High-value exports.....	36.57	32
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	9.33	50
6.2.5 Scientific journal articles.....	0.35	115

SAUDI ARABIA

Key Indicators

Rank (out of 132).....	40
Income group.....	High income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	33.70

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	56.97	44
1.1 Regulatory Landscape.....	50.85	61
1.1.1 Government effectiveness.....	52.54	55
1.1.2 Rule of law.....	54.98	57
1.1.3 Political stability.....	51.39	99
1.1.4 Regulatory quality.....	48.07	70
1.1.5 Corruption.....	47.30	49
1.2 Market Landscape.....	62.89	33
1.2.1 Competition intensity.....	79.19	27
1.2.2 Ease of doing business.....	58.75	83
1.2.3 Cluster development.....	70.04	20
1.2.4 R&D expenditure.....	17.55	43
1.2.5 ICT infrastructure.....	70.36	45
1.2.6 Urban population.....	81.42	25
1.3 Business and Labour Landscape.....	57.17	39
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	64.88	94
1.3.2 Active labour market policies.....	74.72	23
1.3.3 Labour-employer cooperation.....	52.25	38
1.3.4 Management Practice		
1.3.4.1 Professional management.....	58.62	41
1.3.5 Relationship of pay to productivity.....	69.01	23
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	75.86	26
1.3.7 Investment in emerging technologies.....	61.52	29
1.3.8 Robot density.....	0.47	58
2 ATTRACT.....	56.14	41
2.1 External Openness.....	57.67	27
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	71.49	35
2.1.2 Prevalence of foreign ownership.....	45.56	100
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	84.36	8
2.1.4 International students.....	18.00	39
2.1.5 Brain gain.....	68.96	19
2.2 Internal Openness.....	54.61	71
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	17.78	110
2.2.2 Tolerance of immigrants.....	83.56	20
2.2.3 Social mobility.....	77.23	24
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	62.96	79
2.2.5 Gender development gap.....	45.13	114
2.2.6 Leadership opportunities for women.....	40.98	80

GDP per capita (PPP US\$).....	55,119.91
GDP (US\$ billions).....	782.48
GTCI score.....	51.48
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	45.61	41
3.1 Formal Education.....	34.87	46
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	8.29	88
3.1.2 Tertiary enrolment.....	54.27	28
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	42.06	30
3.2 Lifelong Learning.....	54.96	37
3.2.1 Quality of management schools.....	59.52	40
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	50.40	43
3.3 Access to Growth Opportunities.....	46.99	65
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	58.98	36
3.3.2 Personal rights.....	2.23	130
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	91.28	11
3.3.4 Use of virtual professional networks.....	13.46	50
3.3.5 Collaboration within organisations.....	56.50	41
3.3.6 Collaboration across organisations.....	59.51	27

4 RETAIN.....	59.15	42
4.1 Sustainability.....	62.53	32
4.1.1 Pension system.....	50.10	55
4.1.2 Social protection.....	68.94	29
4.1.3 Brain retention.....	68.55	24
4.2 Lifestyle.....	55.76	64
4.2.1 Environmental performance.....	50.08	74
4.2.2 Personal safety.....	32.10	104
4.2.3 Physician density.....	40.88	46
4.2.4 Sanitation.....	100.00	1

5 VOCATIONAL AND TECHNICAL SKILLS.....	57.08	32
5.1 Mid-Level Skills.....	54.28	37
5.1.1 Workforce with secondary education.....	44.53	67
5.1.2 Population with secondary education.....	38.62	63
5.1.3 Technicians and associate professionals.....	52.94	39
5.1.4 Labour productivity per employee.....	81.05	6
5.2 Employability.....	59.87	40
5.2.1 Ease of finding skilled employees.....	66.33	42
5.2.2 Relevance of education system to the economy.....	62.09	33
5.2.3 Skills matching with secondary education.....	47.80	51
5.2.4 Skills matching with tertiary education.....	63.26	41

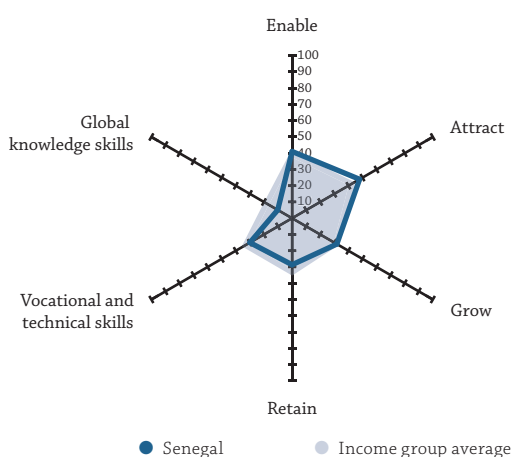
6 GLOBAL KNOWLEDGE SKILLS.....	33.97	49
6.1 High-Level Skills.....	50.16	27
6.1.1 Workforce with tertiary education.....	40.60	45
6.1.2 Population with tertiary education.....	32.69	48
6.1.3 Professionals.....	6.29	117
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	100.00	1
6.1.6 Availability of scientists and engineers.....	71.23	22
6.2 Talent Impact.....	17.77	78
6.2.1 Innovation output.....	22.94	83
6.2.2 High-value exports.....	8.40	89
6.2.3 New product entrepreneurial activity.....	44.20	49
6.2.4 New business density.....	2.07	87
6.2.5 Scientific journal articles.....	11.24	51

SENEGAL

Key Indicators

Rank (out of 132).....	104
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	15.85

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....41.08 92		
1.1 Regulatory Landscape.....47.67 72		
1.1.1 Government effectiveness.....38.79 90		
1.1.2 Rule of law.....49.19 69		
1.1.3 Political stability.....64.03 69		
1.1.4 Regulatory quality.....44.47 79		
1.1.5 Corruption.....41.89 55		
1.2 Market Landscape.....37.00 102		
1.2.1 Competition intensity.....67.81 67		
1.2.2 Ease of doing business.....42.05 113		
1.2.3 Cluster development.....32.64 94		
1.2.4 R&D expenditure.....16.16 47		
1.2.5 ICT infrastructure.....24.05 109		
1.2.6 Urban population.....39.28 100		
1.3 Business and Labour Landscape.....38.58 90		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....41.12 116		
1.3.2 Active labour market policies.....22.63 107		
1.3.3 Labour-employer cooperation.....33.39 85		
1.3.4 Management Practice		
1.3.4 Professional management.....33.20 101		
1.3.5 Relationship of pay to productivity.....33.46 109		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....65.02 43		
1.3.7 Investment in emerging technologies.....41.21 58		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....47.94 70		
2.1 External Openness.....45.24 57		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....55.23 71		
2.1.2 Prevalence of foreign ownership.....66.63 47		
2.1.3 Attract People		
2.1.3 Migrant stock.....28.26 87		
2.1.4 International students.....30.50 22		
2.1.5 Brain gain.....45.59 61		
2.2 Internal Openness.....50.63 95		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....46.67 63		
2.2.2 Tolerance of immigrants.....75.34 30		
2.2.3 Social mobility.....57.51 63		
2.2.4 Gender Equality		
2.2.4 Female graduates.....21.99 108		
2.2.5 Gender development gap.....57.30 107		
2.2.6 Leadership opportunities for women.....45.00 67		

GDP per capita (PPP US\$).....	3,775.87
GDP (US\$ billions).....	24.13
GTCI score.....	31.60
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....31.79 90		
3.1 Formal Education.....14.47 93		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....4.78 97		
3.1.2 Tertiary enrolment.....8.32 104		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....44.79 10		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....36.13 90		
3.2.1 Quality of management schools.....61.30 37		
3.2.2 Prevalence of training in firms.....18.47 85		
3.2.3 Employee development.....28.61 99		
3.3 Access to Growth Opportunities.....44.77 79		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....25.95 116		
3.3.2 Personal rights.....79.76 55		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....74.73 62		
3.3.4 Use of virtual professional networks.....2.86 94		
3.3.5 Collaboration within organisations.....52.06 50		
3.3.6 Collaboration across organisations.....33.24 83		

4 RETAIN.....28.62 109		
4.1 Sustainability.....21.26 116		
4.1.1 Pension system.....2.76 113		
4.1.2 Social protection.....27.29 105		
4.1.3 Brain retention.....33.73 85		
4.2 Lifestyle.....35.98 99		
4.2.1 Environmental performance.....36.82 100		
4.2.2 Personal safety.....61.90 49		
4.2.3 Physician density.....0.79 120		
4.2.4 Sanitation.....44.42 108		

5 VOCATIONAL AND TECHNICAL SKILLS.....29.97 107		
5.1 Mid-Level Skills.....7.07 124		
5.1.1 Workforce with secondary education.....7.25 118		
5.1.2 Population with secondary education.....8.42 106		
5.1.3 Technicians and associate professionals.....5.56 119		
5.1.4 Labour productivity per employee.....7.03 91		
5.2 Employability.....52.87 54		
5.2.1 Ease of finding skilled employees.....68.98 35		
5.2.2 Relevance of education system to the economy.....44.33 66		
5.2.3 Skills matching with secondary education.....41.91 70		
5.2.4 Skills matching with tertiary education.....56.28 61		

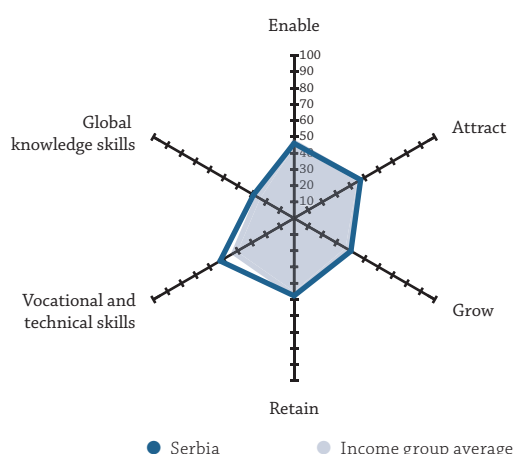
6 GLOBAL KNOWLEDGE SKILLS.....10.21 119		
6.1 High-Level Skills.....12.37 117		
6.1.1 Workforce with tertiary education.....7.63 111		
6.1.2 Population with tertiary education.....4.83 98		
6.1.3 Professionals.....9.83 110		
6.1.4 Researchers.....6.54 65		
6.1.5 Senior officials and managers.....3.45 118		
6.1.6 Availability of scientists and engineers.....41.94 84		
6.2 Talent Impact.....8.06 112		
6.2.1 Innovation output.....23.99 79		
6.2.2 High-value exports.....3.27 109		
6.2.3 New product entrepreneurial activity.....10.17 85		
6.2.4 New business density.....1.96 89		
6.2.5 Scientific journal articles.....0.89 96		

SERBIA

Key Indicators

Rank (out of 132).....	58
Income group.....	Upper-middle income
Regional group.....	Europe
Population (millions).....	6.98

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	46.05	78
1.1 Regulatory Landscape.....	49.74	62
1.1.1 Government effectiveness.....	51.18	59
1.1.2 Rule of law.....	48.17	73
1.1.3 Political stability.....	67.26	62
1.1.4 Regulatory quality.....	48.31	69
1.1.5 Corruption.....	33.78	71
1.2 Market Landscape.....	52.48	63
1.2.1 Competition intensity.....	61.30	83
1.2.2 Ease of doing business.....	76.60	44
1.2.3 Cluster development.....	37.14	81
1.2.4 R&D expenditure.....	20.07	38
1.2.5 ICT infrastructure.....	70.23	46
1.2.6 Urban population.....	49.51	84
1.3 Business and Labour Landscape.....	35.92	102
Labour Market		
1.3.1 Tertiary-educated unemployment.....	64.32	96
1.3.2 Active labour market policies.....	41.37	66
1.3.3 Labour-employer cooperation.....	28.21	95
Management Practice		
1.3.4 Professional management.....	28.11	118
1.3.5 Relationship of pay to productivity.....	53.28	57
Technology Adoption		
1.3.6 Technology utilisation.....	39.74	98
1.3.7 Investment in emerging technologies.....	31.34	92
1.3.8 Robot density.....	0.99	52
2 ATTRACT.....	47.26	74
2.1 External Openness.....	40.59	76
Attract Business		
2.1.1 FDI and technology transfer.....	50.95	85
2.1.2 Prevalence of foreign ownership.....	59.44	62
Attract People		
2.1.3 Migrant stock.....	56.65	39
2.1.4 International students.....	16.20	43
2.1.5 Brain gain.....	19.70	119
2.2 Internal Openness.....	53.92	80
Social Inclusion		
2.2.1 Tolerance of minorities.....	25.56	99
2.2.2 Tolerance of immigrants.....	58.90	65
2.2.3 Social mobility.....	40.77	118
Gender Equality		
2.2.4 Female graduates.....	76.41	51
2.2.5 Gender development gap.....	80.44	51
2.2.6 Leadership opportunities for women.....	41.46	78

GDP per capita (PPP US\$).....	16,433.38
GDP (US\$ billions).....	50.51
GTGI score.....	43.80
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW.....	40.39	57
3.1 Formal Education.....	35.86	41
Enrolment		
3.1.1 Vocational enrolment.....	53.83	13
3.1.2 Tertiary enrolment.....	52.32	34
Quality		
3.1.3 Tertiary education expenditure.....	25.59	48
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	11.71	66
3.2 Lifelong Learning.....	40.92	73
3.2.1 Quality of management schools.....	45.79	70
3.2.2 Prevalence of training in firms.....	45.38	34
3.2.3 Employee development.....	31.60	88
3.3 Access to Growth Opportunities.....	44.38	81
Empowerment		
3.3.1 Delegation of authority.....	37.32	91
3.3.2 Personal rights.....	66.72	81
Collaboration		
3.3.3 Use of virtual social networks.....	73.51	67
3.3.4 Use of virtual professional networks.....	8.14	68
3.3.5 Collaboration within organisations.....	45.29	73
3.3.6 Collaboration across organisations.....	35.31	77

4 RETAIN.....	47.73	65
4.1 Sustainability.....	35.05	84
4.1.1 Pension system.....	61.10	45
4.1.2 Social protection.....	30.47	96
4.1.3 Brain retention.....	13.57	125
4.2 Lifestyle.....	60.42	52
4.2.1 Environmental performance.....	50.11	72
4.2.2 Personal safety.....	58.13	59
4.2.3 Physician density.....	39.19	50
4.2.4 Sanitation.....	94.23	58

5 VOCATIONAL AND TECHNICAL SKILLS.....	52.55	42
5.1 Mid-Level Skills.....	54.69	35
5.1.1 Workforce with secondary education.....	77.60	16
5.1.2 Population with secondary education.....	71.30	21
5.1.3 Technicians and associate professionals.....	50.60	41
5.1.4 Labour productivity per employee.....	19.26	70
5.2 Employability.....	50.42	61
5.2.1 Ease of finding skilled employees.....	55.06	66
5.2.2 Relevance of education system to the economy.....	39.42	81
5.2.3 Skills matching with secondary education.....	53.27	42
5.2.4 Skills matching with tertiary education.....	53.92	70

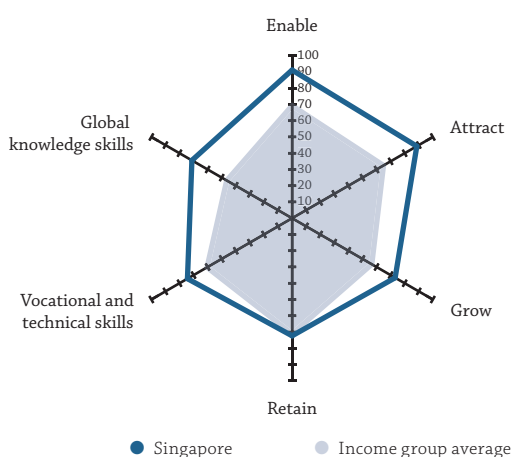
6 GLOBAL KNOWLEDGE SKILLS.....	28.83	58
6.1 High-Level Skills.....	33.43	56
6.1.1 Workforce with tertiary education.....	38.38	49
6.1.2 Population with tertiary education.....	32.21	50
6.1.3 Professionals.....	36.10	48
6.1.4 Researchers.....	25.11	38
6.1.5 Senior officials and managers.....	16.31	77
6.1.6 Availability of scientists and engineers.....	52.50	58
6.2 Talent Impact.....	24.23	59
6.2.1 Innovation output.....	35.90	56
6.2.2 High-value exports.....	n/a	n/a
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	8.44	52
6.2.5 Scientific journal articles.....	28.34	35

SINGAPORE

Key Indicators

Rank (out of 132).....	3
Income group.....	High income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	5.64

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....91.17	1	
1.1 Regulatory Landscape.....98.20	1	
1.1.1 Government effectiveness.....100.00	1	
1.1.2 Rule of law.....95.23	8	
1.1.3 Political stability.....99.83	2	
1.1.4 Regulatory quality.....100.00	1	
1.1.5 Corruption.....95.95	3	
1.2 Market Landscape.....83.46	4	
1.2.1 Competition intensity.....85.28	13	
1.2.2 Ease of doing business.....97.59	2	
1.2.3 Cluster development.....81.27	10	
1.2.4 R&D expenditure.....48.45	12	
1.2.5 ICT infrastructure.....88.17	11	
1.2.6 Urban population.....100.00	1	
1.3 Business and Labour Landscape.....91.84	1	
Labour Market		
1.3.1 Tertiary-educated unemployment.....86.51	44	
1.3.2 Active labour market policies.....96.73	4	
1.3.3 Labour-employer cooperation.....98.83	2	
Management Practice		
1.3.4 Professional management.....97.40	3	
1.3.5 Relationship of pay to productivity.....91.59	3	
Technology Adoption		
1.3.6 Technology utilisation.....85.04	12	
1.3.7 Investment in emerging technologies.....78.60	13	
1.3.8 Robot density.....100.00	1	
2 ATTRACT.....88.61	1	
2.1 External Openness.....94.74	1	
Attract Business		
2.1.1 FDI and technology transfer.....95.97	2	
2.1.2 Prevalence of foreign ownership.....95.97	3	
Attract People		
2.1.3 Migrant stock.....87.30	7	
2.1.4 International students.....100.00	1	
2.1.5 Brain gain.....94.47	3	
2.2 Internal Openness.....82.48	7	
Social Inclusion		
2.2.1 Tolerance of minorities.....88.89	6	
2.2.2 Tolerance of immigrants.....79.45	25	
2.2.3 Social mobility.....95.08	3	
Gender Equality		
2.2.4 Female graduates.....60.59	81	
2.2.5 Gender development gap.....82.49	45	
2.2.6 Leadership opportunities for women.....88.39	6	

GDP per capita (PPP US\$).....	101,352.58
GDP (US\$ billions).....	364.16
GTCI score.....	78.48
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....73.22	8	
3.1 Formal Education.....55.43	12	
Enrolment		
3.1.1 Vocational enrolment.....17.84	61	
3.1.2 Tertiary enrolment.....66.21	12	
Quality		
3.1.3 Tertiary education expenditure.....22.63	55	
3.1.4 Reading, maths, and science.....100.00	1	
3.1.5 University ranking.....70.49	11	
3.2 Lifelong Learning.....87.35	3	
3.2.1 Quality of management schools.....90.48	2	
3.2.2 Prevalence of training in firms.....n/a	n/a	
3.2.3 Employee development.....84.23	6	
3.3 Access to Growth Opportunities.....76.89	10	
Empowerment		
3.3.1 Delegation of authority.....79.35	18	
3.3.2 Personal rights.....66.13	82	
Collaboration		
3.3.3 Use of virtual social networks.....95.69	7	
3.3.4 Use of virtual professional networks.....76.35	3	
3.3.5 Collaboration within organisations.....77.59	18	
3.3.6 Collaboration across organisations.....66.20	16	

4 RETAIN.....72.34	24	
4.1 Sustainability.....70.29	24	
4.1.1 Pension system.....61.67	44	
4.1.2 Social protection.....59.91	37	
4.1.3 Brain retention.....89.29	4	
4.2 Lifestyle.....74.38	28	
4.2.1 Environmental performance.....61.34	44	
4.2.2 Personal safety.....100.00	1	
4.2.3 Physician density.....36.19	55	
4.2.4 Sanitation.....100.00	1	

5 VOCATIONAL AND TECHNICAL SKILLS.....74.34	5	
5.1 Mid-Level Skills.....63.58	16	
5.1.1 Workforce with secondary education.....36.85	77	
5.1.2 Population with secondary education.....37.09	66	
5.1.3 Technicians and associate professionals.....90.75	4	
5.1.4 Labour productivity per employee.....89.64	2	
5.2 Employability.....85.11	4	
5.2.1 Ease of finding skilled employees.....82.18	10	
5.2.2 Relevance of education system to the economy.....91.96	3	
5.2.3 Skills matching with secondary education.....77.93	8	
5.2.4 Skills matching with tertiary education.....88.37	4	

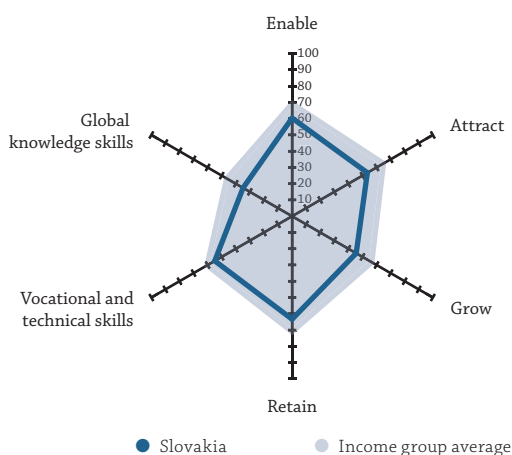
6 GLOBAL KNOWLEDGE SKILLS.....71.19	1	
6.1 High-Level Skills.....77.21	1	
6.1.1 Workforce with tertiary education.....82.70	2	
6.1.2 Population with tertiary education.....70.28	6	
6.1.3 Professionals.....52.42	19	
6.1.4 Researchers.....81.54	5	
6.1.5 Senior officials and managers.....95.68	3	
6.1.6 Availability of scientists and engineers.....80.63	10	
6.2 Talent Impact.....65.17	2	
6.2.1 Innovation output.....66.90	15	
6.2.2 High-value exports.....100.00	1	
6.2.3 New product entrepreneurial activity.....37.89	57	
6.2.4 New business density.....41.51	15	
6.2.5 Scientific journal articles.....79.53	6	

SLOVAKIA

Key Indicators

Rank (out of 132).....	39
Income group.....	High income
Regional group.....	Europe
Population (millions).....	5.45

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	60.38	36
1.1 Regulatory Landscape.....	66.69	39
1.1.1 Government effectiveness.....	66.11	37
1.1.2 Rule of law.....	66.00	39
1.1.3 Political stability.....	84.37	25
1.1.4 Regulatory quality.....	68.31	36
1.1.5 Corruption.....	48.65	48
1.2 Market Landscape.....	56.15	51
1.2.1 Competition intensity.....	77.48	34
1.2.2 Ease of doing business.....	79.60	39
1.2.3 Cluster development.....	43.53	61
1.2.4 R&D expenditure.....	19.00	40
1.2.5 ICT infrastructure.....	70.48	44
1.2.6 Urban population.....	46.79	91
1.3 Business and Labour Landscape.....	58.30	35
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	89.97	25
1.3.2 Active labour market policies.....	58.26	42
1.3.3 Labour-employer cooperation.....	37.96	68
1.3.4 Management Practice		
1.3.4 Professional management.....	56.64	47
1.3.5 Relationship of pay to productivity.....	59.40	46
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	65.97	38
1.3.7 Investment in emerging technologies.....	49.41	43
1.3.8 Robot density.....	48.76	15
2 ATTRACT.....	53.47	51
2.1 External Openness.....	50.29	39
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	80.97	17
2.1.2 Prevalence of foreign ownership.....	96.33	2
2.1.3 Attract People		
2.1.3 Migrant stock.....	34.68	73
2.1.4 International students.....	22.04	34
2.1.5 Brain gain.....	17.42	122
2.2 Internal Openness.....	56.66	61
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	41.11	76
2.2.2 Tolerance of immigrants.....	24.66	113
2.2.3 Social mobility.....	59.79	54
2.2.4 Gender Equality		
2.2.4 Female graduates.....	86.97	19
2.2.5 Gender development gap.....	85.54	29
2.2.6 Leadership opportunities for women.....	41.88	77

GDP per capita (PPP US\$).....	34,329.30
GDP (US\$ billions).....	106.47
GTCI score.....	52.08
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....	45.55	42
3.1 Formal Education.....	38.19	39
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	48.77	18
3.1.2 Tertiary enrolment.....	37.43	60
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	32.67	26
3.1.4 Reading, maths, and science.....	58.24	38
3.1.5 University ranking.....	13.81	62
3.2 Lifelong Learning.....	46.28	58
3.2.1 Quality of management schools.....	37.55	94
3.2.2 Prevalence of training in firms.....	52.90	26
3.2.3 Employee development.....	48.40	50
3.3 Access to Growth Opportunities.....	52.17	45
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	50.53	58
3.3.2 Personal rights.....	87.13	41
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	75.03	61
3.3.4 Use of virtual professional networks.....	9.04	65
3.3.5 Collaboration within organisations.....	45.80	71
3.3.6 Collaboration across organisations.....	45.48	47

4 RETAIN.....	63.35	33
4.1 Sustainability.....	49.95	47
4.1.1 Pension system.....	84.39	24
4.1.2 Social protection.....	48.48	51
4.1.3 Brain retention.....	16.98	120
4.2 Lifestyle.....	76.75	22
4.2.1 Environmental performance.....	71.96	27
4.2.2 Personal safety.....	81.17	22
4.2.3 Physician density.....	55.02	23
4.2.4 Sanitation.....	98.85	33

5 VOCATIONAL AND TECHNICAL SKILLS.....	54.92	39
5.1 Mid-Level Skills.....	75.81	3
5.1.1 Workforce with secondary education.....	93.14	4
5.1.2 Population with secondary education.....	95.31	3
5.1.3 Technicians and associate professionals.....	68.37	18
5.1.4 Labour productivity per employee.....	46.43	30
5.2 Employability.....	34.03	112
5.2.1 Ease of finding skilled employees.....	32.30	125
5.2.2 Relevance of education system to the economy.....	24.80	112
5.2.3 Skills matching with secondary education.....	40.62	73
5.2.4 Skills matching with tertiary education.....	38.41	110

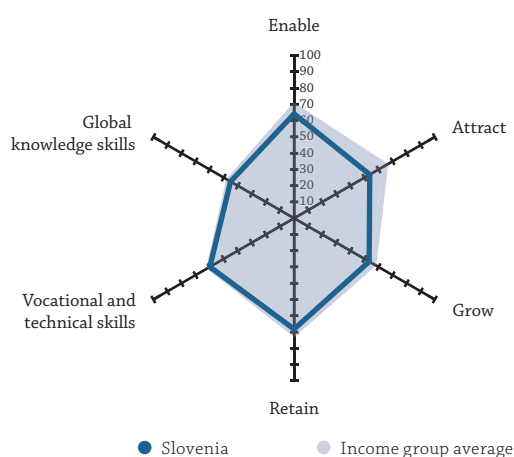
6 GLOBAL KNOWLEDGE SKILLS.....	34.84	44
6.1 High-Level Skills.....	32.34	59
6.1.1 Workforce with tertiary education.....	37.49	51
6.1.2 Population with tertiary education.....	29.12	59
6.1.3 Professionals.....	32.43	52
6.1.4 Researchers.....	33.79	32
6.1.5 Senior officials and managers.....	25.92	59
6.1.6 Availability of scientists and engineers.....	35.29	105
6.2 Talent Impact.....	37.33	34
6.2.1 Innovation output.....	51.14	32
6.2.2 High-value exports.....	32.55	38
6.2.3 New product entrepreneurial activity.....	41.26	53
6.2.4 New business density.....	22.62	27
6.2.5 Scientific journal articles.....	39.09	29

SLOVENIA

Key Indicators

Rank (out of 132).....	31
Income group	High income
Regional group	Europe
Population (millions)	2.07

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	64.21	30
1.1 Regulatory Landscape.....	72.12	29
1.1.1 Government effectiveness.....	74.92	24
1.1.2 Rule of law.....	76.56	26
1.1.3 Political stability.....	84.66	24
1.1.4 Regulatory quality.....	62.28	43
1.1.5 Corruption.....	62.16	31
1.2 Market Landscape.....	61.43	36
1.2.1 Competition intensity.....	76.23	37
1.2.2 Ease of doing business.....	80.39	37
1.2.3 Cluster development.....	44.72	55
1.2.4 R&D expenditure.....	40.26	19
1.2.5 ICT infrastructure.....	79.26	27
1.2.6 Urban population.....	47.73	89
1.3 Business and Labour Landscape.....	59.08	32
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	88.15	35
1.3.2 Active labour market policies.....	71.47	25
1.3.3 Labour-employer cooperation.....	42.78	53
1.3.4 Management Practice		
1.3.4.1 Professional management.....	51.20	62
1.3.5 Relationship of pay to productivity.....	50.37	60
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	65.55	40
1.3.7 Investment in emerging technologies.....	51.61	40
1.3.8 Robot density.....	51.53	12
2 ATTRACT.....	53.74	49
2.1 External Openness.....	41.55	71
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	58.80	61
2.1.2 Prevalence of foreign ownership.....	47.66	97
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	59.48	33
2.1.4 International students.....	12.07	56
2.1.5 Brain gain.....	29.71	101
2.2 Internal Openness.....	65.94	36
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	64.44	35
2.2.2 Tolerance of immigrants.....	32.88	106
2.2.3 Social mobility.....	68.77	35
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	79.05	38
2.2.5 Gender development gap.....	89.81	16
2.2.6 Leadership opportunities for women.....	60.67	40

GDP per capita (PPP US\$)	38,674.35
GDP (US\$ billions)	54.24
GTGI score.....	57.42
GTGI score (income group average)	61.46

	Score	Rank
3 GROW.....	53.35	31
3.1 Formal Education.....	50.14	19
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	69.66	5
3.1.2 Tertiary enrolment.....	61.18	19
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	21.97	60
3.1.4 Reading, maths, and science.....	80.11	8
3.1.5 University ranking.....	17.77	54
3.2 Lifelong Learning.....	52.25	44
3.2.1 Quality of management schools.....	54.68	46
3.2.2 Prevalence of training in firms.....	50.26	30
3.2.3 Employee development.....	51.79	40
3.3 Access to Growth Opportunities.....	57.67	33
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	52.54	49
3.3.2 Personal rights.....	96.71	12
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	82.27	40
3.3.4 Use of virtual professional networks.....	16.62	39
3.3.5 Collaboration within organisations.....	57.38	40
3.3.6 Collaboration across organisations.....	40.51	60

4 RETAIN.....	68.25	27
4.1 Sustainability.....	61.91	33
4.1.1 Pension system.....	83.27	25
4.1.2 Social protection.....	69.63	27
4.1.3 Brain retention.....	32.83	89
4.2 Lifestyle.....	74.58	27
4.2.1 Environmental performance.....	66.91	33
4.2.2 Personal safety.....	87.47	11
4.2.3 Physician density.....	44.92	42
4.2.4 Sanitation.....	99.04	31

5 VOCATIONAL AND TECHNICAL SKILLS.....	59.84	27
5.1 Mid-Level Skills.....	63.08	19
5.1.1 Workforce with secondary education.....	75.46	20
5.1.2 Population with secondary education.....	77.32	12
5.1.3 Technicians and associate professionals.....	56.82	30
5.1.4 Labour productivity per employee.....	42.71	36
5.2 Employability.....	56.60	44
5.2.1 Ease of finding skilled employees.....	59.40	57
5.2.2 Relevance of education system to the economy.....	53.97	46
5.2.3 Skills matching with secondary education.....	58.52	32
5.2.4 Skills matching with tertiary education.....	54.52	66

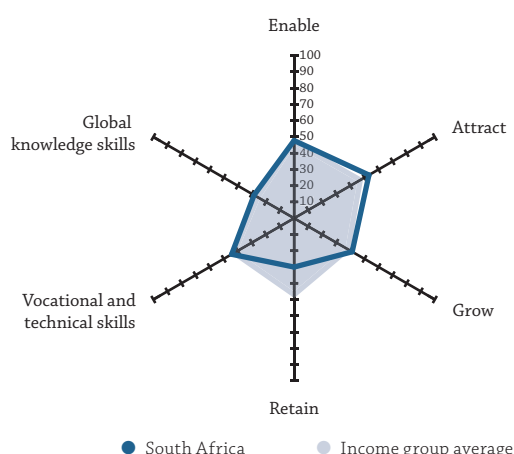
6 GLOBAL KNOWLEDGE SKILLS.....	45.14	27
6.1 High-Level Skills.....	50.06	29
6.1.1 Workforce with tertiary education.....	52.28	29
6.1.2 Population with tertiary education.....	42.50	33
6.1.3 Professionals.....	58.26	16
6.1.4 Researchers.....	54.09	17
6.1.5 Senior officials and managers.....	44.41	27
6.1.6 Availability of scientists and engineers.....	48.83	66
6.2 Talent Impact.....	40.22	31
6.2.1 Innovation output.....	52.54	29
6.2.2 High-value exports.....	18.82	62
6.2.3 New product entrepreneurial activity.....	49.36	42
6.2.4 New business density.....	15.04	39
6.2.5 Scientific journal articles.....	65.37	10

SOUTH AFRICA

Key Indicators

Rank (out of 132).....	70
Income group.....	Upper-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	57.78

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....47.81	64	
1.1 Regulatory Landscape.....	51.57	60
1.1.1 Government effectiveness.....	53.29	51
1.1.2 Rule of law.....	52.40	66
1.1.3 Political stability.....	59.15	81
1.1.4 Regulatory quality.....	53.81	58
1.1.5 Corruption.....	39.19	59
1.2 Market Landscape.....	54.01	56
1.2.1 Competition intensity.....	73.16	48
1.2.2 Ease of doing business.....	63.27	76
1.2.3 Cluster development.....	60.31	31
1.2.4 R&D expenditure.....	17.67	42
1.2.5 ICT infrastructure.....	48.35	74
1.2.6 Urban population.....	61.31	63
1.3 Business and Labour Landscape.....	37.85	93
Labour Market		
1.3.1 Tertiary-educated unemployment.....	60.31	101
1.3.2 Active labour market policies.....	26.28	103
1.3.3 Labour-employer cooperation.....	3.62	128
Management Practice		
1.3.4 Professional management.....	48.20	67
1.3.5 Relationship of pay to productivity.....	40.06	88
Technology Adoption		
1.3.6 Technology utilisation.....	65.15	42
1.3.7 Investment in emerging technologies.....	51.83	39
1.3.8 Robot density.....	7.36	35
2 ATTRACT.....53.17	52	
2.1 External Openness.....	47.47	53
Attract Business		
2.1.1 FDI and technology transfer.....	60.16	58
2.1.2 Prevalence of foreign ownership.....	66.35	48
Attract People		
2.1.3 Migrant stock.....	52.69	45
2.1.4 International students.....	15.65	45
2.1.5 Brain gain.....	42.51	71
2.2 Internal Openness.....	58.87	57
Social Inclusion		
2.2.1 Tolerance of minorities.....	43.33	69
2.2.2 Tolerance of immigrants.....	65.75	51
2.2.3 Social mobility.....	45.12	103
Gender Equality		
2.2.4 Female graduates.....	82.98	28
2.2.5 Gender development gap.....	83.05	43
2.2.6 Leadership opportunities for women.....	33.00	98

GDP per capita (PPP US\$).....	13,661.37
GDP (US\$ billions).....	366.30
GTCI score.....	40.85
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....41.27	54	
3.1 Formal Education.....	20.07	78
Enrolment		
3.1.1 Vocational enrolment.....	11.50	82
3.1.2 Tertiary enrolment.....	15.68	92
Quality		
3.1.3 Tertiary education expenditure.....	19.48	68
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	33.60	35
3.2 Lifelong Learning.....	46.51	57
3.2.1 Quality of management schools.....	45.34	74
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	47.68	51
3.3 Access to Growth Opportunities.....	57.24	35
Empowerment		
3.3.1 Delegation of authority.....	61.76	33
3.3.2 Personal rights.....	78.03	59
Collaboration		
3.3.3 Use of virtual social networks.....	80.03	50
3.3.4 Use of virtual professional networks.....	22.44	29
3.3.5 Collaboration within organisations.....	51.13	51
3.3.6 Collaboration across organisations.....	50.03	33

4 RETAIN.....30.04	106	
4.1 Sustainability.....	26.30	108
4.1.1 Pension system.....	6.30	100
4.1.2 Social protection.....	35.69	81
4.1.3 Brain retention.....	36.92	78
4.2 Lifestyle.....	33.78	102
4.2.1 Environmental performance.....	28.84	110
4.2.2 Personal safety.....	22.37	120
4.2.3 Physician density.....	12.81	89
4.2.4 Sanitation.....	71.08	93

5 VOCATIONAL AND TECHNICAL SKILLS.....44.35	63	
5.1 Mid-Level Skills.....	46.63	55
5.1.1 Workforce with secondary education.....	43.73	68
5.1.2 Population with secondary education.....	78.48	10
5.1.3 Technicians and associate professionals.....	37.77	59
5.1.4 Labour productivity per employee.....	26.52	58
5.2 Employability.....	42.07	87
5.2.1 Ease of finding skilled employees.....	52.80	74
5.2.2 Relevance of education system to the economy.....	28.72	106
5.2.3 Skills matching with secondary education.....	36.44	81
5.2.4 Skills matching with tertiary education.....	50.31	75

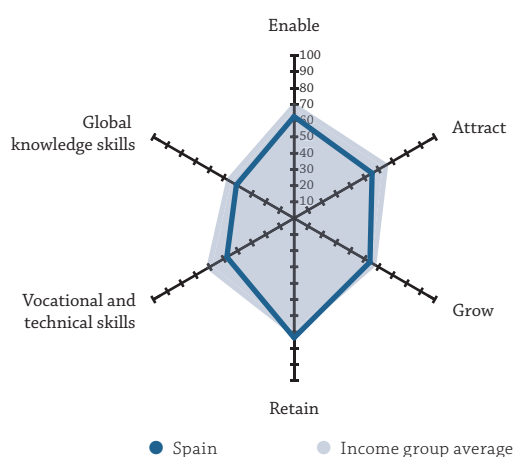
6 GLOBAL KNOWLEDGE SKILLS.....28.45	60	
6.1 High-Level Skills.....	25.32	77
6.1.1 Workforce with tertiary education.....	23.38	76
6.1.2 Population with tertiary education.....	11.05	92
6.1.3 Professionals.....	13.73	100
6.1.4 Researchers.....	5.86	68
6.1.5 Senior officials and managers.....	54.54	19
6.1.6 Availability of scientists and engineers.....	43.34	78
6.2 Talent Impact.....	31.58	47
6.2.1 Innovation output.....	27.85	67
6.2.2 High-value exports.....	13.82	78
6.2.3 New product entrepreneurial activity.....	58.67	26
6.2.4 New business density.....	49.20	11
6.2.5 Scientific journal articles.....	8.34	56

SPAIN

Key Indicators

Rank (out of 132).....	32
Income group	High income
Regional group	Europe
Population (millions)	46.72

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 62.58 32		
1.1 Regulatory Landscape..... 69.89 34		
1.1.1 Government effectiveness..... 71.61 28		
1.1.2 Rule of law..... 76.21 29		
1.1.3 Political stability..... 70.93 51		
1.1.4 Regulatory quality..... 71.23 33		
1.1.5 Corruption..... 59.46 36		
1.2 Market Landscape..... 67.61 25		
1.2.1 Competition intensity..... 80.93 20		
1.2.2 Ease of doing business..... 84.08 28		
1.2.3 Cluster development..... 56.96 35		
1.2.4 R&D expenditure..... 26.15 31		
1.2.5 ICT infrastructure..... 80.15 25		
1.2.6 Urban population..... 77.37 34		
1.3 Business and Labour Landscape..... 50.24 54		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... 70.65 92		
1.3.2 Active labour market policies..... 47.65 60		
1.3.3 Labour-employer cooperation..... 33.78 84		
1.3.4 Management Practice		
1.3.4 Professional management..... 58.17 42		
1.3.5 Relationship of pay to productivity..... 36.62 99		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 62.27 47		
1.3.7 Investment in emerging technologies..... 43.01 54		
1.3.8 Robot density..... 49.72 14		
2 ATTRACT..... 55.43 45		
2.1 External Openness..... 51.12 37		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 73.33 29		
2.1.2 Prevalence of foreign ownership..... 73.84 34		
2.1.3 Attract People		
2.1.3 Migrant stock..... 59.63 32		
2.1.4 International students..... 9.87 63		
2.1.5 Brain gain..... 38.93 83		
2.2 Internal Openness..... 59.75 55		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 43.33 69		
2.2.2 Tolerance of immigrants..... 87.67 12		
2.2.3 Social mobility..... 54.93 72		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 70.04 69		
2.2.5 Gender development gap..... 81.37 48		
2.2.6 Leadership opportunities for women..... 21.13 118		

GDP per capita (PPP US\$)	40,854.58
GDP (US\$ billions)	1,426.19
GTCI score.....	55.70
GTCI score (income group average)	61.46

	Score	Rank
3 GROW..... 53.91 29		
3.1 Formal Education..... 48.03 22		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... 28.49 43		
3.1.2 Tertiary enrolment..... 71.97 6		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... 21.46 61		
3.1.4 Reading, maths, and science..... 71.67 26		
3.1.5 University ranking..... 46.55 23		
3.2 Lifelong Learning..... 58.42 31		
3.2.1 Quality of management schools..... 79.79 10		
3.2.2 Prevalence of training in firms..... n/a n/a		
3.2.3 Employee development..... 37.04 67		
3.3 Access to Growth Opportunities..... 55.29 40		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 49.01 61		
3.3.2 Personal rights..... 96.10 18		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 81.49 42		
3.3.4 Use of virtual professional networks..... 37.29 17		
3.3.5 Collaboration within organisations..... 36.11 101		
3.3.6 Collaboration across organisations..... 31.73 87		

4 RETAIN..... 73.54 23		
4.1 Sustainability..... 65.97 29		
4.1.1 Pension system..... 74.98 32		
4.1.2 Social protection..... 84.78 15		
4.1.3 Brain retention..... 38.14 74		
4.2 Lifestyle..... 81.12 12		
4.2.1 Environmental performance..... 84.95 12		
4.2.2 Personal safety..... 77.86 23		
4.2.3 Physician density..... 61.79 15		
4.2.4 Sanitation..... 99.90 14		

5 VOCATIONAL AND TECHNICAL SKILLS..... 47.77 53		
5.1 Mid-Level Skills..... 39.98 65		
5.1.1 Workforce with secondary education..... 31.67 85		
5.1.2 Population with secondary education..... 25.65 81		
5.1.3 Technicians and associate professionals..... 48.72 45		
5.1.4 Labour productivity per employee..... 53.87 24		
5.2 Employability..... 55.57 47		
5.2.1 Ease of finding skilled employees..... 68.91 37		
5.2.2 Relevance of education system to the economy..... 40.25 78		
5.2.3 Skills matching with secondary education..... 50.21 47		
5.2.4 Skills matching with tertiary education..... 62.91 42		

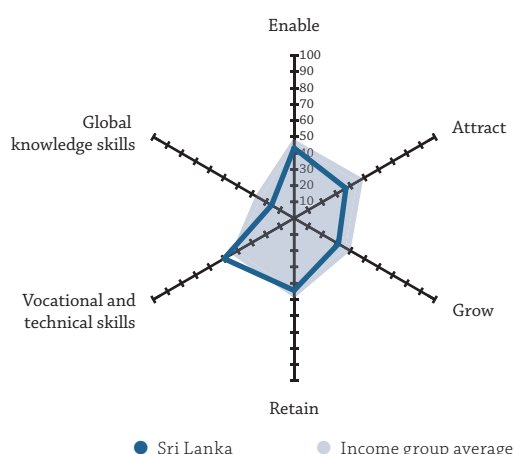
6 GLOBAL KNOWLEDGE SKILLS..... 40.99 34		
6.1 High-Level Skills..... 46.05 32		
6.1.1 Workforce with tertiary education..... 60.20 19		
6.1.2 Population with tertiary education..... 47.17 30		
6.1.3 Professionals..... 46.73 32		
6.1.4 Researchers..... 34.74 30		
6.1.5 Senior officials and managers..... 24.33 62		
6.1.6 Availability of scientists and engineers..... 63.13 34		
6.2 Talent Impact..... 35.93 37		
6.2.1 Innovation output..... 56.04 27		
6.2.2 High-value exports..... 20.97 57		
6.2.3 New product entrepreneurial activity..... 42.10 52		
6.2.4 New business density..... 15.51 38		
6.2.5 Scientific journal articles..... 45.01 25		

SRI LANKA

Key Indicators

Rank (out of 132).....	83
Income group.....	Upper-middle income
Regional group.....	Central and Southern Asia
Population (millions).....	21.67

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 43.22 85		
1.1 Regulatory Landscape..... 47.56 73		
1.1.1 Government effectiveness..... 42.88 81		
1.1.2 Rule of law..... 53.96 61		
1.1.3 Political stability..... 63.69 71		
1.1.4 Regulatory quality..... 44.86 77		
1.1.5 Corruption..... 32.43 73		
1.2 Market Landscape..... 34.75 110		
1.2.1 Competition intensity..... 63.32 79		
1.2.2 Ease of doing business..... 54.68 87		
1.2.3 Cluster development..... 44.26 56		
1.2.4 R&D expenditure..... 2.06 107		
1.2.5 ICT infrastructure..... 37.91 91		
1.2.6 Urban population..... 6.26 129		
1.3 Business and Labour Landscape..... 47.35 62		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... 79.57 68		
1.3.2 Active labour market policies..... 34.29 77		
1.3.3 Labour-employer cooperation..... 37.20 71		
1.3.4 Management Practice		
1.3.4 Professional management..... 54.93 54		
1.3.5 Relationship of pay to productivity..... 45.92 73		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 41.21 93		
1.3.7 Investment in emerging technologies..... 38.35 67		
1.3.8 Robot density..... n/a n/a		
2 ATTRACT..... 36.82 112		
2.1 External Openness..... 21.49 127		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 42.54 105		
2.1.2 Prevalence of foreign ownership..... 37.56 116		
2.1.3 Attract People		
2.1.3 Migrant stock..... 1.87 129		
2.1.4 International students..... 1.56 92		
2.1.5 Brain gain..... 23.91 111		
2.2 Internal Openness..... 52.16 90		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 11.11 121		
2.2.2 Tolerance of immigrants..... 56.16 74		
2.2.3 Social mobility..... 53.87 75		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 81.26 32		
2.2.5 Gender development gap..... 65.85 93		
2.2.6 Leadership opportunities for women..... 44.67 68		

GDP per capita (PPP US\$).....	13,449.90
GDP (US\$ billions).....	88.90
GTGI score.....	36.95
GTGI score (income group average).....	41.25

	Score	Rank
3 GROW..... 31.49 92		
3.1 Formal Education..... 9.53 115		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... 5.76 95		
3.1.2 Tertiary enrolment..... 14.48 95		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... 6.17 106		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 11.71 66		
3.2 Lifelong Learning..... 39.80 75		
3.2.1 Quality of management schools..... 61.84 36		
3.2.2 Prevalence of training in firms..... 19.79 82		
3.2.3 Employee development..... 37.77 65		
3.3 Access to Growth Opportunities..... 45.13 73		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 45.38 66		
3.3.2 Personal rights..... 72.04 71		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 66.29 90		
3.3.4 Use of virtual professional networks..... 4.75 84		
3.3.5 Collaboration within organisations..... 42.70 88		
3.3.6 Collaboration across organisations..... 39.65 66		

4 RETAIN..... 44.40 77		
4.1 Sustainability..... 32.82 93		
4.1.1 Pension system..... 32.10 65		
4.1.2 Social protection..... 38.06 77		
4.1.3 Brain retention..... 28.31 102		
4.2 Lifestyle..... 55.97 62		
4.2.1 Environmental performance..... 55.31 62		
4.2.2 Personal safety..... 60.97 50		
4.2.3 Physician density..... 13.82 87		
4.2.4 Sanitation..... 93.77 59		

5 VOCATIONAL AND TECHNICAL SKILLS..... 49.74 47		
5.1 Mid-Level Skills..... 42.60 62		
5.1.1 Workforce with secondary education..... 43.01 72		
5.1.2 Population with secondary education..... 78.32 11		
5.1.3 Technicians and associate professionals..... 28.90 74		
5.1.4 Labour productivity per employee..... 20.16 67		
5.2 Employability..... 56.88 43		
5.2.1 Ease of finding skilled employees..... 60.06 53		
5.2.2 Relevance of education system to the economy..... 51.04 52		
5.2.3 Skills matching with secondary education..... 53.60 41		
5.2.4 Skills matching with tertiary education..... 62.82 43		

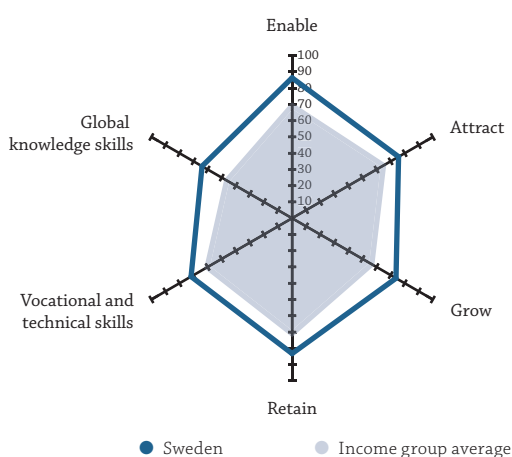
6 GLOBAL KNOWLEDGE SKILLS..... 16.02 96		
6.1 High-Level Skills..... 23.99 84		
6.1.1 Workforce with tertiary education..... 6.97 112		
6.1.2 Population with tertiary education..... 21.39 69		
6.1.3 Professionals..... 17.14 90		
6.1.4 Researchers..... 1.17 87		
6.1.5 Senior officials and managers..... 41.50 32		
6.1.6 Availability of scientists and engineers..... 55.76 53		
6.2 Talent Impact..... 8.05 113		
6.2.1 Innovation output..... 25.22 76		
6.2.2 High-value exports..... 2.64 112		
6.2.3 New product entrepreneurial activity..... n/a n/a		
6.2.4 New business density..... 2.43 86		
6.2.5 Scientific journal articles..... 1.89 83		

SWEDEN

Key Indicators

Rank (out of 132).....	4
Income group.....	High income
Regional group.....	Europe
Population (millions).....	10.18

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 86.37 4		
1.1 Regulatory Landscape.....	92.72	6
1.1.1 Government effectiveness.....	91.09	7
1.1.2 Rule of law.....	97.88	3
1.1.3 Political stability.....	86.46	20
1.1.4 Regulatory quality.....	92.23	9
1.1.5 Corruption.....	95.95	3
1.2 Market Landscape.....	82.53	5
1.2.1 Competition intensity.....	79.84	23
1.2.2 Ease of doing business.....	90.50	11
1.2.3 Cluster development.....	79.58	11
1.2.4 R&D expenditure.....	72.29	4
1.2.5 ICT infrastructure.....	87.40	12
1.2.6 Urban population.....	85.55	18
1.3 Business and Labour Landscape.....	83.86	8
Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.31	34
1.3.2 Active labour market policies.....	78.14	14
1.3.3 Labour-employer cooperation.....	80.49	9
Management Practice		
1.3.4 Professional management.....	93.43	7
1.3.5 Relationship of pay to productivity.....	66.95	29
Technology Adoption		
1.3.6 Technology utilisation.....	98.63	2
1.3.7 Investment in emerging technologies.....	91.97	3
1.3.8 Robot density.....	72.93	5
2 ATTRACT..... 75.66 10		
2.1 External Openness.....	64.60	21
Attract Business		
2.1.1 FDI and technology transfer.....	84.12	10
2.1.2 Prevalence of foreign ownership.....	79.42	24
Attract People		
2.1.3 Migrant stock.....	67.44	18
2.1.4 International students.....	24.08	32
2.1.5 Brain gain.....	67.97	22
2.2 Internal Openness.....	86.71	3
Social Inclusion		
2.2.1 Tolerance of minorities.....	92.22	4
2.2.2 Tolerance of immigrants.....	86.30	14
2.2.3 Social mobility.....	80.78	18
Gender Equality		
2.2.4 Female graduates.....	86.40	22
2.2.5 Gender development gap.....	86.01	26
2.2.6 Leadership opportunities for women.....	88.55	4

GDP per capita (PPP US\$).....	53,119.71
GDP (US\$ billions).....	551.03
GTCI score.....	75.82
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW..... 73.83 6		
3.1 Formal Education.....	52.52	16
Enrolment		
3.1.1 Vocational enrolment.....	33.43	32
3.1.2 Tertiary enrolment.....	49.98	38
Quality		
3.1.3 Tertiary education expenditure.....	45.34	9
3.1.4 Reading, maths, and science.....	73.76	22
3.1.5 University ranking.....	60.11	13
3.2 Lifelong Learning.....	83.11	5
3.2.1 Quality of management schools.....	77.73	13
3.2.2 Prevalence of training in firms.....	88.26	3
3.2.3 Employee development.....	83.35	7
3.3 Access to Growth Opportunities.....	85.85	3
Empowerment		
3.3.1 Delegation of authority.....	97.96	2
3.3.2 Personal rights.....	98.61	4
Collaboration		
3.3.3 Use of virtual social networks.....	96.42	6
3.3.4 Use of virtual professional networks.....	47.34	12
3.3.5 Collaboration within organisations.....	93.72	4
3.3.6 Collaboration across organisations.....	81.08	6

4 RETAIN..... 83.28 9		
4.1 Sustainability.....	81.15	14
4.1.1 Pension system.....	79.30	28
4.1.2 Social protection.....	85.34	14
4.1.3 Brain retention.....	78.80	12
4.2 Lifestyle.....	85.42	5
4.2.1 Environmental performance.....	88.48	5
4.2.2 Personal safety.....	87.08	12
4.2.3 Physician density.....	66.85	9
4.2.4 Sanitation.....	99.25	26

5 VOCATIONAL AND TECHNICAL SKILLS..... 71.77 7		
5.1 Mid-Level Skills.....	65.22	12
5.1.1 Workforce with secondary education.....	58.62	41
5.1.2 Population with secondary education.....	59.58	31
5.1.3 Technicians and associate professionals.....	81.09	8
5.1.4 Labour productivity per employee.....	61.60	12
5.2 Employability.....	78.31	10
5.2.1 Ease of finding skilled employees.....	78.71	16
5.2.2 Relevance of education system to the economy.....	73.21	14
5.2.3 Skills matching with secondary education.....	76.38	9
5.2.4 Skills matching with tertiary education.....	84.96	7

6 GLOBAL KNOWLEDGE SKILLS..... 63.99 5		
6.1 High-Level Skills.....	65.58	7
6.1.1 Workforce with tertiary education.....	61.91	16
6.1.2 Population with tertiary education.....	51.18	27
6.1.3 Professionals.....	75.63	2
6.1.4 Researchers.....	92.01	3
6.1.5 Senior officials and managers.....	37.33	38
6.1.6 Availability of scientists and engineers.....	75.38	15
6.2 Talent Impact.....	62.40	7
6.2.1 Innovation output.....	88.44	3
6.2.2 High-value exports.....	37.16	30
6.2.3 New product entrepreneurial activity.....	67.83	13
6.2.4 New business density.....	38.95	18
6.2.5 Scientific journal articles.....	79.62	5

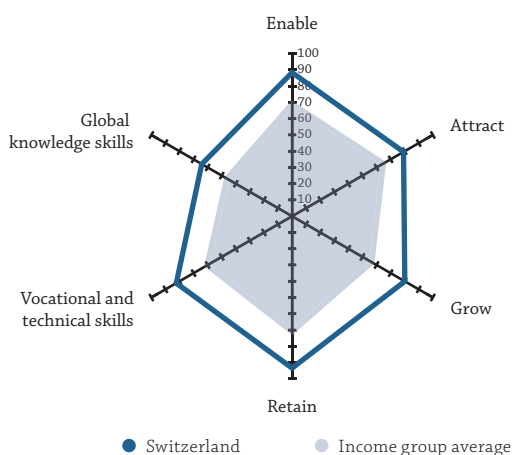
SWITZERLAND

Key Indicators

Rank (out of 132).....	1
Income group.....	High income
Regional group.....	Europe
Population (millions).....	8.52

GDP per capita (PPP US\$)	68,943.37
GDP (US\$ billions)	705.50
GTCI score.....	81.26
GTCI score (income group average)	61.46

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	88.39	2
1.1 Regulatory Landscape.....	95.18	3
1.1.1 Government effectiveness.....	96.39	2
1.1.2 Rule of law.....	97.68	4
1.1.3 Political stability.....	91.55	6
1.1.4 Regulatory quality.....	94.32	6
1.1.5 Corruption.....	95.95	3
1.2 Market Landscape.....	81.27	8
1.2.1 Competition intensity.....	80.48	21
1.2.2 Ease of doing business.....	80.53	35
1.2.3 Cluster development.....	91.86	3
1.2.4 R&D expenditure.....	73.65	3
1.2.5 ICT infrastructure.....	91.22	6
1.2.6 Urban population.....	69.87	46
1.3 Business and Labour Landscape.....	88.71	3
Labour Market		
1.3.1 Tertiary-educated unemployment.....	88.64	32
1.3.2 Active labour market policies.....	100.00	1
1.3.3 Labour-employer cooperation.....	100.00	1
Management Practice		
1.3.4 Professional management.....	96.76	4
1.3.5 Relationship of pay to productivity.....	95.38	2
Technology Adoption		
1.3.6 Technology utilisation.....	96.15	3
1.3.7 Investment in emerging technologies.....	89.43	4
1.3.8 Robot density.....	43.32	17
2 ATTRACT.....	79.19	6
2.1 External Openness.....	82.47	4
Attract Business		
2.1.1 FDI and technology transfer.....	83.21	12
2.1.2 Prevalence of foreign ownership.....	85.54	10
Attract People		
2.1.3 Migrant stock.....	79.02	11
2.1.4 International students.....	64.57	7
2.1.5 Brain gain.....	100.00	1
2.2 Internal Openness.....	75.91	16
Social Inclusion		
2.2.1 Tolerance of minorities.....	74.44	20
2.2.2 Tolerance of immigrants.....	71.23	38
2.2.3 Social mobility.....	100.00	1
Gender Equality		
2.2.4 Female graduates.....	52.25	91
2.2.5 Gender development gap.....	84.16	37
2.2.6 Leadership opportunities for women.....	73.38	21

	Score	Rank
3 GROW.....	80.08	2
3.1 Formal Education.....	59.49	6
Enrolment		
3.1.1 Vocational enrolment.....	57.92	9
3.1.2 Tertiary enrolment.....	45.45	48
Quality		
3.1.3 Tertiary education expenditure.....	31.17	32
3.1.4 Reading, maths, and science.....	78.69	12
3.1.5 University ranking.....	84.21	4
3.2 Lifelong Learning.....	100.00	1
3.2.1 Quality of management schools.....	100.00	1
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	100.00	1
3.3 Access to Growth Opportunities.....	80.77	6
Empowerment		
3.3.1 Delegation of authority.....	94.29	3
3.3.2 Personal rights.....	97.66	8
Collaboration		
3.3.3 Use of virtual social networks.....	84.80	35
3.3.4 Use of virtual professional networks.....	27.53	25
3.3.5 Collaboration within organisations.....	100.00	1
3.3.6 Collaboration across organisations.....	80.32	8

4 RETAIN.....	93.44	1
4.1 Sustainability.....	97.70	1
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	95.40	8
4.1.3 Brain retention.....	100.00	1
4.2 Lifestyle.....	89.19	1
4.2.1 Environmental performance.....	100.00	1
4.2.2 Personal safety.....	89.06	8
4.2.3 Physician density.....	67.82	7
4.2.4 Sanitation.....	99.88	15

5 VOCATIONAL AND TECHNICAL SKILLS.....	82.27	2
5.1 Mid-Level Skills.....	68.25	7
5.1.1 Workforce with secondary education.....	60.38	36
5.1.2 Population with secondary education.....	67.01	24
5.1.3 Technicians and associate professionals.....	83.33	7
5.1.4 Labour productivity per employee.....	62.27	11
5.2 Employability.....	96.29	2
5.2.1 Ease of finding skilled employees.....	85.17	6
5.2.2 Relevance of education system to the economy.....	100.00	1
5.2.3 Skills matching with secondary education.....	100.00	1
5.2.4 Skills matching with tertiary education.....	100.00	1

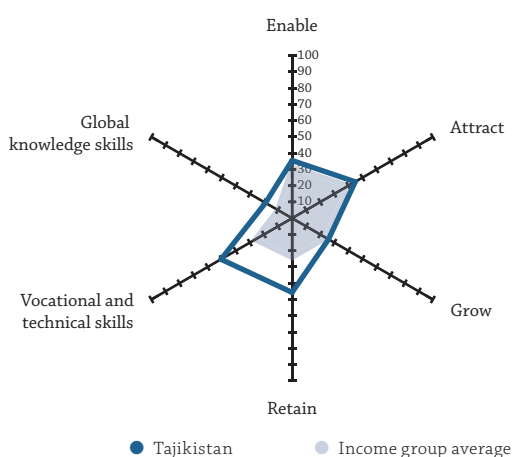
6 GLOBAL KNOWLEDGE SKILLS.....	64.17	4
6.1 High-Level Skills.....	65.01	9
6.1.1 Workforce with tertiary education.....	61.86	17
6.1.2 Population with tertiary education.....	58.39	14
6.1.3 Professionals.....	66.62	8
6.1.4 Researchers.....	63.68	10
6.1.5 Senior officials and managers.....	58.11	17
6.1.6 Availability of scientists and engineers.....	81.44	7
6.2 Talent Impact.....	63.34	6
6.2.1 Innovation output.....	100.00	1
6.2.2 High-value exports.....	32.73	37
6.2.3 New product entrepreneurial activity.....	63.24	20
6.2.4 New business density.....	20.71	29
6.2.5 Scientific journal articles.....	100.00	1

TAJIKISTAN

Key Indicators

Rank (out of 132).....	84
Income group	Low income
Regional group	Central and Southern Asia
Population (millions)	9.10

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....35.55 107		
1.1 Regulatory Landscape.....25.54 126		
1.1.1 Government effectiveness.....19.38 125		
1.1.2 Rule of law.....21.04 127		
1.1.3 Political stability.....50.35 102		
1.1.4 Regulatory quality.....22.06 126		
1.1.5 Corruption.....14.86 120		
1.2 Market Landscape.....30.96 118		
1.2.1 Competition intensity.....56.52 102		
1.2.2 Ease of doing business.....47.34 105		
1.2.3 Cluster development.....32.50 95		
1.2.4 R&D expenditure.....2.21 105		
1.2.5 ICT infrastructure.....n/a n/a		
1.2.6 Urban population.....16.22 122		
1.3 Business and Labour Landscape.....50.16 55		
Labour Market		
1.3.1 Tertiary-educated unemployment.....81.92 62		
1.3.2 Active labour market policies.....54.93 47		
1.3.3 Labour-employer cooperation.....36.81 72		
Management Practice		
1.3.4 Professional management.....28.12 117		
1.3.5 Relationship of pay to productivity.....65.85 30		
Technology Adoption		
1.3.6 Technology utilisation.....41.59 92		
1.3.7 Investment in emerging technologies.....41.88 96		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....44.86 89		
2.1 External Openness.....35.53 92		
Attract Business		
2.1.1 FDI and technology transfer.....46.89 96		
2.1.2 Prevalence of foreign ownership.....38.01 114		
Attract People		
2.1.3 Migrant stock.....42.68 60		
2.1.4 International students.....3.00 85		
2.1.5 Brain gain.....47.06 54		
2.2 Internal Openness.....54.19 77		
Social Inclusion		
2.2.1 Tolerance of minorities.....35.56 84		
2.2.2 Tolerance of immigrants.....64.38 55		
2.2.3 Social mobility.....58.21 61		
Gender Equality		
2.2.4 Female graduates.....36.07 102		
2.2.5 Gender development gap.....65.11 95		
2.2.6 Leadership opportunities for women.....65.80 31		

GDP per capita (PPP US\$)	3,443.70
GDP (US\$ billions)	7.52
GTCI score.....	36.89
GTCI score (income group average)	26.01

	Score	Rank
3 GROW.....25.89 115		
3.1 Formal Education.....9.07 117		
Enrolment		
3.1.1 Vocational enrolment.....2.13 110		
3.1.2 Tertiary enrolment.....23.96 81		
Quality		
3.1.3 Tertiary education expenditure.....10.21 94		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....37.63 84		
3.2.1 Quality of management schools.....47.81 63		
3.2.2 Prevalence of training in firms.....39.18 43		
3.2.3 Employee development.....25.90 110		
3.3 Access to Growth Opportunities.....30.95 121		
Empowerment		
3.3.1 Delegation of authority.....41.00 80		
3.3.2 Personal rights.....4.79 129		
Collaboration		
3.3.3 Use of virtual social networks.....37.01 125		
3.3.4 Use of virtual professional networks.....0.10 123		
3.3.5 Collaboration within organisations.....53.17 46		
3.3.6 Collaboration across organisations.....49.66 35		

4 RETAIN.....45.64 71		
4.1 Sustainability.....39.85 69		
4.1.1 Pension system.....28.56 73		
4.1.2 Social protection.....46.33 57		
4.1.3 Brain retention.....44.66 51		
4.2 Lifestyle.....51.43 74		
4.2.1 Environmental performance.....34.04 102		
4.2.2 Personal safety.....49.34 73		
4.2.3 Physician density.....27.18 68		
4.2.4 Sanitation.....95.15 53		

5 VOCATIONAL AND TECHNICAL SKILLS.....50.51 45		
5.1 Mid-Level Skills.....49.83 49		
5.1.1 Workforce with secondary education.....86.98 7		
5.1.2 Population with secondary education.....81.58 7		
5.1.3 Technicians and associate professionals.....24.53 83		
5.1.4 Labour productivity per employee.....6.22 96		
5.2 Employability.....51.20 58		
5.2.1 Ease of finding skilled employees.....50.53 82		
5.2.2 Relevance of education system to the economy.....52.09 50		
5.2.3 Skills matching with secondary education.....49.29 50		
5.2.4 Skills matching with tertiary education.....52.88 72		

6 GLOBAL KNOWLEDGE SKILLS.....18.90 87		
6.1 High-Level Skills.....29.70 65		
6.1.1 Workforce with tertiary education.....23.29 78		
6.1.2 Population with tertiary education.....35.59 43		
6.1.3 Professionals.....19.22 82		
6.1.4 Researchers.....n/a n/a		
6.1.5 Senior officials and managers.....15.28 79		
6.1.6 Availability of scientists and engineers.....55.09 54		
6.2 Talent Impact.....8.10 111		
6.2.1 Innovation output.....23.29 81		
6.2.2 High-value exports.....n/a n/a		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....0.83 93		
6.2.5 Scientific journal articles.....0.18 120		

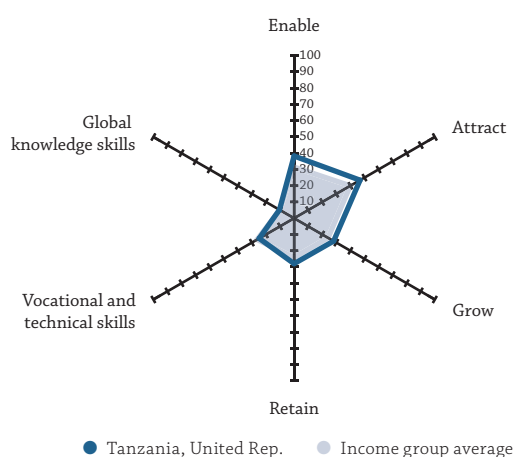
TANZANIA, UNITED REP.

Key Indicators

Rank (out of 132).....	111
Income group.....	Low income
Regional group.....	Sub-Saharan Africa
Population (millions).....	56.32

GDP per capita (PPP US\$)	3,227.03
GDP (US\$ billions)	57.44
GTCI score.....	29.40
GTCI score (income group average)	26.01

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	38.28	99
1.1 Regulatory Landscape.....	37.86	99
1.1.1 Government effectiveness.....	31.28	107
1.1.2 Rule of law.....	42.23	95
1.1.3 Political stability.....	52.21	98
1.1.4 Regulatory quality.....	33.87	108
1.1.5 Corruption.....	29.73	81
1.2 Market Landscape.....	31.24	117
1.2.1 Competition intensity.....	53.42	109
1.2.2 Ease of doing business.....	41.12	114
1.2.3 Cluster development.....	47.10	52
1.2.4 R&D expenditure.....	11.28	60
1.2.5 ICT infrastructure.....	10.69	122
1.2.6 Urban population.....	23.85	118
1.3 Business and Labour Landscape.....	45.73	68
Labour Market		
1.3.1 Tertiary-educated unemployment.....	83.59	53
1.3.2 Active labour market policies.....	39.04	67
1.3.3 Labour-employer cooperation.....	34.34	81
Management Practice		
1.3.4 Professional management.....	45.65	76
1.3.5 Relationship of pay to productivity.....	36.75	98
Technology Adoption		
1.3.6 Technology utilisation.....	39.07	99
1.3.7 Investment in emerging technologies.....	41.64	57
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	46.85	77
2.1 External Openness.....	40.33	77
Attract Business		
2.1.1 FDI and technology transfer.....	48.61	90
2.1.2 Prevalence of foreign ownership.....	45.49	101
Attract People		
2.1.3 Migrant stock.....	20.93	100
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	46.30	59
2.2 Internal Openness.....	53.37	83
Social Inclusion		
2.2.1 Tolerance of minorities.....	55.56	49
2.2.2 Tolerance of immigrants.....	49.32	83
2.2.3 Social mobility.....	58.96	58
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	63.24	101
2.2.6 Leadership opportunities for women.....	39.77	84

	Score	Rank
3 GROW.....	28.10	106
3.1 Formal Education.....	4.77	124
Enrolment		
3.1.1 Vocational enrolment.....	0.59	116
3.1.2 Tertiary enrolment.....	2.50	124
Quality		
3.1.3 Tertiary education expenditure.....	16.00	79
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	32.56	107
3.2.1 Quality of management schools.....	31.00	111
3.2.2 Prevalence of training in firms.....	36.02	50
3.2.3 Employee development.....	30.65	92
3.3 Access to Growth Opportunities.....	46.97	66
Empowerment		
3.3.1 Delegation of authority.....	42.75	74
3.3.2 Personal rights.....	57.70	92
Collaboration		
3.3.3 Use of virtual social networks.....	46.63	117
3.3.4 Use of virtual professional networks.....	n/a	n/a
3.3.5 Collaboration within organisations.....	45.28	74
3.3.6 Collaboration across organisations.....	42.52	55

4 RETAIN.....	27.96	111
4.1 Sustainability.....	29.43	100
4.1.1 Pension system.....	4.30	107
4.1.2 Social protection.....	44.69	63
4.1.3 Brain retention.....	39.32	71
4.2 Lifestyle.....	26.48	111
4.2.1 Environmental performance.....	39.01	96
4.2.2 Personal safety.....	49.14	74
4.2.3 Physician density.....	0.05	125
4.2.4 Sanitation.....	17.71	125

5 VOCATIONAL AND TECHNICAL SKILLS.....	24.80	122
5.1 Mid-Level Skills.....	3.95	128
5.1.1 Workforce with secondary education.....	4.21	122
5.1.2 Population with secondary education.....	0.73	114
5.1.3 Technicians and associate professionals.....	8.17	114
5.1.4 Labour productivity per employee.....	2.68	103
5.2 Employability.....	45.65	76
5.2.1 Ease of finding skilled employees.....	52.84	73
5.2.2 Relevance of education system to the economy.....	42.49	69
5.2.3 Skills matching with secondary education.....	35.02	83
5.2.4 Skills matching with tertiary education.....	52.26	73

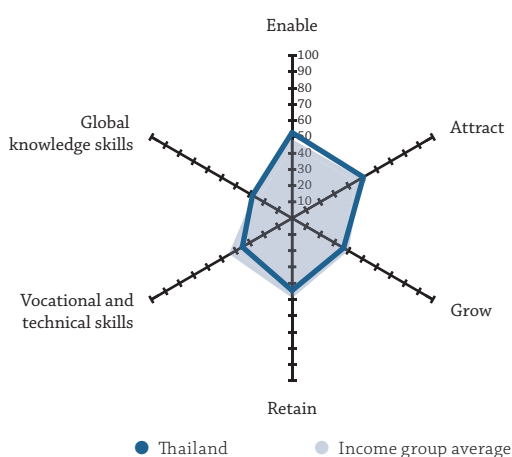
6 GLOBAL KNOWLEDGE SKILLS.....	10.39	118
6.1 High-Level Skills.....	9.32	123
6.1.1 Workforce with tertiary education.....	0.73	125
6.1.2 Population with tertiary education.....	1.37	105
6.1.3 Professionals.....	1.27	126
6.1.4 Researchers.....	0.09	108
6.1.5 Senior officials and managers.....	0.84	126
6.1.6 Availability of scientists and engineers.....	51.63	60
6.2 Talent Impact.....	11.46	101
6.2.1 Innovation output.....	26.97	72
6.2.2 High-value exports.....	7.04	92
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	0.36	114

THAILAND

Key Indicators

Rank (out of 132).....	67
Income group.....	Upper-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	69.43

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	52.68	50
1.1 Regulatory Landscape.....	47.84	71
1.1.1 Government effectiveness.....	55.86	49
1.1.2 Rule of law.....	53.69	62
1.1.3 Political stability.....	48.39	105
1.1.4 Regulatory quality.....	51.54	64
1.1.5 Corruption.....	29.73	81
1.2 Market Landscape.....	53.09	60
1.2.1 Competition intensity.....	78.27	33
1.2.2 Ease of doing business.....	85.46	25
1.2.3 Cluster development.....	47.22	51
1.2.4 R&D expenditure.....	16.81	45
1.2.5 ICT infrastructure.....	48.35	74
1.2.6 Urban population.....	42.45	98
1.3 Business and Labour Landscape.....	57.11	40
1.3.1 Labour Market		
1.3.1.1 Tertiary-educated unemployment.....	94.92	6
1.3.2 Active labour market policies.....	51.73	51
1.3.3 Labour-employer cooperation.....	55.45	34
1.3.4 Management Practice		
1.3.4.1 Professional management.....	56.38	49
1.3.5 Relationship of pay to productivity.....	65.62	34
1.3.6 Technology Adoption		
1.3.6.1 Technology utilisation.....	63.17	46
1.3.7 Investment in emerging technologies.....	54.44	36
1.3.8 Robot density.....	15.19	27
2 ATTRACT.....	50.61	60
2.1 External Openness.....	46.26	55
2.1.1 Attract Business		
2.1.1.1 FDI and technology transfer.....	67.84	41
2.1.2 Prevalence of foreign ownership.....	62.93	56
2.1.3 Attract People		
2.1.3.1 Migrant stock.....	41.65	61
2.1.4 International students.....	4.71	78
2.1.5 Brain gain.....	54.16	40
2.2 Internal Openness.....	54.96	69
2.2.1 Social Inclusion		
2.2.1.1 Tolerance of minorities.....	23.33	100
2.2.2 Tolerance of immigrants.....	23.29	116
2.2.3 Social mobility.....	56.03	70
2.2.4 Gender Equality		
2.2.4.1 Female graduates.....	70.38	68
2.2.5 Gender development gap.....	87.52	22
2.2.6 Leadership opportunities for women.....	69.23	25

GDP per capita (PPP US\$).....	19,017.74
GDP (US\$ billions).....	504.99
GTCI score.....	41.30
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	36.59	72
3.1 Formal Education.....	26.33	65
3.1.1 Enrolment		
3.1.1.1 Vocational enrolment.....	15.84	65
3.1.2 Tertiary enrolment.....	38.62	56
3.1.3 Quality		
3.1.3.1 Tertiary education expenditure.....	13.33	90
3.1.4 Reading, maths, and science.....	35.88	55
3.1.5 University ranking.....	27.99	43
3.2 Lifelong Learning.....	38.46	82
3.2.1 Quality of management schools.....	45.75	71
3.2.2 Prevalence of training in firms.....	19.26	83
3.2.3 Employee development.....	50.35	44
3.3 Access to Growth Opportunities.....	44.98	75
3.3.1 Empowerment		
3.3.1.1 Delegation of authority.....	50.95	57
3.3.2 Personal rights.....	31.02	115
3.3.3 Collaboration		
3.3.3.1 Use of virtual social networks.....	89.70	14
3.3.4 Use of virtual professional networks.....	1.89	105
3.3.5 Collaboration within organisations.....	52.25	48
3.3.6 Collaboration across organisations.....	44.07	50

4 RETAIN.....	44.42	76
4.1 Sustainability.....	45.18	57
4.1.1 Pension system.....	31.90	67
4.1.2 Social protection.....	47.02	54
4.1.3 Brain retention.....	56.61	38
4.2 Lifestyle.....	43.66	93
4.2.1 Environmental performance.....	37.42	98
4.2.2 Personal safety.....	35.36	102
4.2.3 Physician density.....	7.23	99
4.2.4 Sanitation.....	94.63	54

5 VOCATIONAL AND TECHNICAL SKILLS.....	35.36	86
5.1 Mid-Level Skills.....	21.41	100
5.1.1 Workforce with secondary education.....	28.71	89
5.1.2 Population with secondary education.....	18.03	98
5.1.3 Technicians and associate professionals.....	19.23	93
5.1.4 Labour productivity per employee.....	19.68	69
5.2 Employability.....	49.31	64
5.2.1 Ease of finding skilled employees.....	49.42	84
5.2.2 Relevance of education system to the economy.....	46.03	63
5.2.3 Skills matching with secondary education.....	40.51	74
5.2.4 Skills matching with tertiary education.....	61.29	49

6 GLOBAL KNOWLEDGE SKILLS.....	28.16	61
6.1 High-Level Skills.....	26.58	72
6.1.1 Workforce with tertiary education.....	24.12	75
6.1.2 Population with tertiary education.....	29.54	56
6.1.3 Professionals.....	13.83	99
6.1.4 Researchers.....	14.56	47
6.1.5 Senior officials and managers.....	21.42	67
6.1.6 Availability of scientists and engineers.....	55.98	52
6.2 Talent Impact.....	29.73	49
6.2.1 Innovation output.....	42.56	41
6.2.2 High-value exports.....	64.06	10
6.2.3 New product entrepreneurial activity.....	31.86	63
6.2.4 New business density.....	4.73	71
6.2.5 Scientific journal articles.....	5.47	66

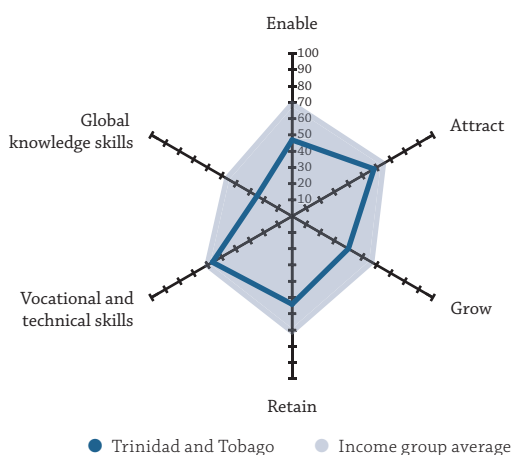
TRINIDAD AND TOBAGO

Key Indicators

Rank (out of 132).....	50
Income group.....	High income
Regional group.....	Latin America and the Caribbean
Population (millions).....	1.39

GDP per capita (PPP US\$).....	32,227.85
GDP (US\$ billions).....	23.41
GTCI score.....	46.78
GTCI score (income group average).....	61.46

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	46.92	72
1.1 Regulatory Landscape.....	51.90	58
1.1.1 Government effectiveness.....	52.84	54
1.1.2 Rule of law.....	50.13	68
1.1.3 Political stability.....	71.35	50
1.1.4 Regulatory quality.....	48.70	67
1.1.5 Corruption.....	36.49	63
1.2 Market Landscape.....	45.94	77
1.2.1 Competition intensity.....	66.05	73
1.2.2 Ease of doing business.....	53.95	90
1.2.3 Cluster development.....	37.80	79
1.2.4 R&D expenditure.....	1.69	111
1.2.5 ICT infrastructure.....	69.97	47
1.2.6 Urban population.....	46.17	92
1.3 Business and Labour Landscape.....	42.91	75
Labour Market		
1.3.1 Tertiary-educated unemployment.....	93.00	12
1.3.2 Active labour market policies.....	34.08	78
1.3.3 Labour-employer cooperation.....	0.00	132
Management Practice		
1.3.4 Professional management.....	57.10	46
1.3.5 Relationship of pay to productivity.....	47.73	69
Technology Adoption		
1.3.6 Technology utilisation.....	46.17	77
1.3.7 Investment in emerging technologies.....	22.32	115
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....	58.18	38
2.1 External Openness.....	48.52	49
Attract Business		
2.1.1 FDI and technology transfer.....	56.14	70
2.1.2 Prevalence of foreign ownership.....	53.78	80
Attract People		
2.1.3 Migrant stock.....	35.37	72
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	48.79	51
2.2 Internal Openness.....	67.84	30
Social Inclusion		
2.2.1 Tolerance of minorities.....	71.11	27
2.2.2 Tolerance of immigrants.....	57.53	69
2.2.3 Social mobility.....	65.94	39
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	93.43	9
2.2.6 Leadership opportunities for women.....	51.18	56

	Score	Rank
3 GROW.....	39.98	61
3.1 Formal Education.....	19.76	79
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	n/a	n/a
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	39.52	49
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	50.71	47
3.2.1 Quality of management schools.....	64.90	32
3.2.2 Prevalence of training in firms.....	32.45	56
3.2.3 Employee development.....	54.77	36
3.3 Access to Growth Opportunities.....	49.47	53
Empowerment		
3.3.1 Delegation of authority.....	51.33	55
3.3.2 Personal rights.....	90.97	34
Collaboration		
3.3.3 Use of virtual social networks.....	77.97	56
3.3.4 Use of virtual professional networks.....	27.85	24
3.3.5 Collaboration within organisations.....	30.25	118
3.3.6 Collaboration across organisations.....	18.48	124

4 RETAIN.....	54.13	56
4.1 Sustainability.....	52.42	43
4.1.1 Pension system.....	68.80	40
4.1.2 Social protection.....	44.70	62
4.1.3 Brain retention.....	43.75	58
4.2 Lifestyle.....	55.85	63
4.2.1 Environmental performance.....	66.56	34
4.2.2 Personal safety.....	36.39	100
4.2.3 Physician density.....	28.90	63
4.2.4 Sanitation.....	91.55	66

5 VOCATIONAL AND TECHNICAL SKILLS.....	56.55	34
5.1 Mid-Level Skills.....	57.50	29
5.1.1 Workforce with secondary education.....	67.11	29
5.1.2 Population with secondary education.....	65.79	25
5.1.3 Technicians and associate professionals.....	57.87	29
5.1.4 Labour productivity per employee.....	39.22	43
5.2 Employability.....	55.60	46
5.2.1 Ease of finding skilled employees.....	65.30	45
5.2.2 Relevance of education system to the economy.....	51.92	51
5.2.3 Skills matching with secondary education.....	49.94	48
5.2.4 Skills matching with tertiary education.....	55.23	65

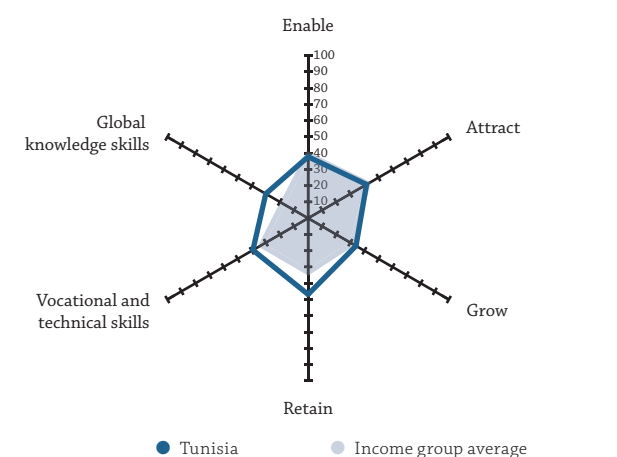
6 GLOBAL KNOWLEDGE SKILLS.....	24.91	71
6.1 High-Level Skills.....	36.61	48
6.1.1 Workforce with tertiary education.....	32.50	60
6.1.2 Population with tertiary education.....	14.00	81
6.1.3 Professionals.....	15.29	96
6.1.4 Researchers.....	n/a	n/a
6.1.5 Senior officials and managers.....	64.49	11
6.1.6 Availability of scientists and engineers.....	56.80	50
6.2 Talent Impact.....	13.20	93
6.2.1 Innovation output.....	19.44	96
6.2.2 High-value exports.....	0.37	123
6.2.3 New product entrepreneurial activity.....	27.70	68
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	5.29	67

TUNISIA

Key Indicators

Rank (out of 132).....	79
Income group.....	Lower-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	11.57

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....37.83 102		
1.1 Regulatory Landscape.....43.65 82		
1.1.1 Government effectiveness.....44.87 76		
1.1.2 Rule of law.....54.33 59		
1.1.3 Political stability.....41.90 116		
1.1.4 Regulatory quality.....37.98 99		
1.1.5 Corruption.....39.19 59		
1.2 Market Landscape.....45.67 78		
1.2.1 Competition intensity.....62.91 81		
1.2.2 Ease of doing business.....63.42 74		
1.2.3 Cluster development.....26.96 103		
1.2.4 R&D expenditure.....12.83 54		
1.2.5 ICT infrastructure.....43.64 81		
1.2.6 Urban population.....64.29 55		
1.3 Business and Labour Landscape.....24.17 127		
Labour Market		
1.3.1 Tertiary-educated unemployment.....0.00 123		
1.3.2 Active labour market policies.....34.31 76		
1.3.3 Labour-employer cooperation.....16.34 116		
Management Practice		
1.3.4 Professional management.....41.18 87		
1.3.5 Relationship of pay to productivity.....28.78 121		
Technology Adoption		
1.3.6 Technology utilisation.....36.16 107		
1.3.7 Investment in emerging technologies.....35.63 78		
1.3.8 Robot density.....0.95 53		
2 ATTRACT.....41.52 101		
2.1 External Openness.....27.83 116		
Attract Business		
2.1.1 FDI and technology transfer.....48.78 88		
2.1.2 Prevalence of foreign ownership.....51.00 90		
Attract People		
2.1.3 Migrant stock.....9.41 120		
2.1.4 International students.....8.20 66		
2.1.5 Brain gain.....21.76 114		
2.2 Internal Openness.....55.20 68		
Social Inclusion		
2.2.1 Tolerance of minorities.....32.22 88		
2.2.2 Tolerance of immigrants.....45.21 91		
2.2.3 Social mobility.....58.12 62		
Gender Equality		
2.2.4 Female graduates.....100.00 1		
2.2.5 Gender development gap.....52.39 110		
2.2.6 Leadership opportunities for women.....43.28 74		

GDP per capita (PPP US\$).....	12,483.51
GDP (US\$ billions).....	39.86
GTCI score.....	38.25
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....34.04 81		
3.1 Formal Education.....18.33 80		
Enrolment		
3.1.1 Vocational enrolment.....13.98 73		
3.1.2 Tertiary enrolment.....24.91 79		
Quality		
3.1.3 Tertiary education expenditure.....37.55 17		
3.1.4 Reading, maths, and science.....15.24 64		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....38.68 81		
3.2.1 Quality of management schools.....47.01 66		
3.2.2 Prevalence of training in firms.....33.64 52		
3.2.3 Employee development.....35.40 77		
3.3 Access to Growth Opportunities.....45.09 74		
Empowerment		
3.3.1 Delegation of authority.....30.97 112		
3.3.2 Personal rights.....84.09 44		
Collaboration		
3.3.3 Use of virtual social networks.....80.80 46		
3.3.4 Use of virtual professional networks.....9.13 64		
3.3.5 Collaboration within organisations.....42.45 89		
3.3.6 Collaboration across organisations.....23.10 113		

4 RETAIN.....46.86 66		
4.1 Sustainability.....38.77 72		
4.1.1 Pension system.....61.00 46		
4.1.2 Social protection.....33.76 84		
4.1.3 Brain retention.....21.55 113		
4.2 Lifestyle.....54.95 68		
4.2.1 Environmental performance.....58.21 51		
4.2.2 Personal safety.....48.60 79		
4.2.3 Physician density.....20.37 76		
4.2.4 Sanitation.....92.60 63		

5 VOCATIONAL AND TECHNICAL SKILLS.....39.20 78		
5.1 Mid-Level Skills.....37.24 70		
5.1.1 Workforce with secondary education.....52.17 55		
5.1.2 Population with secondary education.....40.80 60		
5.1.3 Technicians and associate professionals.....32.49 65		
5.1.4 Labour productivity per employee.....23.51 63		
5.2 Employability.....41.16 90		
5.2.1 Ease of finding skilled employees.....56.81 62		
5.2.2 Relevance of education system to the economy.....33.89 92		
5.2.3 Skills matching with secondary education.....34.66 86		
5.2.4 Skills matching with tertiary education.....39.27 106		

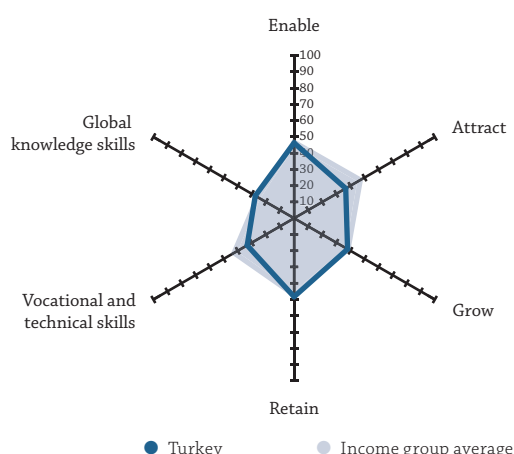
6 GLOBAL KNOWLEDGE SKILLS.....30.06 53		
6.1 High-Level Skills.....32.86 57		
6.1.1 Workforce with tertiary education.....28.69 65		
6.1.2 Population with tertiary education.....23.12 65		
6.1.3 Professionals.....17.01 92		
6.1.4 Researchers.....23.72 40		
6.1.5 Senior officials and managers.....40.16 33		
6.1.6 Availability of scientists and engineers.....64.44 33		
6.2 Talent Impact.....27.27 52		
6.2.1 Innovation output.....29.95 64		
6.2.2 High-value exports.....15.58 67		
6.2.3 New product entrepreneurial activity.....64.35 16		
6.2.4 New business density.....8.02 56		
6.2.5 Scientific journal articles.....18.43 44		

TURKEY

Key Indicators

Rank (out of 132).....	78
Income group.....	Upper-middle income
Regional group.....	Northern Africa and Western Asia
Population (millions).....	82.32

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	46.33	77
1.1 Regulatory Landscape.....	41.22	90
1.1.1 Government effectiveness.....	48.25	68
1.1.2 Rule of law.....	46.82	77
1.1.3 Political stability.....	25.57	125
1.1.4 Regulatory quality.....	48.95	66
1.1.5 Corruption.....	36.49	63
1.2 Market Landscape.....	59.60	38
1.2.1 Competition intensity.....	88.78	5
1.2.2 Ease of doing business.....	78.10	40
1.2.3 Cluster development.....	39.77	75
1.2.4 R&D expenditure.....	20.76	37
1.2.5 ICT infrastructure.....	58.78	64
1.2.6 Urban population.....	71.42	42
1.3 Business and Labour Landscape.....	38.18	92
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	59.79	103
1.3.2 Active labour market policies.....	50.78	54
1.3.3 Labour-employer cooperation.....	21.93	108
1.3.4 Management Practice		
1.3.4 Professional management.....	46.36	74
1.3.5 Relationship of pay to productivity.....	38.40	92
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	51.73	65
1.3.7 Investment in emerging technologies.....	27.62	102
1.3.8 Robot density.....	8.83	34
2 ATTRACT.....	36.68	114
2.1 External Openness.....	33.68	99
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	54.51	72
2.1.2 Prevalence of foreign ownership.....	41.11	111
2.1.3 Attract People		
2.1.3 Migrant stock.....	44.49	57
2.1.4 International students.....	4.73	77
2.1.5 Brain gain.....	23.57	112
2.2 Internal Openness.....	39.67	122
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	0.00	130
2.2.2 Tolerance of immigrants.....	52.05	81
2.2.3 Social mobility.....	48.81	92
2.2.4 Gender Equality		
2.2.4 Female graduates.....	53.13	89
2.2.5 Gender development gap.....	61.08	105
2.2.6 Leadership opportunities for women.....	22.98	116

GDP per capita (PPP US\$).....	28,815.54
GDP (US\$ billions).....	766.51
GTCI score.....	38.37
GTCI score (income group average).....	41.25

	Score	Rank
3 GROW.....	37.99	67
3.1 Formal Education.....	44.09	31
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	38.71	27
3.1.2 Tertiary enrolment.....	81.98	3
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	35.08	22
3.1.4 Reading, maths, and science.....	40.33	48
3.1.5 University ranking.....	24.37	45
3.2 Lifelong Learning.....	28.42	118
3.2.1 Quality of management schools.....	25.41	119
3.2.2 Prevalence of training in firms.....	32.98	53
3.2.3 Employee development.....	26.87	104
3.3 Access to Growth Opportunities.....	41.46	92
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	45.23	67
3.3.2 Personal rights.....	24.70	119
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	85.07	33
3.3.4 Use of virtual professional networks.....	15.94	41
3.3.5 Collaboration within organisations.....	39.13	96
3.3.6 Collaboration across organisations.....	38.71	71

4 RETAIN.....	48.32	62
4.1 Sustainability.....	45.28	56
4.1.1 Pension system.....	52.12	51
4.1.2 Social protection.....	56.03	41
4.1.3 Brain retention.....	27.67	103
4.2 Lifestyle.....	51.36	75
4.2.1 Environmental performance.....	42.56	88
4.2.2 Personal safety.....	39.03	95
4.2.3 Physician density.....	27.74	66
4.2.4 Sanitation.....	96.10	48

5 VOCATIONAL AND TECHNICAL SKILLS.....	33.32	97
5.1 Mid-Level Skills.....	30.40	84
5.1.1 Workforce with secondary education.....	27.72	91
5.1.2 Population with secondary education.....	23.84	89
5.1.3 Technicians and associate professionals.....	25.42	81
5.1.4 Labour productivity per employee.....	44.63	32
5.2 Employability.....	36.23	104
5.2.1 Ease of finding skilled employees.....	37.41	111
5.2.2 Relevance of education system to the economy.....	28.22	107
5.2.3 Skills matching with secondary education.....	33.27	90
5.2.4 Skills matching with tertiary education.....	46.04	88

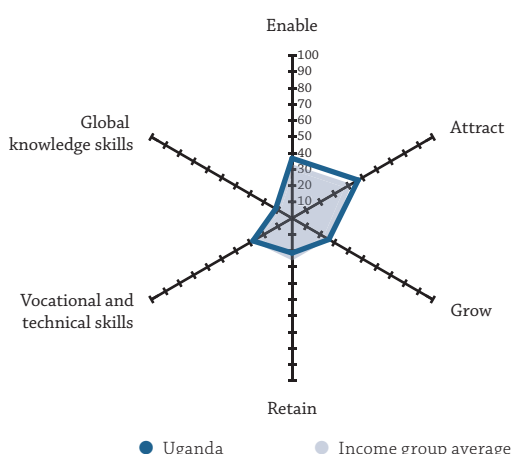
6 GLOBAL KNOWLEDGE SKILLS.....	27.58	63
6.1 High-Level Skills.....	29.15	67
6.1.1 Workforce with tertiary education.....	35.41	55
6.1.2 Population with tertiary education.....	25.36	63
6.1.3 Professionals.....	26.84	65
6.1.4 Researchers.....	16.69	43
6.1.5 Senior officials and managers.....	30.94	47
6.1.6 Availability of scientists and engineers.....	39.66	89
6.2 Talent Impact.....	26.02	53
6.2.1 Innovation output.....	38.88	48
6.2.2 High-value exports.....	7.53	91
6.2.3 New product entrepreneurial activity.....	61.25	21
6.2.4 New business density.....	5.63	66
6.2.5 Scientific journal articles.....	16.80	45

UGANDA

Key Indicators

Rank (out of 132).....	113
Income group	Low income
Regional group	Sub-Saharan Africa
Population (millions)	42.72

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 36.88 103		
1.1 Regulatory Landscape..... 37.95 98		
1.1.1 Government effectiveness..... 32.38 101		
1.1.2 Rule of law..... 45.75 82		
1.1.3 Political stability..... 52.78 96		
1.1.4 Regulatory quality..... 42.63 85		
1.1.5 Corruption..... 16.22 118		
1.2 Market Landscape..... 30.92 119		
1.2.1 Competition intensity..... 75.20 43		
1.2.2 Ease of doing business..... 47.25 106		
1.2.3 Cluster development..... 37.41 80		
1.2.4 R&D expenditure..... 3.42 92		
1.2.5 ICT infrastructure..... 9.92 123		
1.2.6 Urban population..... 12.35 125		
1.3 Business and Labour Landscape..... 41.77 80		
Labour Market		
1.3.1 Tertiary-educated unemployment..... 82.87 55		
1.3.2 Active labour market policies..... 19.99 111		
1.3.3 Labour-employer cooperation..... 39.66 61		
Management Practice		
1.3.4 Professional management..... 42.17 84		
1.3.5 Relationship of pay to productivity..... 36.42 101		
Technology Adoption		
1.3.6 Technology utilisation..... 35.29 109		
1.3.7 Investment in emerging technologies..... 36.03 74		
1.3.8 Robot density..... n/a n/a		
2 ATTRACT..... 46.92 76		
2.1 External Openness..... 50.27 40		
Attract Business		
2.1.1 FDI and technology transfer..... 51.76 82		
2.1.2 Prevalence of foreign ownership..... 72.23 36		
Attract People		
2.1.3 Migrant stock..... 47.34 51		
2.1.4 International students..... 39.36 18		
2.1.5 Brain gain..... 40.63 79		
2.2 Internal Openness..... 43.58 113		
Social Inclusion		
2.2.1 Tolerance of minorities..... 18.89 109		
2.2.2 Tolerance of immigrants..... 35.62 102		
2.2.3 Social mobility..... 59.79 55		
Gender Equality		
2.2.4 Female graduates..... n/a n/a		
2.2.5 Gender development gap..... 40.76 120		
2.2.6 Leadership opportunities for women..... 62.83 35		

GDP per capita (PPP US\$)	2,033.29
GDP (US\$ billions)	27.48
GTCI score.....	28.47
GTCI score (income group average)	26.01

	Score	Rank
3 GROW..... 26.12 114		
3.1 Formal Education..... 3.10 129		
Enrolment		
3.1.1 Vocational enrolment..... n/a n/a		
3.1.2 Tertiary enrolment..... 3.06 122		
Quality		
3.1.3 Tertiary education expenditure..... 6.24 105		
3.1.4 Reading, maths, and science..... n/a n/a		
3.1.5 University ranking..... 0.00 75		
3.2 Lifelong Learning..... 36.65 88		
3.2.1 Quality of management schools..... 35.76 103		
3.2.2 Prevalence of training in firms..... 41.29 41		
3.2.3 Employee development..... 32.91 82		
3.3 Access to Growth Opportunities..... 38.60 104		
Empowerment		
3.3.1 Delegation of authority..... 46.17 65		
3.3.2 Personal rights..... 49.70 101		
Collaboration		
3.3.3 Use of virtual social networks..... 50.32 114		
3.3.4 Use of virtual professional networks..... 1.48 108		
3.3.5 Collaboration within organisations..... 50.70 53		
3.3.6 Collaboration across organisations..... 33.24 84		

4 RETAIN..... 21.41 122		
4.1 Sustainability..... 25.26 110		
4.1.1 Pension system..... n/a n/a		
4.1.2 Social protection..... 21.83 114		
4.1.3 Brain retention..... 28.69 100		
4.2 Lifestyle..... 17.57 128		
4.2.1 Environmental performance..... 28.09 111		
4.2.2 Personal safety..... 28.00 113		
4.2.3 Physician density..... 1.19 114		
4.2.4 Sanitation..... 12.99 128		

5 VOCATIONAL AND TECHNICAL SKILLS..... 27.84 113		
5.1 Mid-Level Skills..... 13.03 116		
5.1.1 Workforce with secondary education..... 36.49 79		
5.1.2 Population with secondary education..... 1.06 113		
5.1.3 Technicians and associate professionals..... 11.77 108		
5.1.4 Labour productivity per employee..... 2.80 102		
5.2 Employability..... 42.66 85		
5.2.1 Ease of finding skilled employees..... 68.64 38		
5.2.2 Relevance of education system to the economy..... 40.82 76		
5.2.3 Skills matching with secondary education..... 15.94 127		
5.2.4 Skills matching with tertiary education..... 45.22 93		

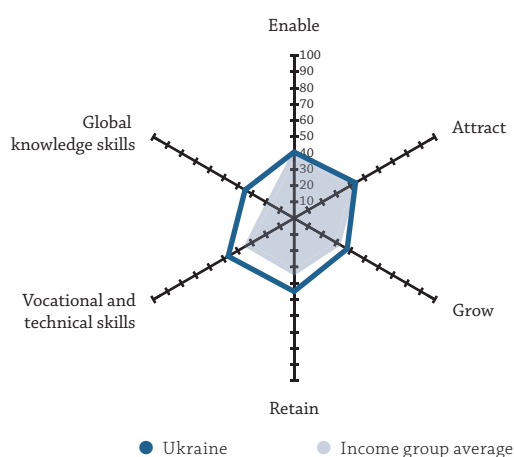
6 GLOBAL KNOWLEDGE SKILLS..... 11.66 111		
6.1 High-Level Skills..... 16.56 107		
6.1.1 Workforce with tertiary education..... 13.20 98		
6.1.2 Population with tertiary education..... 11.59 89		
6.1.3 Professionals..... 14.74 97		
6.1.4 Researchers..... 0.19 104		
6.1.5 Senior officials and managers..... 6.06 106		
6.1.6 Availability of scientists and engineers..... 53.56 55		
6.2 Talent Impact..... 6.76 119		
6.2.1 Innovation output..... 15.94 104		
6.2.2 High-value exports..... 5.32 102		
6.2.3 New product entrepreneurial activity..... 8.70 88		
6.2.4 New business density..... 3.32 78		
6.2.5 Scientific journal articles..... 0.53 106		

UKRAINE

Key Indicators

Rank (out of 132).....	66
Income group.....	Lower-middle income
Regional group.....	Europe
Population (millions).....	44.62

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	40.72	94
1.1 Regulatory Landscape.....	31.91	115
1.1.1 Government effectiveness.....	35.39	96
1.1.2 Rule of law.....	36.05	109
1.1.3 Political stability.....	23.61	126
1.1.4 Regulatory quality.....	40.20	93
1.1.5 Corruption.....	24.32	100
1.2 Market Landscape.....	48.89	70
1.2.1 Competition intensity.....	61.78	82
1.2.2 Ease of doing business.....	67.24	66
1.2.3 Cluster development.....	27.43	101
1.2.4 R&D expenditure.....	9.51	67
1.2.5 ICT infrastructure.....	62.60	61
1.2.6 Urban population.....	64.76	54
1.3 Business and Labour Landscape.....	41.36	81
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	74.65	85
1.3.2 Active labour market policies.....	48.54	57
1.3.3 Labour-employer cooperation.....	35.50	76
1.3.4 Management Practice		
1.3.4 Professional management.....	32.13	106
1.3.5 Relationship of pay to productivity.....	56.49	51
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	42.28	91
1.3.7 Investment in emerging technologies.....	40.56	60
1.3.8 Robot density.....	0.74	55
2 ATTRACT.....	43.64	93
2.1 External Openness.....	34.01	98
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	36.29	119
2.1.2 Prevalence of foreign ownership.....	33.75	119
2.1.3 Attract People		
2.1.3 Migrant stock.....	58.65	36
2.1.4 International students.....	11.53	57
2.1.5 Brain gain.....	29.84	100
2.2 Internal Openness.....	53.27	84
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	43.33	69
2.2.2 Tolerance of immigrants.....	28.77	109
2.2.3 Social mobility.....	39.56	121
2.2.4 Gender Equality		
2.2.4 Female graduates.....	63.48	78
2.2.5 Gender development gap.....	86.42	23
2.2.6 Leadership opportunities for women.....	58.09	44

GDP per capita (PPP US\$).....	9,233.15
GDP (US\$ billions).....	130.83
GTCI score.....	41.47
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....	37.70	68
3.1 Formal Education.....	33.83	48
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	11.80	80
3.1.2 Tertiary enrolment.....	65.80	13
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	36.20	21
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	21.53	49
3.2 Lifelong Learning.....	36.78	87
3.2.1 Quality of management schools.....	48.94	62
3.2.2 Prevalence of training in firms.....	25.33	72
3.2.3 Employee development.....	36.06	72
3.3 Access to Growth Opportunities.....	42.50	87
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	35.84	93
3.3.2 Personal rights.....	60.05	88
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	59.73	101
3.3.4 Use of virtual professional networks.....	4.57	88
3.3.5 Collaboration within organisations.....	53.22	44
3.3.6 Collaboration across organisations.....	41.62	57

4 RETAIN.....	45.07	73
4.1 Sustainability.....	34.48	87
4.1.1 Pension system.....	47.06	57
4.1.2 Social protection.....	37.24	80
4.1.3 Brain retention.....	19.14	118
4.2 Lifestyle.....	55.67	66
4.2.1 Environmental performance.....	42.41	89
4.2.2 Personal safety.....	36.83	98
4.2.3 Physician density.....	47.80	37
4.2.4 Sanitation.....	95.63	50

5 VOCATIONAL AND TECHNICAL SKILLS.....	46.82	56
5.1 Mid-Level Skills.....	40.65	63
5.1.1 Workforce with secondary education.....	60.15	37
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	48.56	46
5.1.4 Labour productivity per employee.....	13.23	80
5.2 Employability.....	53.00	52
5.2.1 Ease of finding skilled employees.....	62.54	50
5.2.2 Relevance of education system to the economy.....	47.98	58
5.2.3 Skills matching with secondary education.....	45.92	57
5.2.4 Skills matching with tertiary education.....	55.56	64

6 GLOBAL KNOWLEDGE SKILLS.....	34.83	46
6.1 High-Level Skills.....	50.36	26
6.1.1 Workforce with tertiary education.....	80.84	3
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	48.10	29
6.1.4 Researchers.....	11.94	50
6.1.5 Senior officials and managers.....	49.40	25
6.1.6 Availability of scientists and engineers.....	61.54	41
6.2 Talent Impact.....	19.30	73
6.2.1 Innovation output.....	48.51	35
6.2.2 High-value exports.....	14.82	72
6.2.3 New product entrepreneurial activity.....	n/a	n/a
6.2.4 New business density.....	7.39	60
6.2.5 Scientific journal articles.....	6.46	62

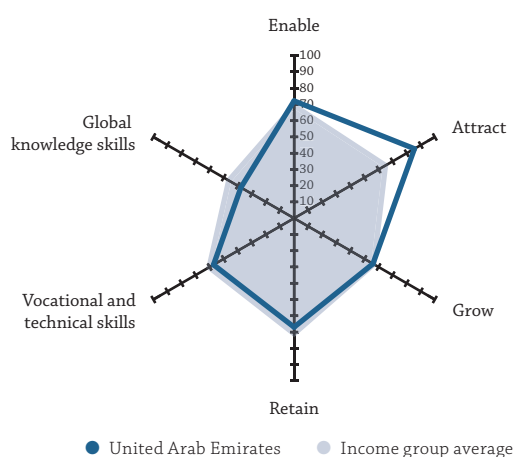
UNITED ARAB EMIRATES

Key Indicators

Rank (out of 132).....	22
Income group	High income
Regional group	Northern Africa and Western Asia
Population (millions)	9.63

GDP per capita (PPP US\$)	74,942.72
GDP (US\$ billions)	414.18
GTCI score	62.63
GTCI score (income group average)	61.46

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	72.20	22
1.1 Regulatory Landscape.....	75.83	23
1.1.1 Government effectiveness	80.43	18
1.1.2 Rule of law	71.29	33
1.1.3 Political stability.....	78.79	34
1.1.4 Regulatory quality.....	72.95	31
1.1.5 Corruption	75.68	22
1.2 Market Landscape.....	72.34	20
1.2.1 Competition intensity.....	73.58	46
1.2.2 Ease of doing business.....	90.51	10
1.2.3 Cluster development.....	82.83	9
1.2.4 R&D expenditure.....	20.81	36
1.2.5 ICT infrastructure.....	81.81	22
1.2.6 Urban population.....	84.50	21
1.3 Business and Labour Landscape.....	68.43	22
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment	89.13	29
1.3.2 Active labour market policies	70.86	26
1.3.3 Labour-employer cooperation	67.80	16
1.3.4 Management Practice		
1.3.4 Professional management	75.54	24
1.3.5 Relationship of pay to productivity.....	84.76	6
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	78.92	18
1.3.7 Investment in emerging technologies	79.57	11
1.3.8 Robot density.....	0.90	54
2 ATTRACT.....	85.51	3
2.1 External Openness	89.96	3
2.1.1 Attract Business		
2.1.1 FDI and technology transfer	81.39	15
2.1.2 Prevalence of foreign ownership.....	77.04	26
2.1.3 Attract People		
2.1.3 Migrant stock	100.00	1
2.1.4 International students.....	100.00	1
2.1.5 Brain gain	91.35	6
2.2 Internal Openness	81.07	9
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	80.00	11
2.2.2 Tolerance of immigrants	95.89	4
2.2.3 Social mobility	82.82	15
2.2.4 Gender Equality		
2.2.4 Female graduates	68.14	73
2.2.5 Gender development gap	77.56	66
2.2.6 Leadership opportunities for women	81.98	9

	Score	Rank
3 GROW.....	56.03	24
3.1 Formal Education.....	26.73	64
3.1.1 Enrolment		
3.1.1 Vocational enrolment	2.87	108
3.1.2 Tertiary enrolment	n/a	n/a
3.1.3 Quality		
3.1.3 Tertiary education expenditure	n/a	n/a
3.1.4 Reading, maths, and science	44.01	46
3.1.5 University ranking.....	33.30	36
3.2 Lifelong Learning.....	70.98	21
3.2.1 Quality of management schools	71.87	24
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development	70.09	19
3.3 Access to Growth Opportunities	70.39	20
3.3.1 Empowerment		
3.3.1 Delegation of authority	71.65	23
3.3.2 Personal rights	31.40	114
3.3.3 Collaboration		
3.3.3 Use of virtual social networks	79.00	54
3.3.4 Use of virtual professional networks	100.00	1
3.3.5 Collaboration within organisations.....	70.66	25
3.3.6 Collaboration across organisations.....	69.61	12

4 RETAIN.....	67.02	29
4.1 Sustainability	76.82	19
4.1.1 Pension system	n/a	n/a
4.1.2 Social protection.....	62.57	34
4.1.3 Brain retention	91.08	3
4.2 Lifestyle	57.21	58
4.2.1 Environmental performance	52.46	66
4.2.2 Personal safety	51.73	69
4.2.3 Physician density.....	24.68	72
4.2.4 Sanitation	99.98	10

5 VOCATIONAL AND TECHNICAL SKILLS.....	57.24	31
5.1 Mid-Level Skills	38.57	66
5.1.1 Workforce with secondary education	21.27	104
5.1.2 Population with secondary education	24.72	84
5.1.3 Technicians and associate professionals.....	44.19	49
5.1.4 Labour productivity per employee.....	64.11	10
5.2 Employability.....	75.90	16
5.2.1 Ease of finding skilled employees	82.28	9
5.2.2 Relevance of education system to the economy	73.82	13
5.2.3 Skills matching with secondary education	70.50	14
5.2.4 Skills matching with tertiary education.....	77.01	22

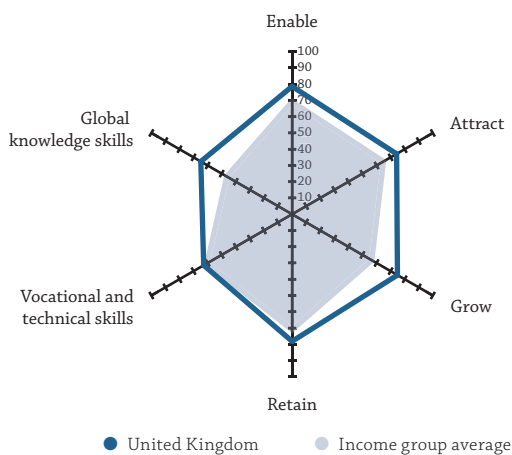
6 GLOBAL KNOWLEDGE SKILLS	37.79	38
6.1 High-Level Skills	51.64	24
6.1.1 Workforce with tertiary education	55.08	24
6.1.2 Population with tertiary education.....	55.50	17
6.1.3 Professionals	35.27	49
6.1.4 Researchers	29.08	34
6.1.5 Senior officials and managers	54.03	21
6.1.6 Availability of scientists and engineers.....	80.89	9
6.2 Talent Impact.....	23.94	61
6.2.1 Innovation output	35.55	57
6.2.2 High-value exports.....	6.90	93
6.2.3 New product entrepreneurial activity.....	55.46	34
6.2.4 New business density	12.60	41
6.2.5 Scientific journal articles	9.20	54

UNITED KINGDOM

Key Indicators

Rank (out of 132).....	12
Income group.....	High income
Regional group.....	Europe
Population (millions).....	66.49

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 78.65 15		
1.1 Regulatory Landscape.....	84.57	16
1.1.1 Government effectiveness.....	80.82	17
1.1.2 Rule of law.....	91.88	13
1.1.3 Political stability.....	70.79	52
1.1.4 Regulatory quality.....	90.17	11
1.1.5 Corruption.....	89.19	11
1.2 Market Landscape.....	79.39	11
1.2.1 Competition intensity.....	87.81	8
1.2.2 Ease of doing business.....	92.96	8
1.2.3 Cluster development.....	83.26	8
1.2.4 R&D expenditure.....	36.37	21
1.2.5 ICT infrastructure.....	95.04	3
1.2.6 Urban population.....	80.91	26
1.3 Business and Labour Landscape.....	72.00	17
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....	91.84	19
1.3.2 Active labour market policies.....	63.15	34
1.3.3 Labour-employer cooperation.....	63.64	27
1.3.4 Management Practice		
1.3.4 Professional management.....	89.28	12
1.3.5 Relationship of pay to productivity.....	74.58	13
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....	84.12	13
1.3.7 Investment in emerging technologies.....	82.43	8
1.3.8 Robot density.....	26.94	21
2 ATTRACT..... 74.26 12		
2.1 External Openness.....	80.76	6
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....	87.19	6
2.1.2 Prevalence of foreign ownership.....	95.35	4
2.1.3 Attract People		
2.1.3 Migrant stock.....	61.64	29
2.1.4 International students.....	66.43	6
2.1.5 Brain gain.....	93.19	4
2.2 Internal Openness.....	67.76	31
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....	40.00	78
2.2.2 Tolerance of immigrants.....	84.93	16
2.2.3 Social mobility.....	73.14	28
2.2.4 Gender Equality		
2.2.4 Female graduates.....	73.39	61
2.2.5 Gender development gap.....	74.76	78
2.2.6 Leadership opportunities for women.....	60.33	41

GDP per capita (PPP US\$).....	46,239.71
GDP (US\$ billions).....	2,825.21
GTCI score.....	72.27
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW..... 74.86 5		
3.1 Formal Education.....	64.28	4
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....	70.64	3
3.1.2 Tertiary enrolment.....	46.68	46
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....	31.37	29
3.1.4 Reading, maths, and science.....	75.67	20
3.1.5 University ranking.....	97.03	2
3.2 Lifelong Learning.....	78.42	9
3.2.1 Quality of management schools.....	89.46	4
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development.....	67.38	22
3.3 Access to Growth Opportunities.....	81.88	5
3.3.1 Empowerment		
3.3.1 Delegation of authority.....	82.76	14
3.3.2 Personal rights.....	95.09	22
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....	97.47	4
3.3.4 Use of virtual professional networks.....	63.95	5
3.3.5 Collaboration within organisations.....	76.41	22
3.3.6 Collaboration across organisations.....	75.60	9

4 RETAIN..... 78.19 17		
4.1 Sustainability.....	79.57	15
4.1.1 Pension system.....	n/a	n/a
4.1.2 Social protection.....	74.19	22
4.1.3 Brain retention.....	84.95	7
4.2 Lifestyle.....	76.82	21
4.2.1 Environmental performance.....	87.45	6
4.2.2 Personal safety.....	75.77	27
4.2.3 Physician density.....	45.00	41
4.2.4 Sanitation.....	99.05	30

5 VOCATIONAL AND TECHNICAL SKILLS..... 62.80 24		
5.1 Mid-Level Skills.....	53.07	41
5.1.1 Workforce with secondary education.....	53.93	48
5.1.2 Population with secondary education.....	49.82	44
5.1.3 Technicians and associate professionals.....	54.81	35
5.1.4 Labour productivity per employee.....	53.73	25
5.2 Employability.....	72.53	19
5.2.1 Ease of finding skilled employees.....	83.63	8
5.2.2 Relevance of education system to the economy.....	68.53	19
5.2.3 Skills matching with secondary education.....	61.04	30
5.2.4 Skills matching with tertiary education.....	76.91	23

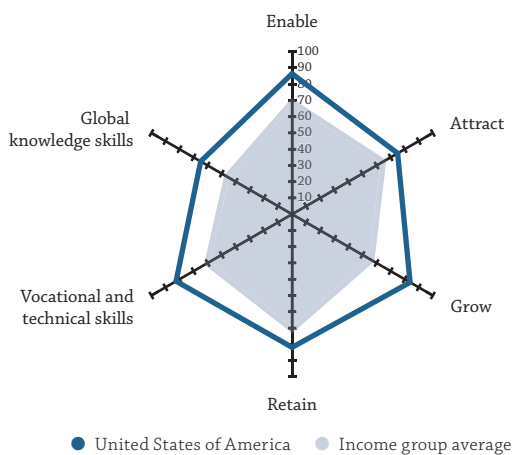
6 GLOBAL KNOWLEDGE SKILLS..... 64.87 3		
6.1 High-Level Skills.....	65.55	8
6.1.1 Workforce with tertiary education.....	64.85	15
6.1.2 Population with tertiary education.....	62.27	10
6.1.3 Professionals.....	66.41	9
6.1.4 Researchers.....	52.99	19
6.1.5 Senior officials and managers.....	70.05	7
6.1.6 Availability of scientists and engineers.....	76.74	14
6.2 Talent Impact.....	64.19	4
6.2.1 Innovation output.....	84.06	4
6.2.2 High-value exports.....	61.67	12
6.2.3 New product entrepreneurial activity.....	40.52	55
6.2.4 New business density.....	75.81	5
6.2.5 Scientific journal articles.....	58.91	14

UNITED STATES OF AMERICA

Key Indicators

Rank (out of 132).....	2
Income group	High income
Regional group	Northern America
Population (millions)	327.17

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 86.46	3	
1.1 Regulatory Landscape.....	82.41	18
1.1.1 Government effectiveness	84.22	13
1.1.2 Rule of law	91.07	14
1.1.3 Political stability.....	71.70	48
1.1.4 Regulatory quality.....	88.05	14
1.1.5 Corruption	77.03	21
1.2 Market Landscape.....	85.49	3
1.2.1 Competition intensity.....	95.25	2
1.2.2 Ease of doing business.....	93.14	7
1.2.3 Cluster development.....	100.00	1
1.2.4 R&D expenditure.....	61.10	9
1.2.5 ICT infrastructure.....	83.84	16
1.2.6 Urban population.....	79.60	27
1.3 Business and Labour Landscape.....	91.46	2
Labour Market		
1.3.1 Tertiary-educated unemployment	92.04	16
1.3.2 Active labour market policies	98.20	2
1.3.3 Labour-employer cooperation	85.86	6
Management Practice		
1.3.4 Professional management	91.54	11
1.3.5 Relationship of pay to productivity.....	100.00	1
Technology Adoption		
1.3.6 Technology utilisation.....	100.00	1
1.3.7 Investment in emerging technologies	100.00	1
1.3.8 Robot density.....	64.06	7
2 ATTRACT..... 74.98	11	
2.1 External Openness	71.84	10
Attract Business		
2.1.1 FDI and technology transfer	95.43	3
2.1.2 Prevalence of foreign ownership.....	83.50	12
Attract People		
2.1.3 Migrant stock	67.11	19
2.1.4 International students.....	18.42	37
2.1.5 Brain gain	94.77	2
2.2 Internal Openness.....	78.11	14
Social Inclusion		
2.2.1 Tolerance of minorities.....	43.33	69
2.2.2 Tolerance of immigrants	83.56	20
2.2.3 Social mobility	90.74	9
Gender Equality		
2.2.4 Female graduates	76.41	50
2.2.5 Gender development gap	86.07	25
2.2.6 Leadership opportunities for women	88.53	5

GDP per capita (PPP US\$)	62,641.01
GDP (US\$ billions)	20,494.10
GTGI score.....	79.09
GTGI score (income group average)	61.46

	Score	Rank
3 GROW..... 83.83	1	
3.1 Formal Education.....	68.06	2
Enrolment		
3.1.1 Vocational enrolment	n/a	n/a
3.1.2 Tertiary enrolment	70.11	8
Quality		
3.1.3 Tertiary education expenditure	32.23	27
3.1.4 Reading, maths, and science	69.89	28
3.1.5 University ranking.....	100.00	1
3.2 Lifelong Learning.....	92.68	2
3.2.1 Quality of management schools	88.31	5
3.2.2 Prevalence of training in firms.....	n/a	n/a
3.2.3 Employee development	97.05	2
3.3 Access to Growth Opportunities	90.75	1
Empowerment		
3.3.1 Delegation of authority	88.39	7
3.3.2 Personal rights	91.53	31
Collaboration		
3.3.3 Use of virtual social networks	88.45	19
3.3.4 Use of virtual professional networks	79.20	2
3.3.5 Collaboration within organisations.....	96.93	2
3.3.6 Collaboration across organisations.....	100.00	1

4 RETAIN..... 81.90	12	
4.1 Sustainability	95.26	3
4.1.1 Pension system	100.00	1
4.1.2 Social protection.....	88.02	11
4.1.3 Brain retention	97.76	2
4.2 Lifestyle	68.53	36
4.2.1 Environmental performance	72.95	26
4.2.2 Personal safety	60.35	55
4.2.3 Physician density.....	40.88	46
4.2.4 Sanitation	99.97	12

5 VOCATIONAL AND TECHNICAL SKILLS..... 82.41	1	
5.1 Mid-Level Skills	67.05	8
5.1.1 Workforce with secondary education	65.43	31
5.1.2 Population with secondary education	63.94	27
5.1.3 Technicians and associate professionals.....	61.88	23
5.1.4 Labour productivity per employee.....	76.94	7
5.2 Employability.....	97.77	1
5.2.1 Ease of finding skilled employees	100.00	1
5.2.2 Relevance of education system to the economy	96.93	2
5.2.3 Skills matching with secondary education	97.06	2
5.2.4 Skills matching with tertiary education.....	97.08	2

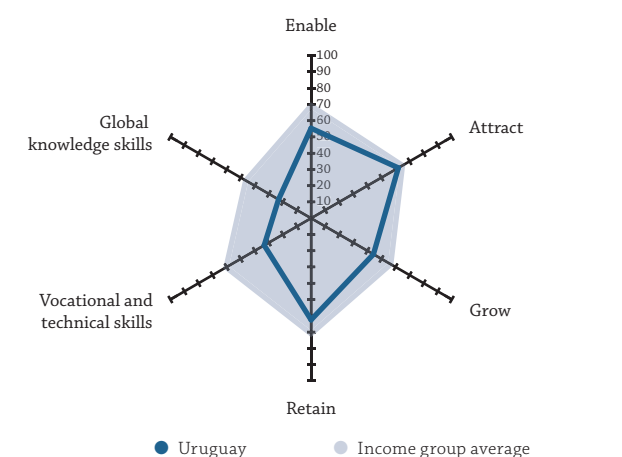
6 GLOBAL KNOWLEDGE SKILLS..... 64.96	2	
6.1 High-Level Skills	69.75	3
6.1.1 Workforce with tertiary education	72.02	6
6.1.2 Population with tertiary education.....	69.72	7
6.1.3 Professionals	58.69	15
6.1.4 Researchers	51.53	22
6.1.5 Senior officials and managers	66.54	10
6.1.6 Availability of scientists and engineers.....	100.00	1
6.2 Talent Impact.....	60.17	10
6.2.1 Innovation output	80.91	6
6.2.2 High-value exports.....	41.15	23
6.2.3 New product entrepreneurial activity.....	68.46	12
6.2.4 New business density	n/a	n/a
6.2.5 Scientific journal articles	50.15	21

URUGUAY

Key Indicators

Rank (out of 132).....	51
Income group.....	High income
Regional group.....	Latin America and the Caribbean
Population (millions).....	3.45

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....55.35 46		
1.1 Regulatory Landscape.....70.24 33		
1.1.1 Government effectiveness.....56.62 48		
1.1.2 Rule of law.....66.34 38		
1.1.3 Political stability.....88.36 14		
1.1.4 Regulatory quality.....64.22 40		
1.1.5 Corruption.....75.68 22		
1.2 Market Landscape.....52.60 62		
1.2.1 Competition intensity.....56.98 100		
1.2.2 Ease of doing business.....57.15 84		
1.2.3 Cluster development.....26.93 104		
1.2.4 R&D expenditure.....8.63 69		
1.2.5 ICT infrastructure.....71.25 42		
1.2.6 Urban population.....94.63 5		
1.3 Business and Labour Landscape.....43.20 74		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment.....90.18 24		
1.3.2 Active labour market policies.....53.31 49		
1.3.3 Labour-employer cooperation.....2.61 130		
1.3.4 Management Practice		
1.3.4 Professional management.....49.78 64		
1.3.5 Relationship of pay to productivity.....31.46 116		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation.....48.11 71		
1.3.7 Investment in emerging technologies.....26.97 103		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....61.98 30		
2.1 External Openness.....48.51 50		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer.....67.48 43		
2.1.2 Prevalence of foreign ownership.....68.71 44		
2.1.3 Attract People		
2.1.3 Migrant stock.....27.64 88		
2.1.4 International students.....n/a n/a		
2.1.5 Brain gain.....30.22 97		
2.2 Internal Openness.....75.45 18		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities.....86.67 7		
2.2.2 Tolerance of immigrants.....79.45 25		
2.2.3 Social mobility.....64.20 43		
2.2.4 Gender Equality		
2.2.4 Female graduates.....90.92 14		
2.2.5 Gender development gap.....93.77 7		
2.2.6 Leadership opportunities for women.....37.68 88		

GDP per capita (PPP US\$).....	23,530.61
GDP (US\$ billions).....	59.60
GTCI score.....	46.76
GTCI score (income group average).....	61.46

	Score	Rank
3 GROW.....44.30 46		
3.1 Formal Education.....34.26 47		
3.1.1 Enrolment		
3.1.1 Vocational enrolment.....34.39 30		
3.1.2 Tertiary enrolment.....49.02 42		
3.1.3 Quality		
3.1.3 Tertiary education expenditure.....26.94 43		
3.1.4 Reading, maths, and science.....42.78 47		
3.1.5 University ranking.....18.18 53		
3.2 Lifelong Learning.....50.05 49		
3.2.1 Quality of management schools.....53.03 51		
3.2.2 Prevalence of training in firms.....65.83 17		
3.2.3 Employee development.....31.30 89		
3.3 Access to Growth Opportunities.....48.58 59		
3.3.1 Empowerment		
3.3.1 Delegation of authority.....38.70 87		
3.3.2 Personal rights.....96.21 16		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks.....76.35 59		
3.3.4 Use of virtual professional networks.....20.17 32		
3.3.5 Collaboration within organisations.....31.86 112		
3.3.6 Collaboration across organisations.....28.18 98		

4 RETAIN.....62.51 37		
4.1 Sustainability.....59.02 37		
4.1.1 Pension system.....70.80 37		
4.1.2 Social protection.....75.21 20		
4.1.3 Brain retention.....31.04 94		
4.2 Lifestyle.....65.99 42		
4.2.1 Environmental performance.....62.04 42		
4.2.2 Personal safety.....46.98 82		
4.2.3 Physician density.....59.61 17		
4.2.4 Sanitation.....95.35 52		

5 VOCATIONAL AND TECHNICAL SKILLS.....33.32 96		
5.1 Mid-Level Skills.....24.21 95		
5.1.1 Workforce with secondary education.....13.84 112		
5.1.2 Population with secondary education.....22.78 93		
5.1.3 Technicians and associate professionals.....31.85 70		
5.1.4 Labour productivity per employee.....28.39 55		
5.2 Employability.....42.43 86		
5.2.1 Ease of finding skilled employees.....51.39 78		
5.2.2 Relevance of education system to the economy.....19.67 125		
5.2.3 Skills matching with secondary education.....31.59 98		
5.2.4 Skills matching with tertiary education.....67.06 35		

6 GLOBAL KNOWLEDGE SKILLS.....23.13 75		
6.1 High-Level Skills.....21.62 87		
6.1.1 Workforce with tertiary education.....20.82 84		
6.1.2 Population with tertiary education.....19.84 73		
6.1.3 Professionals.....31.33 56		
6.1.4 Researchers.....7.97 61		
6.1.5 Senior officials and managers.....13.99 81		
6.1.6 Availability of scientists and engineers.....35.75 103		
6.2 Talent Impact.....24.64 57		
6.2.1 Innovation output.....33.10 60		
6.2.2 High-value exports.....22.10 54		
6.2.3 New product entrepreneurial activity.....48.77 43		
6.2.4 New business density.....9.91 49		
6.2.5 Scientific journal articles.....9.33 53		

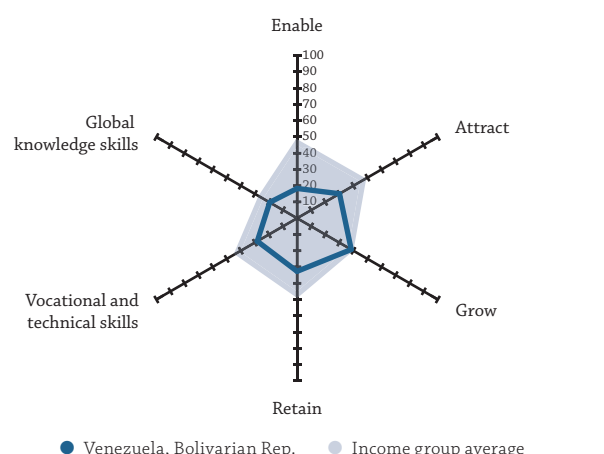
VENEZUELA, BOLIVARIAN REP.

Key Indicators

Rank (out of 132).....	114
Income group.....	Upper-middle income
Regional group.....	Latin America and the Caribbean
Population (millions).....	28.87

GDP per capita (PPP US\$).....	18,102.47
GDP (US\$ billions).....	482.36
GTCI score.....	27.89
GTCI score (income group average).....	41.25

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....	18.32	130
1.1 Regulatory Landscape.....	11.43	130
1.1.1 Government effectiveness.....	12.63	130
1.1.2 Rule of law.....	0.00	132
1.1.3 Political stability.....	39.11	120
1.1.4 Regulatory quality.....	0.00	132
1.1.5 Corruption.....	5.41	130
1.2 Market Landscape.....	22.90	127
1.2.1 Competition intensity.....	0.00	132
1.2.2 Ease of doing business.....	0.00	132
1.2.3 Cluster development.....	4.54	131
1.2.4 R&D expenditure.....	2.28	103
1.2.5 ICT infrastructure.....	44.15	79
1.2.6 Urban population.....	86.44	15
1.3 Business and Labour Landscape.....	20.63	129
Labour Market		
1.3.1 Tertiary-educated unemployment.....	73.84	87
1.3.2 Active labour market policies.....	4.02	128
1.3.3 Labour-employer cooperation.....	10.85	122
Management Practice		
1.3.4 Professional management.....	45.72	75
1.3.5 Relationship of pay to productivity.....	0.00	132
Technology Adoption		
1.3.6 Technology utilisation.....	19.85	123
1.3.7 Investment in emerging technologies.....	10.78	129
1.3.8 Robot density.....	0.03	67
2 ATTRACT.....	30.15	129
2.1 External Openness.....	15.30	131
Attract Business		
2.1.1 FDI and technology transfer.....	9.64	131
2.1.2 Prevalence of foreign ownership.....	23.01	128
Attract People		
2.1.3 Migrant stock.....	43.62	59
2.1.4 International students.....	0.23	109
2.1.5 Brain gain.....	0.00	132
2.2 Internal Openness.....	44.99	110
Social Inclusion		
2.2.1 Tolerance of minorities.....	26.67	97
2.2.2 Tolerance of immigrants.....	58.90	65
2.2.3 Social mobility.....	0.00	132
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	92.80	10
2.2.6 Leadership opportunities for women.....	46.60	63

	Score	Rank
3 GROW.....	38.46	66
3.1 Formal Education.....	29.67	55
Enrolment		
3.1.1 Vocational enrolment.....	8.29	87
3.1.2 Tertiary enrolment.....	60.68	21
Quality		
3.1.3 Tertiary education expenditure.....	36.88	19
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	12.82	64
3.2 Lifelong Learning.....	46.85	56
3.2.1 Quality of management schools.....	46.64	68
3.2.2 Prevalence of training in firms.....	69.39	11
3.2.3 Employee development.....	24.51	113
3.3 Access to Growth Opportunities.....	38.86	103
Empowerment		
3.3.1 Delegation of authority.....	43.14	73
3.3.2 Personal rights.....	32.99	113
Collaboration		
3.3.3 Use of virtual social networks.....	69.77	81
3.3.4 Use of virtual professional networks.....	12.26	52
3.3.5 Collaboration within organisations.....	44.23	82
3.3.6 Collaboration across organisations.....	30.74	88

4 RETAIN.....	32.68	101
4.1 Sustainability.....	13.47	129
4.1.1 Pension system.....	33.90	64
4.1.2 Social protection.....	6.51	130
4.1.3 Brain retention.....	0.00	132
4.2 Lifestyle.....	51.88	71
4.2.1 Environmental performance.....	60.78	46
4.2.2 Personal safety.....	0.32	130
4.2.3 Physician density.....	n/a	n/a
4.2.4 Sanitation.....	94.55	55

5 VOCATIONAL AND TECHNICAL SKILLS.....	28.29	111
5.1 Mid-Level Skills.....	21.98	98
5.1.1 Workforce with secondary education.....	16.40	110
5.1.2 Population with secondary education.....	38.18	64
5.1.3 Technicians and associate professionals.....	n/a	n/a
5.1.4 Labour productivity per employee.....	11.36	82
5.2 Employability.....	34.59	110
5.2.1 Ease of finding skilled employees.....	31.69	126
5.2.2 Relevance of education system to the economy.....	22.45	116
5.2.3 Skills matching with secondary education.....	29.99	104
5.2.4 Skills matching with tertiary education.....	54.22	68

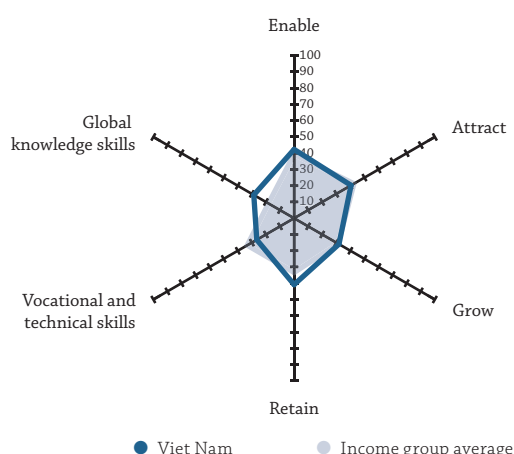
6 GLOBAL KNOWLEDGE SKILLS.....	19.48	83
6.1 High-Level Skills.....	30.15	62
6.1.1 Workforce with tertiary education.....	44.71	39
6.1.2 Population with tertiary education.....	54.56	20
6.1.3 Professionals.....	39.04	43
6.1.4 Researchers.....	3.32	74
6.1.5 Senior officials and managers.....	24.48	61
6.1.6 Availability of scientists and engineers.....	14.79	130
6.2 Talent Impact.....	8.82	108
6.2.1 Innovation output.....	n/a	n/a
6.2.2 High-value exports.....	3.36	107
6.2.3 New product entrepreneurial activity.....	22.00	79
6.2.4 New business density.....	n/a	n/a
6.2.5 Scientific journal articles.....	1.10	93

VIET NAM

Key Indicators

Rank (out of 132).....	96
Income group.....	Lower-middle income
Regional group.....	Eastern, Southeastern Asia and Oceania
Population (millions).....	95.54

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE..... 42.35 90		
1.1 Regulatory Landscape..... 47.32 74		
1.1.1 Government effectiveness..... 46.60 72		
1.1.2 Rule of law..... 54.29 60		
1.1.3 Political stability..... 71.71 47		
1.1.4 Regulatory quality..... 38.31 98		
1.1.5 Corruption..... 25.68 97		
1.2 Market Landscape..... 40.82 92		
1.2.1 Competition intensity..... 59.74 89		
1.2.2 Ease of doing business..... 67.43 64		
1.2.3 Cluster development..... 41.14 72		
1.2.4 R&D expenditure..... 11.22 61		
1.2.5 ICT infrastructure..... 39.06 88		
1.2.6 Urban population..... 26.32 115		
1.3 Business and Labour Landscape..... 38.91 87		
1.3.1 Labour Market		
1.3.1 Tertiary-educated unemployment..... 86.70 43		
1.3.2 Active labour market policies..... 35.20 75		
1.3.3 Labour-employer cooperation..... 32.17 88		
1.3.4 Management Practice		
1.3.4 Professional management..... 26.84 120		
1.3.5 Relationship of pay to productivity..... 49.42 63		
1.3.6 Technology Adoption		
1.3.6 Technology utilisation..... 38.03 102		
1.3.7 Investment in emerging technologies..... 38.57 65		
1.3.8 Robot density..... 4.36 41		
2 ATTRACT..... 40.47 105		
2.1 External Openness..... 26.73 117		
2.1.1 Attract Business		
2.1.1 FDI and technology transfer..... 48.29 91		
2.1.2 Prevalence of foreign ownership..... 43.77 103		
2.1.3 Attract People		
2.1.3 Migrant stock..... 0.60 131		
2.1.4 International students..... 0.79 103		
2.1.5 Brain gain..... 40.20 80		
2.2 Internal Openness..... 54.20 76		
2.2.1 Social Inclusion		
2.2.1 Tolerance of minorities..... 46.67 63		
2.2.2 Tolerance of immigrants..... 38.36 101		
2.2.3 Social mobility..... 47.83 94		
2.2.4 Gender Equality		
2.2.4 Female graduates..... 64.81 75		
2.2.5 Gender development gap..... 90.78 13		
2.2.6 Leadership opportunities for women..... 36.78 90		

GDP per capita (PPP US\$).....	7,434.68
GDP (US\$ billions).....	244.95
GTCI score.....	35.11
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW..... 31.88 89		
3.1 Formal Education..... 32.78 50		
3.1.1 Enrolment		
3.1.1 Vocational enrolment..... n/a n/a		
3.1.2 Tertiary enrolment..... 21.88 83		
3.1.3 Quality		
3.1.3 Tertiary education expenditure..... 18.67 71		
3.1.4 Reading, maths, and science..... 76.65 19		
3.1.5 University ranking..... 13.92 61		
3.2 Lifelong Learning..... 29.79 113		
3.2.1 Quality of management schools..... 30.02 114		
3.2.2 Prevalence of training in firms..... 24.80 73		
3.2.3 Employee development..... 34.54 78		
3.3 Access to Growth Opportunities..... 33.08 116		
3.3.1 Empowerment		
3.3.1 Delegation of authority..... 32.81 105		
3.3.2 Personal rights..... 35.14 112		
3.3.3 Collaboration		
3.3.3 Use of virtual social networks..... 67.34 87		
3.3.4 Use of virtual professional networks..... 1.00 112		
3.3.5 Collaboration within organisations..... 32.00 111		
3.3.6 Collaboration across organisations..... 30.20 89		

4 RETAIN..... 40.84 87		
4.1 Sustainability..... 35.03 85		
4.1.1 Pension system..... 23.50 78		
4.1.2 Social protection..... 43.22 66		
4.1.3 Brain retention..... 38.38 73		
4.2 Lifestyle..... 46.64 87		
4.2.1 Environmental performance..... 32.56 105		
4.2.2 Personal safety..... 64.56 42		
4.2.3 Physician density..... 12.86 88		
4.2.4 Sanitation..... 76.58 87		

5 VOCATIONAL AND TECHNICAL SKILLS..... 26.51 117		
5.1 Mid-Level Skills..... 18.12 107		
5.1.1 Workforce with secondary education..... 26.51 99		
5.1.2 Population with secondary education..... 25.83 80		
5.1.3 Technicians and associate professionals..... 13.44 107		
5.1.4 Labour productivity per employee..... 6.72 93		
5.2 Employability..... 34.90 109		
5.2.1 Ease of finding skilled employees..... 43.47 99		
5.2.2 Relevance of education system to the economy..... 37.44 85		
5.2.3 Skills matching with secondary education..... 25.83 113		
5.2.4 Skills matching with tertiary education..... 32.88 122		

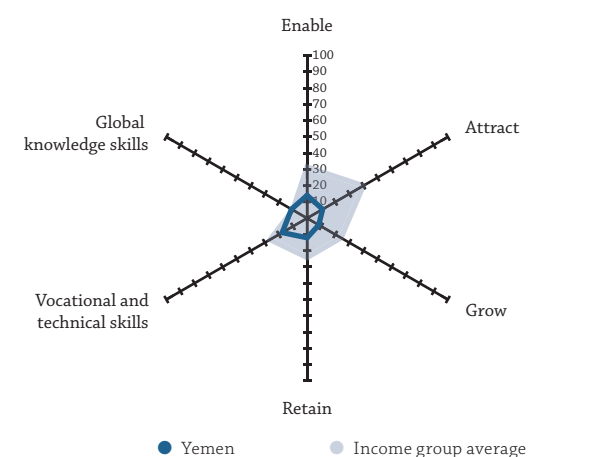
6 GLOBAL KNOWLEDGE SKILLS..... 28.63 59		
6.1 High-Level Skills..... 17.21 102		
6.1.1 Workforce with tertiary education..... 18.16 89		
6.1.2 Population with tertiary education..... 9.21 93		
6.1.3 Professionals..... 18.22 87		
6.1.4 Researchers..... 8.38 58		
6.1.5 Senior officials and managers..... 5.26 114		
6.1.6 Availability of scientists and engineers..... 44.06 76		
6.2 Talent Impact..... 40.04 32		
6.2.1 Innovation output..... 48.16 36		
6.2.2 High-value exports..... 87.82 5		
6.2.3 New product entrepreneurial activity..... 22.95 77		
6.2.4 New business density..... n/a n/a		
6.2.5 Scientific journal articles..... 1.21 91		

YEMEN

Key Indicators

Rank (out of 132).....	132
Income group	Low income
Regional group	Northern Africa and Western Asia
Population (millions)	28.50

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....14.08 132		
1.1 Regulatory Landscape.....4.84 132		
1.1.1 Government effectiveness.....0.00 132		
1.1.2 Rule of law.....11.73 131		
1.1.3 Political stability.....0.00 132		
1.1.4 Regulatory quality.....12.49 129		
1.1.5 Corruption.....0.00 132		
1.2 Market Landscape.....20.85 130		
1.2.1 Competition intensity.....38.32 128		
1.2.2 Ease of doing business.....3.22 131		
1.2.3 Cluster development.....14.71 126		
1.2.4 R&D expenditure.....n/a n/a		
1.2.5 ICT infrastructure.....n/a n/a		
1.2.6 Urban population.....27.15 111		
1.3 Business and Labour Landscape.....16.56 131		
Labour Market		
1.3.1 Tertiary-educated unemployment.....51.19 110		
1.3.2 Active labour market policies.....6.98 126		
1.3.3 Labour-employer cooperation.....19.75 111		
Management Practice		
1.3.4 Professional management.....3.30 131		
1.3.5 Relationship of pay to productivity.....26.86 122		
Technology Adoption		
1.3.6 Technology utilisation.....0.00 132		
1.3.7 Investment in emerging technologies.....7.80 130		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....11.02 132		
2.1 External Openness.....10.04 132		
Attract Business		
2.1.1 FDI and technology transfer.....0.00 132		
2.1.2 Prevalence of foreign ownership.....0.00 132		
Attract People		
2.1.3 Migrant stock.....24.78 92		
2.1.4 International students.....15.56 46		
2.1.5 Brain gain.....9.87 130		
2.2 Internal Openness.....11.99 132		
Social Inclusion		
2.2.1 Tolerance of minorities.....4.44 127		
2.2.2 Tolerance of immigrants.....24.66 113		
2.2.3 Social mobility.....30.87 127		
Gender Equality		
2.2.4 Female graduates.....n/a n/a		
2.2.5 Gender development gap.....0.00 130		
2.2.6 Leadership opportunities for women.....0.00 132		

GDP per capita (PPP US\$)	2,570.59
GDP (US\$ billions)	26.91
GTCI score.....	12.36
GTCI score (income group average)	26.01

	Score	Rank
3 GROW.....8.29 132		
3.1 Formal Education.....2.55 130		
Enrolment		
3.1.1 Vocational enrolment.....0.32 117		
3.1.2 Tertiary enrolment.....7.32 108		
Quality		
3.1.3 Tertiary education expenditure.....n/a n/a		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....8.95 132		
3.2.1 Quality of management schools.....12.47 130		
3.2.2 Prevalence of training in firms.....14.38 90		
3.2.3 Employee development.....0.00 132		
3.3 Access to Growth Opportunities.....13.36 132		
Empowerment		
3.3.1 Delegation of authority.....0.37 131		
3.3.2 Personal rights.....0.00 131		
Collaboration		
3.3.3 Use of virtual social networks.....47.02 116		
3.3.4 Use of virtual professional networks.....0.59 117		
3.3.5 Collaboration within organisations.....15.63 131		
3.3.6 Collaboration across organisations.....16.55 128		

4 RETAIN.....12.03 131		
4.1 Sustainability.....3.64 132		
4.1.1 Pension system.....5.20 104		
4.1.2 Social protection.....0.00 132		
4.1.3 Brain retention.....5.71 128		
4.2 Lifestyle.....20.43 124		
4.2.1 Environmental performance.....n/a n/a		
4.2.2 Personal safety.....0.00 131		
4.2.3 Physician density.....4.68 104		
4.2.4 Sanitation.....56.61 101		

5 VOCATIONAL AND TECHNICAL SKILLS.....17.66 130		
5.1 Mid-Level Skills.....16.79 110		
5.1.1 Workforce with secondary education.....30.21 88		
5.1.2 Population with secondary education.....n/a n/a		
5.1.3 Technicians and associate professionals.....14.34 105		
5.1.4 Labour productivity per employee.....5.81 97		
5.2 Employability.....18.53 131		
5.2.1 Ease of finding skilled employees.....35.59 114		
5.2.2 Relevance of education system to the economy.....14.27 129		
5.2.3 Skills matching with secondary education.....2.44 131		
5.2.4 Skills matching with tertiary education.....21.83 130		

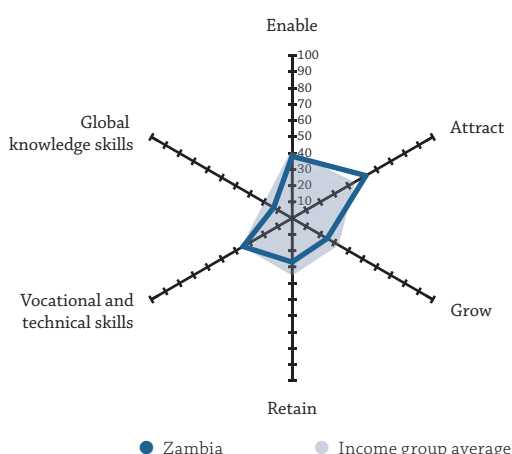
6 GLOBAL KNOWLEDGE SKILLS.....11.10 113		
6.1 High-Level Skills.....17.50 100		
6.1.1 Workforce with tertiary education.....11.15 103		
6.1.2 Population with tertiary education.....n/a n/a		
6.1.3 Professionals.....18.35 86		
6.1.4 Researchers.....n/a n/a		
6.1.5 Senior officials and managers.....8.36 100		
6.1.6 Availability of scientists and engineers.....32.13 111		
6.2 Talent Impact.....4.70 123		
6.2.1 Innovation output.....0.00 122		
6.2.2 High-value exports.....13.98 74		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....n/a n/a		
6.2.5 Scientific journal articles.....0.12 125		

ZAMBIA

Key Indicators

Rank (out of 132).....	103
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	17.35

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....38.12 100		
1.1 Regulatory Landscape.....	41.79	87
1.1.1 Government effectiveness.....	31.46	106
1.1.2 Rule of law.....	45.03	84
1.1.3 Political stability.....	67.44	61
1.1.4 Regulatory quality.....	36.65	103
1.1.5 Corruption.....	28.38	87
1.2 Market Landscape.....	36.37	103
1.2.1 Competition intensity.....	65.13	74
1.2.2 Ease of doing business.....	61.58	81
1.2.3 Cluster development.....	35.80	85
1.2.4 R&D expenditure.....	5.78	82
1.2.5 ICT infrastructure.....	14.89	116
1.2.6 Urban population.....	35.06	103
1.3 Business and Labour Landscape.....	36.21	101
Labour Market		
1.3.1 Tertiary-educated unemployment.....	76.89	75
1.3.2 Active labour market policies.....	16.82	113
1.3.3 Labour-employer cooperation.....	20.04	110
Management Practice		
1.3.4 Professional management.....	38.00	95
1.3.5 Relationship of pay to productivity.....	38.74	89
Technology Adoption		
1.3.6 Technology utilisation.....	31.59	110
1.3.7 Investment in emerging technologies.....	31.39	93
1.3.8 Robot density.....	n/a	n/a
2 ATTRACT.....52.44 54		
2.1 External Openness.....	49.52	44
Attract Business		
2.1.1 FDI and technology transfer.....	50.02	87
2.1.2 Prevalence of foreign ownership.....	79.77	21
Attract People		
2.1.3 Migrant stock.....	22.56	96
2.1.4 International students.....	n/a	n/a
2.1.5 Brain gain.....	45.73	60
2.2 Internal Openness.....	55.37	67
Social Inclusion		
2.2.1 Tolerance of minorities.....	52.22	55
2.2.2 Tolerance of immigrants.....	65.75	51
2.2.3 Social mobility.....	51.55	83
Gender Equality		
2.2.4 Female graduates.....	n/a	n/a
2.2.5 Gender development gap.....	67.72	91
2.2.6 Leadership opportunities for women.....	39.60	85

GDP per capita (PPP US\$).....	4,216.46
GDP (US\$ billions).....	26.72
GTCI score.....	31.73
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....24.93 117		
3.1 Formal Education.....	1.29	132
Enrolment		
3.1.1 Vocational enrolment.....	n/a	n/a
3.1.2 Tertiary enrolment.....	2.58	123
Quality		
3.1.3 Tertiary education expenditure.....	n/a	n/a
3.1.4 Reading, maths, and science.....	n/a	n/a
3.1.5 University ranking.....	0.00	75
3.2 Lifelong Learning.....	33.49	106
3.2.1 Quality of management schools.....	40.07	88
3.2.2 Prevalence of training in firms.....	32.72	55
3.2.3 Employee development.....	27.68	102
3.3 Access to Growth Opportunities.....	40.02	99
Empowerment		
3.3.1 Delegation of authority.....	52.53	50
3.3.2 Personal rights.....	56.33	94
Collaboration		
3.3.3 Use of virtual social networks.....	63.88	96
3.3.4 Use of virtual professional networks.....	2.01	104
3.3.5 Collaboration within organisations.....	37.38	99
3.3.6 Collaboration across organisations.....	28.01	100

4 RETAIN.....26.97 113		
4.1 Sustainability.....	26.13	109
4.1.1 Pension system.....	12.20	93
4.1.2 Social protection.....	31.21	93
4.1.3 Brain retention.....	34.99	82
4.2 Lifestyle.....	27.81	108
4.2.1 Environmental performance.....	39.24	95
4.2.2 Personal safety.....	44.96	85
4.2.3 Physician density.....	1.15	115
4.2.4 Sanitation.....	25.86	121

5 VOCATIONAL AND TECHNICAL SKILLS.....34.81 91		
5.1 Mid-Level Skills.....	19.35	104
5.1.1 Workforce with secondary education.....	36.24	80
5.1.2 Population with secondary education.....	n/a	n/a
5.1.3 Technicians and associate professionals.....	14.83	103
5.1.4 Labour productivity per employee.....	6.97	92
5.2 Employability.....	50.27	62
5.2.1 Ease of finding skilled employees.....	69.97	33
5.2.2 Relevance of education system to the economy.....	43.65	67
5.2.3 Skills matching with secondary education.....	31.40	99
5.2.4 Skills matching with tertiary education.....	56.08	62

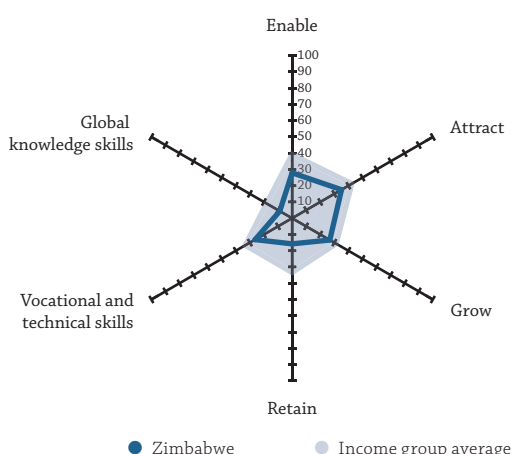
6 GLOBAL KNOWLEDGE SKILLS.....13.10 108		
6.1 High-Level Skills.....	19.81	93
6.1.1 Workforce with tertiary education.....	18.93	86
6.1.2 Population with tertiary education.....	n/a	n/a
6.1.3 Professionals.....	19.85	78
6.1.4 Researchers.....	0.37	97
6.1.5 Senior officials and managers.....	10.72	92
6.1.6 Availability of scientists and engineers.....	49.18	65
6.2 Talent Impact.....	6.40	120
6.2.1 Innovation output.....	11.03	118
6.2.2 High-value exports.....	5.86	98
6.2.3 New product entrepreneurial activity.....	9.38	87
6.2.4 New business density.....	5.34	68
6.2.5 Scientific journal articles.....	0.39	112

ZIMBABWE

Key Indicators

Rank (out of 132).....	127
Income group.....	Lower-middle income
Regional group.....	Sub-Saharan Africa
Population (millions).....	14.44

GTCI 2020 Country Profile by Pillar



	Score	Rank
1 ENABLE.....27.93 126		
1.1 Regulatory Landscape.....21.34 128		
1.1.1 Government effectiveness.....17.68 127		
1.1.2 Rule of law.....20.46 128		
1.1.3 Political stability.....48.01 107		
1.1.4 Regulatory quality.....9.71 131		
1.1.5 Corruption.....10.81 126		
1.2 Market Landscape.....28.03 123		
1.2.1 Competition intensity.....51.71 112		
1.2.2 Ease of doing business.....35.42 120		
1.2.3 Cluster development.....9.08 130		
1.2.4 R&D expenditure.....n/a n/a		
1.2.5 ICT infrastructure.....21.88 111		
1.2.6 Urban population.....22.05 119		
1.3 Business and Labour Landscape.....34.43 107		
Labour Market		
1.3.1 Tertiary-educated unemployment.....77.89 69		
1.3.2 Active labour market policies.....2.52 130		
1.3.3 Labour-employer cooperation.....28.46 92		
Management Practice		
1.3.4 Professional management.....62.34 39		
1.3.5 Relationship of pay to productivity.....29.57 120		
Technology Adoption		
1.3.6 Technology utilisation.....28.02 115		
1.3.7 Investment in emerging technologies.....12.22 126		
1.3.8 Robot density.....n/a n/a		
2 ATTRACT.....35.11 120		
2.1 External Openness.....23.97 124		
Attract Business		
2.1.1 FDI and technology transfer.....19.79 129		
2.1.2 Prevalence of foreign ownership.....41.73 107		
Attract People		
2.1.3 Migrant stock.....38.85 67		
2.1.4 International students.....1.61 91		
2.1.5 Brain gain.....17.86 121		
2.2 Internal Openness.....46.24 106		
Social Inclusion		
2.2.1 Tolerance of minorities.....36.67 81		
2.2.2 Tolerance of immigrants.....65.75 51		
2.2.3 Social mobility.....38.30 122		
Gender Equality		
2.2.4 Female graduates.....33.58 103		
2.2.5 Gender development gap.....61.98 103		
2.2.6 Leadership opportunities for women.....41.18 79		

GDP per capita (PPP US\$).....	3,024.45
GDP (US\$ billions).....	31.00
GTCI score.....	23.44
GTCI score (income group average).....	32.97

	Score	Rank
3 GROW.....26.80 112		
3.1 Formal Education.....11.88 103		
Enrolment		
3.1.1 Vocational enrolment.....n/a n/a		
3.1.2 Tertiary enrolment.....6.14 112		
Quality		
3.1.3 Tertiary education expenditure.....29.50 35		
3.1.4 Reading, maths, and science.....n/a n/a		
3.1.5 University ranking.....0.00 75		
3.2 Lifelong Learning.....34.39 98		
3.2.1 Quality of management schools.....40.04 89		
3.2.2 Prevalence of training in firms.....30.34 58		
3.2.3 Employee development.....32.80 83		
3.3 Access to Growth Opportunities.....34.12 112		
Empowerment		
3.3.1 Delegation of authority.....51.16 56		
3.3.2 Personal rights.....41.41 107		
Collaboration		
3.3.3 Use of virtual social networks.....56.01 108		
3.3.4 Use of virtual professional networks.....2.63 96		
3.3.5 Collaboration within organisations.....32.29 110		
3.3.6 Collaboration across organisations.....21.22 118		

4 RETAIN.....15.76 128		
4.1 Sustainability.....14.59 128		
4.1.1 Pension system.....18.30 83		
4.1.2 Social protection.....8.77 128		
4.1.3 Brain retention.....16.71 121		
4.2 Lifestyle.....16.92 129		
4.2.1 Environmental performance.....26.64 114		
4.2.2 Personal safety.....6.22 127		
4.2.3 Physician density.....0.93 119		
4.2.4 Sanitation.....33.91 117		

5 VOCATIONAL AND TECHNICAL SKILLS.....26.32 119		
5.1 Mid-Level Skills.....2.68 131		
5.1.1 Workforce with secondary education.....1.53 126		
5.1.2 Population with secondary education.....1.69 111		
5.1.3 Technicians and associate professionals.....6.06 117		
5.1.4 Labour productivity per employee.....1.43 106		
5.2 Employability.....49.97 63		
5.2.1 Ease of finding skilled employees.....56.93 61		
5.2.2 Relevance of education system to the economy.....52.77 48		
5.2.3 Skills matching with secondary education.....42.53 66		
5.2.4 Skills matching with tertiary education.....47.64 85		

6 GLOBAL KNOWLEDGE SKILLS.....8.75 124		
6.1 High-Level Skills.....9.98 122		
6.1.1 Workforce with tertiary education.....16.41 93		
6.1.2 Population with tertiary education.....3.79 99		
6.1.3 Professionals.....8.29 113		
6.1.4 Researchers.....0.95 88		
6.1.5 Senior officials and managers.....4.65 116		
6.1.6 Availability of scientists and engineers.....25.77 118		
6.2 Talent Impact.....7.52 117		
6.2.1 Innovation output.....15.76 107		
6.2.2 High-value exports.....5.98 97		
6.2.3 New product entrepreneurial activity.....n/a n/a		
6.2.4 New business density.....n/a n/a		
6.2.5 Scientific journal articles.....0.80 98		

Data Tables

How to Read the Data Tables

DATA TABLES

1 1.2.3 Cluster development

2 Average answer to the question: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = non-existent; 7 = widespread in many fields] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America	5.77	100.00	67	Honduras	3.76	42.51
2	Germany	5.52	92.94	68	Armenia	3.76	42.40
3	Switzerland	5.49	91.86	69	Latvia	3.76	42.37
4	Italy	5.47	91.45	70	Morocco	3.76	42.31
5	Netherlands	5.37	88.55	71	Estonia	3.73	41.67
6	Japan	5.34	87.60	72	Viet Nam	3.71	41.34
7	Malaysia	5.26	85.51	73	Colombia	3.71	40.95
8	United Kingdom	5.19	83.26	74	Gambia	3.71	40.89
9	United Arab Emirates	5.17	82.83	75	Turkey	3.67	39.77
10	Singapore	5.12	81.27	76	Bhutan	3.65	39.38
11	Sweden	5.06	79.58	77	Chile	3.64	39.10
12	Luxembourg	5.02	78.49	78	Viet Nam	3.63	38.75
13	Austria	5.00	78.08	79	Trinidad and Tobago	3.60	37.80
14	Qatar	4.94	76.29	80	Uganda	3.58	37.41
15	Belgium	4.90	74.96	81	Senegal	3.57	37.14
16	Finland	4.89	74.89	82	Guatemala	3.57	37.08
17	Norway	4.87	74.35	83	Ethiopia	3.56	36.68
18	Denmark	4.84	73.27	84	Namibia	3.53	35.99
19	France	4.79	71.94	85	Zambia	3.53	35.80
20	Saudi Arabia	4.72	70.04	86	Montenegro	3.51	35.22
21	Canada	4.72	69.87	87	Lesotho	3.49	34.81
22	Ireland	4.65	67.83	88	Brunei Darussalam	3.49	34.77
23	China	4.63	67.29	89	Nigeria	3.49	34.64
24	India	4.63	67.25	90	Russian Federation	3.49	34.60
25	Bahrain	4.62	67.06	91	Lithuania	3.48	34.42
26	Indonesia	4.60	66.44	92	Liberia	3.46	33.78
27	China	4.58	65.86	93	Algeria	3.43	33.12
28	Korea, Rep.	4.57	65.73	94	Senegal	3.42	32.64
29	Israel	4.51	63.87	95	Kazakhstan	3.41	32.50
30	Jordan	4.46	62.52	96	Penn.	3.37	31.33
31	South Africa	4.38	60.31	97	Argentina	3.35	30.64
32	Azerbaijan	4.34	59.07	98	Cabo Verde	3.29	29.10
33	Kenya	4.32	58.54	99	Nepal	3.28	28.70
34	New Zealand	4.31	58.23	100	Bosnia and Herzegovina	3.24	27.61
35	Spain	4.27	56.96	101	Ukraine	3.24	27.43
36	Portugal	4.26	56.82	102	Eswatini	3.24	27.41
37	Egypt	4.23	56.04	103	Tunisia	3.22	26.96
38	Mexico	4.23	55.87	104	Uruguay	3.22	26.93
39	Australia	4.23	55.84	105	North Macedonia	3.21	26.76
40	Malta	4.23	55.81	106	Mozambique	3.19	26.14
41	Ghana	4.17	54.22	107	Ecuador	3.19	26.13
42	Iceland	4.15	53.75	108	Cameroon	3.12	24.05
43	Cambodia	4.13	53.03	109	Malawi	3.11	23.87
44	Mauritius	4.07	51.43	110	Burundi	3.11	23.72
45	Czech Republic	4.03	50.22	111	Georgia	3.09	23.20
46	Philippines	4.00	49.25	112	Botswana	3.07	22.74
47	Kuwait	4.00	49.17	113	Romania	3.07	22.64
48	Brazil	3.98	48.85	114	Kazakhstan	3.07	22.54
49	Costa Rica	3.98	48.71	115	Paraguay	3.06	22.42
50	Pakistan	3.95	48.01	116	Albania	3.06	22.40
51	Thailand	3.93	47.22	117	Madagascar	3.03	21.46
52	Tanzania, United Rep.	3.92	47.10	118	Nicaragua	3.02	21.31
53	Jamaica	3.89	46.20	119	Burkina Faso	3.00	20.67
54	Laos PDR	3.86	45.39	120	Cote d'Ivoire	2.95	19.16
55	Slovenia	3.84	44.72	121	Greece	2.94	18.88
56	Sri Lanka	3.82	44.26	122	Bolivia, Plurinational St.	2.87	16.82
57	Dominican Republic	3.82	44.06	123	Croatia	2.83	15.66
58	Bangladesh	3.81	43.86	124	Mongolia	2.81	15.36
59	Bulgaria	3.81	43.77	125	Congo, Dem. Rep.	2.81	15.24
60	Hungary	3.81	43.77	126	Yemen	2.79	14.71
61	Slovakia	3.80	43.53	127	El Salvador	2.78	14.37
62	Poland	3.80	43.51	128	Kyrgyzstan	2.74	13.36
63	Panama	3.79	43.42	129	Moldova, Rep.	2.69	11.91
64	Mal	3.79	43.38	130	Zimbabwe	2.60	9.08
65	Cyprus	3.78	42.95	131	Venezuela, Bolivarian Rep.	2.44	4.54
66	Rwanda	3.78	42.93	132	Angola	2.28	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017-2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

THE GLOBAL TALENT COMPETITIVENESS INDEX 2023 273

SOURCE: World Economic Forum, Executive Opinion Survey 2017-2018 (<http://reports.weforum.org>)
For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

THE GLOBAL TALENT COMPETITIVENESS INDEX 2020 273

This section provides the rankings and scores for each of the 70 variables that make up the GTCI 2020.

Each data table consists of four parts:

- 1 the name of the variable,
- 2 the description or technical name and the latest year for which data are available,
- 3 the ranking, and
- 4 the source.

1 The first section provides the variable number that represents its position in the overall structure of GTCI. The first digit refers to the pillar, the second digit refers to the sub-pillar within that pillar, and the third digit refers to the position of the variable in that sub-pillar. For instance, the variable *1.2.3 Cluster development* refers to the third variable in the second sub-pillar of the first pillar.

2 The second section spells out the description or technical name of the variable, along with the latest year for which the data are available. For some countries, the year of the data differs from the most frequent year; in these cases, the most recent year available is used.

For variables derived from a published report where the publication date differs from the year the data were actually collected, the year of the data collection was used. This applies to variables taken from the Doing Business 2019 report, which was published in October 2018 and which uses data collected in 2018, for example.

For qualitative variables derived from survey responses, the question asked in the survey is shown as the exact technical name. This applies to all variables taken from the World Economic Forum's Executive Opinion Survey, for instance.

3 The ranking of the countries within the data table follows their normalised scores. There are three parts to the information in the ranking: the rank of the country, the raw value, and the normalised score. Because of the way outliers are treated, in some variables several countries have the same score. For variables in which two or more countries happen to have the same raw value (with a tie in the ranking as a result), the relevant countries have been sorted alphabetically. For more information about normalisation methods and variable names, please refer to the Technical Notes and the Sources and Definitions sections in the Appendices.

4 The final section presents all sources and a link to the data source as well as the cut-off year.

Index of Data Tables

1 ENABLE 265

1.1 Regulatory Landscape

1.1.1 Government effectiveness.....	266
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1.3 Business and Labour Landscape

1.3.1 Tertiary-educated unemployment.....	277
1.3.2 Active labour market policies.....	278
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Pillar 1

Enable

1.1.1 Government effectiveness

Government effectiveness indicator | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Singapore.....	2.21	100.00	67	Albania.....	0.08	48.37
2	Switzerland.....	2.06	96.39	68	Turkey.....	0.07	48.25
3	Norway.....	1.98	94.62	69	Indonesia.....	0.04	47.53
4	Finland.....	1.94	93.49	70	Kazakhstan.....	0.01	46.76
5	Canada.....	1.85	91.49	71	Panama.....	0.01	46.74
6	Netherlands.....	1.85	91.43	72	Viet Nam.....	0.00	46.60
7	Sweden.....	1.84	91.09	73	Mexico.....	-0.03	45.93
8	Denmark.....	1.80	90.10	74	Philippines.....	-0.06	45.02
9	New Zealand.....	1.77	89.35	75	Colombia.....	-0.07	44.91
10	Germany.....	1.72	88.22	76	Tunisia.....	-0.07	44.87
11	Luxembourg.....	1.68	87.34	77	Russian Federation.....	-0.08	44.66
12	Japan.....	1.62	85.74	78	Armenia.....	-0.10	44.20
13	United States of America.....	1.55	84.22	79	Ghana.....	-0.11	43.83
14	Australia.....	1.54	83.76	80	Peru.....	-0.13	43.44
15	Austria.....	1.46	81.97	81	Sri Lanka.....	-0.15	42.88
16	Iceland.....	1.45	81.71	82	Morocco.....	-0.16	42.66
17	United Kingdom.....	1.41	80.82	83	Azerbaijan.....	-0.16	42.62
18	United Arab Emirates.....	1.40	80.43	84	Kuwait.....	-0.17	42.50
19	Israel.....	1.39	80.13	85	Romania.....	-0.17	42.34
20	France.....	1.35	79.32	86	Iran, Islamic Rep.....	-0.19	41.91
21	Portugal.....	1.33	78.83	87	Mongolia.....	-0.26	40.19
22	Ireland.....	1.29	77.84	88	Brazil.....	-0.29	39.56
23	Belgium.....	1.18	75.19	89	Kenya.....	-0.31	38.98
24	Slovenia.....	1.17	74.92	90	Senegal.....	-0.32	38.79
25	Brunei Darussalam.....	1.14	74.28	91	Ecuador.....	-0.32	38.77
26	Estonia.....	1.12	73.60	92	Dominican Republic.....	-0.35	37.98
27	Korea, Rep.....	1.08	72.78	93	Lao PDR.....	-0.36	37.84
28	Spain.....	1.03	71.61	94	El Salvador.....	-0.37	37.68
29	Czech Republic.....	1.02	71.34	95	Bolivia, Plurinational St.....	-0.39	37.07
30	Malta.....	1.00	70.89	96	Ukraine.....	-0.46	35.39
31	Lithuania.....	0.98	70.25	97	Bosnia and Herzegovina.....	-0.48	34.85
32	Cyprus.....	0.92	68.85	98	Moldova, Rep.....	-0.51	34.15
33	Latvia.....	0.90	68.47	99	Honduras.....	-0.51	34.14
34	Mauritius.....	0.90	68.35	100	Eswatini.....	-0.58	32.55
35	Chile.....	0.85	67.18	101	Uganda.....	-0.58	32.38
36	Malaysia.....	0.84	66.86	102	Pakistan.....	-0.58	32.36
37	Slovakia.....	0.81	66.11	103	Burkina Faso.....	-0.59	32.27
38	Qatar.....	0.74	64.55	104	Algeria.....	-0.60	32.08
39	Poland.....	0.63	61.92	105	Egypt.....	-0.62	31.53
40	Croatia.....	0.58	60.52	106	Zambia.....	-0.62	31.46
41	Georgia.....	0.57	60.37	107	Tanzania, United Rep.....	-0.63	31.28
42	Bhutan.....	0.56	60.06	108	Nicaragua.....	-0.64	31.07
43	Hungary.....	0.51	58.99	109	Guatemala.....	-0.64	31.03
44	Italy.....	0.50	58.72	110	Gambia.....	-0.65	30.84
45	Jamaica.....	0.49	58.41	111	Cambodia.....	-0.66	30.66
46	Botswana.....	0.43	56.85	112	Malawi.....	-0.67	30.31
47	China.....	0.42	56.77	113	Ethiopia.....	-0.70	29.59
48	Uruguay.....	0.42	56.62	114	Kyrgyzstan.....	-0.71	29.22
49	Thailand.....	0.38	55.86	115	Bangladesh.....	-0.74	28.65
50	Greece.....	0.31	54.14	116	Côte d'Ivoire.....	-0.74	28.57
51	South Africa.....	0.28	53.29	117	Paraguay.....	-0.81	26.85
52	Bulgaria.....	0.26	52.87	118	Cameroon.....	-0.82	26.67
53	Rwanda.....	0.26	52.86	119	Lesotho.....	-0.85	25.93
54	Trinidad and Tobago.....	0.26	52.84	120	Nepal.....	-0.88	25.17
55	Saudi Arabia.....	0.25	52.54	121	Mozambique.....	-0.89	24.90
56	Costa Rica.....	0.25	52.54	122	Mali.....	-0.94	23.81
57	Oman.....	0.21	51.56	123	Nigeria.....	-0.96	23.26
58	Namibia.....	0.20	51.36	124	Angola.....	-1.03	21.60
59	Serbia.....	0.19	51.18	125	Tajikistan.....	-1.12	19.38
60	Bahrain.....	0.19	51.05	126	Madagascar.....	-1.14	18.96
61	Argentina.....	0.16	50.42	127	Zimbabwe.....	-1.19	17.68
62	Cabo Verde.....	0.16	50.33	128	Burundi.....	-1.34	14.07
63	Montenegro.....	0.15	50.28	129	Liberia.....	-1.37	13.33
64	North Macedonia.....	0.14	49.93	130	Venezuela, Bolivarian Rep.....	-1.40	12.63
65	Jordan.....	0.12	49.36	131	Congo, Dem. Rep.....	-1.63	6.93
66	India.....	0.09	48.76	132	Yemen.....	-1.92	0.00

SOURCE: World Bank, *Worldwide Governance Indicators*, 2018 Update (www.govindicators.org)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.1.2 Rule of law

Rule of law indicator | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Finland.....	2.03	100.00	67	Bulgaria.....	-0.04	51.71
2	Norway.....	2.02	99.84	68	Trinidad and Tobago.....	-0.11	50.13
3	Sweden.....	1.94	97.88	69	Senegal.....	-0.15	49.19
4	Switzerland.....	1.93	97.68	70	Armenia.....	-0.16	49.03
5	New Zealand.....	1.92	97.57	71	Jamaica.....	-0.16	49.01
6	Denmark.....	1.86	96.19	72	Morocco.....	-0.17	48.58
7	Netherlands.....	1.83	95.40	73	Serbia.....	-0.19	48.17
8	Singapore.....	1.82	95.23	74	Bosnia and Herzegovina.....	-0.21	47.73
9	Austria.....	1.81	94.99	75	North Macedonia.....	-0.24	47.01
10	Canada.....	1.80	94.73	76	Argentina.....	-0.25	46.93
11	Luxembourg.....	1.74	93.24	77	Turkey.....	-0.25	46.82
12	Australia.....	1.68	91.94	78	China.....	-0.26	46.52
13	United Kingdom.....	1.68	91.88	79	Lesotho.....	-0.27	46.25
14	United States of America.....	1.64	91.07	80	Brazil.....	-0.28	46.02
15	Germany.....	1.61	90.22	81	Eswatini.....	-0.29	45.90
16	Iceland.....	1.61	90.18	82	Uganda.....	-0.30	45.75
17	Japan.....	1.57	89.24	83	Mongolia.....	-0.30	45.59
18	France.....	1.44	86.25	84	Zambia.....	-0.33	45.03
19	Ireland.....	1.43	86.01	85	Indonesia.....	-0.35	44.57
20	Belgium.....	1.34	84.04	86	Colombia.....	-0.36	44.26
21	Estonia.....	1.28	82.60	87	Malawi.....	-0.37	44.02
22	Korea, Rep.....	1.16	79.83	88	Albania.....	-0.40	43.28
23	Malta.....	1.14	79.37	89	Burkina Faso.....	-0.40	43.22
24	Portugal.....	1.13	79.10	90	Kazakhstan.....	-0.41	43.06
25	Czech Republic.....	1.12	78.74	91	Kenya.....	-0.41	43.02
26	Slovenia.....	1.02	76.56	92	Moldova, Rep.....	-0.41	42.99
27	Israel.....	1.02	76.52	93	Philippines.....	-0.41	42.98
28	Chile.....	1.01	76.29	94	Dominican Republic.....	-0.42	42.90
29	Spain.....	1.01	76.21	95	Tanzania, United Rep.....	-0.45	42.23
30	Lithuania.....	0.99	75.84	96	Gambia.....	-0.45	42.18
31	Latvia.....	0.93	74.41	97	Ethiopia.....	-0.45	42.07
32	Cyprus.....	0.88	73.33	98	Peru.....	-0.50	40.96
33	United Arab Emirates.....	0.80	71.29	99	Egypt.....	-0.53	40.17
34	Qatar.....	0.72	69.56	100	Azerbaijan.....	-0.56	39.69
35	Mauritius.....	0.68	68.55	101	Mexico.....	-0.57	39.43
36	Brunei Darussalam.....	0.65	67.77	102	Côte d'Ivoire.....	-0.63	37.93
37	Bhutan.....	0.63	67.32	103	Nicaragua.....	-0.64	37.61
38	Uruguay.....	0.59	66.34	104	Paraguay.....	-0.65	37.46
39	Slovakia.....	0.57	66.00	105	Bangladesh.....	-0.67	36.99
40	Hungary.....	0.53	65.03	106	Nepal.....	-0.68	36.88
41	Botswana.....	0.51	64.67	107	Iran, Islamic Rep.....	-0.68	36.71
42	Poland.....	0.47	63.70	108	Ecuador.....	-0.70	36.29
43	Costa Rica.....	0.45	63.29	109	Ukraine.....	-0.71	36.05
44	Bahrain.....	0.45	63.10	110	Pakistan.....	-0.72	35.76
45	Oman.....	0.43	62.76	111	Mali.....	-0.78	34.51
46	Malaysia.....	0.41	62.34	112	Russian Federation.....	-0.79	34.13
47	Cabo Verde.....	0.41	62.31	113	El Salvador.....	-0.86	32.68
48	Romania.....	0.39	61.71	114	Madagascar.....	-0.86	32.62
49	Croatia.....	0.33	60.47	115	Algeria.....	-0.86	32.47
50	Georgia.....	0.33	60.35	116	Nigeria.....	-0.87	32.44
51	Italy.....	0.32	60.25	117	Lao PDR.....	-0.88	32.08
52	Jordan.....	0.26	58.77	118	Kyrgyzstan.....	-0.93	31.06
53	Namibia.....	0.24	58.25	119	Liberia.....	-0.97	30.11
54	Ghana.....	0.13	55.71	120	Mozambique.....	-1.01	29.16
55	Rwanda.....	0.13	55.67	121	Cameroon.....	-1.02	28.76
56	Kuwait.....	0.10	55.03	122	Honduras.....	-1.05	28.23
57	Saudi Arabia.....	0.10	54.98	123	Cambodia.....	-1.06	28.00
58	Greece.....	0.08	54.62	124	Guatemala.....	-1.06	27.91
59	Tunisia.....	0.07	54.33	125	Angola.....	-1.10	26.88
60	Viet Nam.....	0.07	54.29	126	Bolivia, Plurinational St.....	-1.21	24.45
61	Sri Lanka.....	0.06	53.96	127	Tajikistan.....	-1.35	21.04
62	Thailand.....	0.04	53.69	128	Zimbabwe.....	-1.38	20.46
63	Panama.....	0.04	53.56	129	Burundi.....	-1.40	20.08
64	Montenegro.....	0.01	52.97	130	Congo, Dem. Rep.....	-1.69	13.20
65	India.....	0.00	52.78	131	Yemen.....	-1.75	11.73
66	South Africa.....	-0.01	52.40	132	Venezuela, Bolivarian Rep.....	-2.26	0.00

SOURCE: World Bank, *Worldwide Governance Indicators*, 2018 Update (www.govindicators.org)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.1.3 Political stability

Political stability and absence of violence indicator | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	New Zealand	1.59	100.00	67	Montenegro	-0.01	65.30
2	Singapore	1.59	99.83	68	Kuwait	-0.04	64.13
3	Iceland	1.37	95.12	69	Senegal	-0.04	64.03
4	Luxembourg	1.34	94.37	70	Nicaragua	-0.05	64.02
5	Malta	1.27	92.79	71	Sri Lanka	-0.06	63.69
6	Switzerland	1.21	91.55	72	Ecuador	-0.10	62.81
7	Brunei Darussalam	1.19	91.12	73	Greece	-0.13	62.26
8	Norway	1.15	90.33	74	Gambia	-0.21	60.44
9	Bhutan	1.13	89.77	75	Moldova, Rep.	-0.24	59.75
10	Japan	1.12	89.62	76	El Salvador	-0.25	59.59
11	Canada	1.11	89.39	77	Lesotho	-0.25	59.57
12	Portugal	1.08	88.71	78	North Macedonia	-0.25	59.55
13	Finland	1.07	88.49	79	China	-0.25	59.50
14	Uruguay	1.06	88.36	80	Peru	-0.26	59.40
15	Austria	1.04	87.77	81	South Africa	-0.27	59.15
16	Botswana	1.03	87.61	82	Malawi	-0.27	59.04
17	Ireland	1.02	87.37	83	Angola	-0.29	58.55
18	Czech Republic	1.02	87.31	84	Eswatini	-0.30	58.43
19	Mauritius	0.99	86.85	85	Bolivia, Plurinational St.	-0.30	58.36
20	Sweden	0.98	86.46	86	Madagascar	-0.33	57.68
21	Netherlands	0.92	85.14	87	Georgia	-0.37	56.87
22	Cabo Verde	0.90	84.82	88	Bosnia and Herzegovina	-0.38	56.63
23	Australia	0.90	84.69	89	Brazil	-0.41	56.12
24	Slovenia	0.89	84.66	90	Morocco	-0.41	56.02
25	Slovakia	0.88	84.37	91	Liberia	-0.41	56.00
26	Denmark	0.87	84.02	92	Kyrgyzstan	-0.43	55.51
27	Mongolia	0.82	82.94	93	Indonesia	-0.51	53.78
28	Hungary	0.81	82.87	94	Jordan	-0.53	53.42
29	Lithuania	0.78	82.15	95	Honduras	-0.55	52.89
30	Croatia	0.75	81.38	96	Uganda	-0.56	52.78
31	Oman	0.74	81.30	97	Guatemala	-0.57	52.43
32	Estonia	0.66	79.52	98	Tanzania, United Rep.	-0.58	52.21
33	Namibia	0.65	79.29	99	Saudi Arabia	-0.62	51.39
34	United Arab Emirates	0.63	78.79	100	Mexico	-0.65	50.81
35	Cyprus	0.60	78.20	101	Nepal	-0.66	50.47
36	Germany	0.58	77.67	102	Tajikistan	-0.67	50.35
37	Qatar	0.55	77.01	103	Russian Federation	-0.67	50.22
38	Poland	0.52	76.46	104	Armenia	-0.71	49.53
39	Costa Rica	0.51	76.22	105	Thailand	-0.76	48.39
40	Latvia	0.46	75.12	106	Azerbaijan	-0.76	48.32
41	Lao PDR	0.43	74.45	107	Zimbabwe	-0.77	48.01
42	Belgium	0.42	74.32	108	Colombia	-0.79	47.76
43	Albania	0.40	73.74	109	India	-0.83	46.88
44	Panama	0.39	73.62	110	Israel	-0.88	45.71
45	Chile	0.38	73.32	111	Burkina Faso	-0.92	44.71
46	Bulgaria	0.37	73.21	112	Iran, Islamic Rep.	-0.93	44.60
47	Viet Nam	0.31	71.71	113	Bahrain	-0.95	44.20
48	United States of America	0.30	71.70	114	Algeria	-0.96	43.93
49	Korea, Rep.	0.29	71.37	115	Mozambique	-0.98	43.60
50	Trinidad and Tobago	0.29	71.35	116	Tunisia	-1.05	41.90
51	Spain	0.27	70.93	117	Kenya	-1.08	41.21
52	United Kingdom	0.26	70.79	118	Cameroon	-1.08	41.20
53	Jamaica	0.25	70.60	119	Côte d'Ivoire	-1.09	41.00
54	Italy	0.24	70.22	120	Venezuela, Bolivarian Rep.	-1.18	39.11
55	France	0.21	69.66	121	Philippines	-1.24	37.86
56	Argentina	0.18	68.87	122	Bangladesh	-1.25	37.59
57	Cambodia	0.17	68.70	123	Egypt	-1.42	33.94
58	Malaysia	0.16	68.55	124	Ethiopia	-1.69	27.97
59	Dominican Republic	0.16	68.53	125	Turkey	-1.80	25.57
60	Paraguay	0.12	67.60	126	Ukraine	-1.89	23.61
61	Zambia	0.11	67.44	127	Mali	-1.91	23.08
62	Serbia	0.10	67.26	128	Nigeria	-1.94	22.35
63	Ghana	0.09	66.91	129	Burundi	-1.97	21.75
64	Romania	0.06	66.27	130	Congo, Dem. Rep.	-2.30	14.48
65	Rwanda	0.04	65.87	131	Pakistan	-2.40	12.34
66	Kazakhstan	0.02	65.37	132	Yemen	-2.96	0.00

SOURCE: World Bank, *Worldwide Governance Indicators*, 2018 Update (www.govindicators.org)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.1.4 Regulatory quality

Regulatory quality indicator | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Singapore.....	2.12	100.00	67	Trinidad and Tobago.....	-0.03	48.70
2	New Zealand.....	2.09	99.35	68	Philippines.....	-0.02	48.55
3	Netherlands.....	2.05	98.34	69	Serbia.....	-0.01	48.31
4	Australia.....	1.93	95.46	70	Saudi Arabia.....	-0.00	48.07
5	Canada.....	1.89	94.39	71	Moldova, Rep.....	-0.04	47.15
6	Switzerland.....	1.88	94.32	72	Kuwait.....	-0.06	46.56
7	Finland.....	1.82	92.76	73	Dominican Republic.....	-0.08	46.15
8	Norway.....	1.81	92.60	74	Indonesia.....	-0.11	45.48
9	Sweden.....	1.80	92.23	75	Brazil.....	-0.11	45.28
10	Germany.....	1.78	91.85	76	Mongolia.....	-0.12	45.21
11	United Kingdom.....	1.71	90.17	77	Sri Lanka.....	-0.13	44.86
12	Luxembourg.....	1.69	89.60	78	Ghana.....	-0.14	44.71
13	Estonia.....	1.64	88.39	79	Senegal.....	-0.15	44.47
14	United States of America.....	1.63	88.05	80	China.....	-0.15	44.46
15	Denmark.....	1.62	87.88	81	Bosnia and Herzegovina.....	-0.15	44.41
16	Ireland.....	1.59	86.99	82	El Salvador.....	-0.15	44.34
17	Austria.....	1.44	83.37	83	Namibia.....	-0.19	43.43
18	Iceland.....	1.43	83.24	84	Cabo Verde.....	-0.20	43.07
19	Japan.....	1.37	81.81	85	Uganda.....	-0.22	42.63
20	Chile.....	1.34	80.86	86	Morocco.....	-0.23	42.49
21	Malta.....	1.28	79.56	87	Paraguay.....	-0.23	42.41
22	Israel.....	1.27	79.30	88	Kenya.....	-0.23	42.38
23	Belgium.....	1.24	78.63	89	Azerbaijan.....	-0.25	42.06
24	Czech Republic.....	1.23	78.34	90	India.....	-0.25	41.85
25	France.....	1.16	76.48	91	Guatemala.....	-0.26	41.82
26	Lithuania.....	1.16	76.46	92	Argentina.....	-0.29	40.94
27	Latvia.....	1.15	76.42	93	Ukraine.....	-0.32	40.20
28	Korea, Rep.....	1.11	75.21	94	Lesotho.....	-0.32	40.19
29	Georgia.....	1.05	73.94	95	Bhutan.....	-0.33	39.93
30	Cyprus.....	1.03	73.37	96	Kyrgyzstan.....	-0.35	39.49
31	United Arab Emirates.....	1.01	72.95	97	Côte d'Ivoire.....	-0.36	39.20
32	Mauritius.....	1.00	72.52	98	Viet Nam.....	-0.40	38.31
33	Spain.....	0.94	71.23	99	Tunisia.....	-0.41	37.98
34	Portugal.....	0.91	70.39	100	Honduras.....	-0.44	37.38
35	Poland.....	0.88	69.73	101	Burkina Faso.....	-0.44	37.20
36	Slovakia.....	0.82	68.31	102	Gambia.....	-0.45	37.09
37	Brunei Darussalam.....	0.72	65.65	103	Zambia.....	-0.47	36.65
38	Italy.....	0.70	65.37	104	Russian Federation.....	-0.48	36.42
39	Malaysia.....	0.68	64.86	105	Cambodia.....	-0.50	35.74
40	Uruguay.....	0.66	64.22	106	Eswatini.....	-0.56	34.31
41	Hungary.....	0.65	64.04	107	Mali.....	-0.57	34.03
42	Bulgaria.....	0.63	63.45	108	Tanzania, United Rep.....	-0.58	33.87
43	Slovenia.....	0.58	62.28	109	Pakistan.....	-0.59	33.52
44	North Macedonia.....	0.50	60.48	110	Nicaragua.....	-0.67	31.59
45	Romania.....	0.49	60.07	111	Madagascar.....	-0.69	31.05
46	Botswana.....	0.46	59.49	112	Nepal.....	-0.72	30.51
47	Costa Rica.....	0.45	59.08	113	Lao PDR.....	-0.72	30.38
48	Croatia.....	0.42	58.50	114	Mozambique.....	-0.73	30.18
49	Oman.....	0.42	58.42	115	Malawi.....	-0.75	29.72
50	Qatar.....	0.42	58.35	116	Bangladesh.....	-0.81	28.27
51	Peru.....	0.42	58.35	117	Cameroon.....	-0.82	27.89
52	Bahrain.....	0.41	58.26	118	Burundi.....	-0.84	27.57
53	Panama.....	0.39	57.59	119	Egypt.....	-0.86	26.93
54	Colombia.....	0.34	56.45	120	Nigeria.....	-0.89	26.35
55	Montenegro.....	0.30	55.42	121	Bolivia, Plurinational St.....	-0.90	26.03
56	Armenia.....	0.28	54.97	122	Liberia.....	-0.95	24.86
57	Greece.....	0.24	53.93	123	Ecuador.....	-1.00	23.48
58	South Africa.....	0.23	53.81	124	Ethiopia.....	-1.01	23.39
59	Albania.....	0.22	53.56	125	Angola.....	-1.04	22.46
60	Mexico.....	0.20	52.90	126	Tajikistan.....	-1.06	22.06
61	Kazakhstan.....	0.17	52.27	127	Algeria.....	-1.20	18.72
62	Rwanda.....	0.15	51.68	128	Iran, Islamic Rep.....	-1.20	18.66
63	Jamaica.....	0.14	51.65	129	Yemen.....	-1.45	12.49
64	Thailand.....	0.14	51.54	130	Congo, Dem. Rep.....	-1.47	12.11
65	Jordan.....	0.10	50.45	131	Zimbabwe.....	-1.56	9.71
66	Turkey.....	0.04	48.95	132	Venezuela, Bolivarian Rep.....	-1.96	0.00

SOURCE: World Bank, *Worldwide Governance Indicators*, 2018 Update (www.govindicators.org)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.1.5 Corruption

Corruption Perceptions Index | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Denmark	88.00	100.00	63	Lesotho	41.00	36.49
2	New Zealand	87.00	98.65	63	Trinidad and Tobago	41.00	36.49
3	Finland	85.00	95.95	63	Turkey	41.00	36.49
3	Singapore	85.00	95.95	70	Argentina	40.00	35.14
3	Sweden	85.00	95.95	71	China	39.00	33.78
3	Switzerland	85.00	95.95	71	Serbia	39.00	33.78
7	Norway	84.00	94.59	73	Bosnia and Herzegovina	38.00	32.43
8	Netherlands	82.00	91.89	73	Eswatini	38.00	32.43
9	Canada	81.00	90.54	73	Indonesia	38.00	32.43
9	Luxembourg	81.00	90.54	73	Sri Lanka	38.00	32.43
11	Germany	80.00	89.19	77	Gambia	37.00	31.08
11	United Kingdom	80.00	89.19	77	Mongolia	37.00	31.08
13	Australia	77.00	85.14	77	North Macedonia	37.00	31.08
14	Austria	76.00	83.78	77	Panama	37.00	31.08
14	Iceland	76.00	83.78	81	Albania	36.00	29.73
16	Belgium	75.00	82.43	81	Bahrain	36.00	29.73
17	Estonia	73.00	79.73	81	Colombia	36.00	29.73
17	Ireland	73.00	79.73	81	Philippines	36.00	29.73
17	Japan	73.00	79.73	81	Tanzania, United Rep.	36.00	29.73
20	France	72.00	78.38	81	Thailand	36.00	29.73
21	United States of America	71.00	77.03	87	Algeria	35.00	28.38
22	United Arab Emirates	70.00	75.68	87	Armenia	35.00	28.38
22	Uruguay	70.00	75.68	87	Brazil	35.00	28.38
24	Bhutan	68.00	72.97	87	Côte d'Ivoire	35.00	28.38
25	Chile	67.00	71.62	87	Egypt	35.00	28.38
26	Portugal	64.00	67.57	87	El Salvador	35.00	28.38
27	Brunei Darussalam	63.00	66.22	87	Peru	35.00	28.38
28	Qatar	62.00	64.86	87	Zambia	35.00	28.38
29	Botswana	61.00	63.51	95	Ecuador	34.00	27.03
29	Israel	61.00	63.51	95	Ethiopia	34.00	27.03
31	Poland	60.00	62.16	97	Moldova, Rep.	33.00	25.68
31	Slovenia	60.00	62.16	97	Pakistan	33.00	25.68
33	Cyprus	59.00	60.81	97	Viet Nam	33.00	25.68
33	Czech Republic	59.00	60.81	100	Liberia	32.00	24.32
33	Lithuania	59.00	60.81	100	Malawi	32.00	24.32
36	Georgia	58.00	59.46	100	Mali	32.00	24.32
36	Latvia	58.00	59.46	100	Ukraine	32.00	24.32
36	Spain	58.00	59.46	104	Kazakhstan	31.00	22.97
39	Cabo Verde	57.00	58.11	104	Nepal	31.00	22.97
39	Korea, Rep.	57.00	58.11	106	Dominican Republic	30.00	21.62
41	Costa Rica	56.00	56.76	107	Bolivia, Plurinational St.	29.00	20.27
41	Rwanda	56.00	56.76	107	Honduras	29.00	20.27
43	Malta	54.00	54.05	107	Kyrgyzstan	29.00	20.27
44	Namibia	53.00	52.70	107	Lao PDR	29.00	20.27
45	Italy	52.00	51.35	107	Paraguay	29.00	20.27
45	Oman	52.00	51.35	112	Iran, Islamic Rep.	28.00	18.92
47	Mauritius	51.00	50.00	112	Mexico	28.00	18.92
48	Slovakia	50.00	48.65	112	Russian Federation	28.00	18.92
49	Jordan	49.00	47.30	115	Guatemala	27.00	17.57
49	Saudi Arabia	49.00	47.30	115	Kenya	27.00	17.57
51	Croatia	48.00	45.95	115	Nigeria	27.00	17.57
52	Malaysia	47.00	44.59	118	Bangladesh	26.00	16.22
52	Romania	47.00	44.59	118	Uganda	26.00	16.22
54	Hungary	46.00	43.24	120	Azerbaijan	25.00	14.86
55	Greece	45.00	41.89	120	Cameroon	25.00	14.86
55	Montenegro	45.00	41.89	120	Madagascar	25.00	14.86
55	Senegal	45.00	41.89	120	Nicaragua	25.00	14.86
58	Jamaica	44.00	40.54	120	Tajikistan	25.00	14.86
59	Morocco	43.00	39.19	125	Mozambique	23.00	12.16
59	South Africa	43.00	39.19	126	Zimbabwe	22.00	10.81
59	Tunisia	43.00	39.19	127	Cambodia	20.00	8.11
62	Bulgaria	42.00	37.84	127	Congo, Dem. Rep.	20.00	8.11
63	Burkina Faso	41.00	36.49	129	Angola	19.00	6.76
63	Ghana	41.00	36.49	130	Venezuela, Bolivarian Rep.	18.00	5.41
63	India	41.00	36.49	131	Burundi	17.00	4.05
63	Kuwait	41.00	36.49	132	Yemen	14.00	0.00

SOURCE: Transparency International, *The Corruption Perceptions Index 2018* (<http://www.transparency.org/research/cpi>)

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1.2.1 Competition intensity

Average answer to the question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Japan.....	6.23	100.00	67	Senegal.....	5.08	67.81
2	United States of America.....	6.06	95.25	68	Greece.....	5.08	67.73
3	Korea, Rep.....	6.04	94.58	69	India.....	5.05	67.16
4	Netherlands.....	5.83	88.83	70	Bangladesh.....	5.05	67.10
5	Turkey.....	5.83	88.78	71	Albania.....	5.04	66.84
6	Malta.....	5.82	88.60	72	Morocco.....	5.03	66.55
7	France.....	5.80	88.01	73	Trinidad and Tobago.....	5.01	66.05
8	United Kingdom.....	5.79	87.81	74	Zambia.....	4.98	65.13
9	Estonia.....	5.78	87.54	75	Oman.....	4.97	64.87
10	Australia.....	5.75	86.59	76	Qatar.....	4.95	64.26
11	Austria.....	5.73	85.96	77	Egypt.....	4.94	64.09
12	Belgium.....	5.72	85.64	78	Paraguay.....	4.94	63.85
13	Singapore.....	5.70	85.28	79	Sri Lanka.....	4.92	63.32
14	Czech Republic.....	5.69	84.98	80	Bulgaria.....	4.91	63.07
15	Malaysia.....	5.60	82.52	81	Tunisia.....	4.90	62.91
16	Lesotho.....	5.58	81.94	82	Ukraine.....	4.86	61.78
17	Germany.....	5.58	81.81	83	Serbia.....	4.85	61.30
18	Jordan.....	5.56	81.34	84	Bolivia, Plurinational St.....	4.83	60.89
19	Cyprus.....	5.56	81.32	85	Moldova, Rep.....	4.83	60.82
20	Spain.....	5.55	80.93	86	Madagascar.....	4.82	60.60
21	Switzerland.....	5.53	80.48	87	Ghana.....	4.81	60.19
22	Israel.....	5.52	80.18	88	Cameroon.....	4.79	59.81
23	Sweden.....	5.51	79.84	89	Viet Nam.....	4.79	59.74
24	Lithuania.....	5.50	79.69	90	Nepal.....	4.79	59.69
25	Philippines.....	5.50	79.66	91	Montenegro.....	4.77	59.31
26	Colombia.....	5.50	79.54	92	Romania.....	4.77	59.24
27	Saudi Arabia.....	5.49	79.19	93	Georgia.....	4.76	58.90
28	Gambia.....	5.47	78.79	94	North Macedonia.....	4.74	58.50
29	Chile.....	5.47	78.70	95	Namibia.....	4.72	57.74
30	Canada.....	5.47	78.67	96	Bosnia and Herzegovina.....	4.72	57.68
31	China.....	5.46	78.51	97	Mongolia.....	4.71	57.60
32	Latvia.....	5.46	78.36	98	Finland.....	4.70	57.38
33	Thailand.....	5.45	78.27	99	Botswana.....	4.70	57.37
34	Slovakia.....	5.42	77.48	100	Uruguay.....	4.69	56.98
35	Armenia.....	5.42	77.26	101	Azerbaijan.....	4.68	56.63
36	Indonesia.....	5.39	76.50	102	Tajikistan.....	4.67	56.52
37	Slovenia.....	5.38	76.23	103	Bhutan.....	4.67	56.51
38	Costa Rica.....	5.37	76.00	104	Brunei Darussalam.....	4.67	56.42
39	El Salvador.....	5.37	75.89	105	Malawi.....	4.67	56.30
40	Guatemala.....	5.37	75.84	106	Nicaragua.....	4.62	54.97
41	Peru.....	5.35	75.42	107	Kazakhstan.....	4.60	54.51
42	Luxembourg.....	5.35	75.29	108	Cambodia.....	4.58	53.83
43	Uganda.....	5.34	75.20	109	Tanzania, United Rep.....	4.56	53.42
44	Jamaica.....	5.32	74.66	110	Hungary.....	4.56	53.31
45	Kenya.....	5.32	74.57	111	Rwanda.....	4.50	51.77
46	United Arab Emirates.....	5.28	73.58	112	Zimbabwe.....	4.50	51.71
47	Italy.....	5.28	73.51	113	Mali.....	4.50	51.67
48	South Africa.....	5.27	73.16	114	Iran, Islamic Rep.....	4.48	51.11
49	Denmark.....	5.25	72.71	115	Pakistan.....	4.46	50.64
50	Russian Federation.....	5.25	72.65	116	Burkina Faso.....	4.46	50.63
51	New Zealand.....	5.25	72.56	117	Croatia.....	4.42	49.57
52	Panama.....	5.24	72.33	118	Kyrgyzstan.....	4.39	48.56
53	Mauritius.....	5.23	72.08	119	Eswatini.....	4.37	48.04
54	Portugal.....	5.22	71.78	120	Cabo Verde.....	4.37	48.01
55	Dominican Republic.....	5.22	71.77	121	Kuwait.....	4.36	47.80
56	Côte d'Ivoire.....	5.21	71.61	122	Argentina.....	4.32	46.76
57	Poland.....	5.21	71.54	123	Algeria.....	4.30	46.13
58	Mexico.....	5.21	71.46	124	Mozambique.....	4.29	45.92
59	Bahrain.....	5.21	71.45	125	Liberia.....	4.21	43.43
60	Iceland.....	5.20	71.27	126	Lao PDR.....	4.14	41.71
61	Ecuador.....	5.19	70.80	127	Congo, Dem. Rep.....	4.08	40.05
62	Honduras.....	5.17	70.31	128	Yemen.....	4.02	38.32
63	Ireland.....	5.16	70.19	129	Burundi.....	3.91	35.14
64	Norway.....	5.16	70.11	130	Ethiopia.....	3.73	30.29
65	Nigeria.....	5.12	69.11	131	Angola.....	2.95	8.37
66	Brazil.....	5.09	68.26	132	Venezuela, Bolivarian Rep.....	2.65	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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1.2.2 Ease of doing business

Ease of doing business index | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	New Zealand	86.59	100.00	67	Greece	68.08	66.93
2	Singapore	85.24	97.59	68	Indonesia	67.96	66.72
3	Denmark	84.64	96.52	69	Mongolia	67.74	66.33
4	Korea, Rep.	84.14	95.62	70	Jamaica	67.47	65.84
5	Georgia	83.28	94.09	71	India	67.23	65.42
6	Norway	82.95	93.50	72	Oman	67.19	65.34
7	United States of America	82.75	93.14	73	Panama	66.12	63.43
8	United Kingdom	82.65	92.96	74	Tunisia	66.11	63.42
9	North Macedonia	81.55	91.00	75	Bhutan	66.08	63.36
10	United Arab Emirates	81.28	90.51	76	South Africa	66.03	63.27
11	Sweden	81.27	90.50	77	Qatar	65.89	63.02
12	Lithuania	80.83	89.71	78	Malta	65.43	62.20
13	Malaysia	80.60	89.30	79	El Salvador	65.41	62.17
14	Estonia	80.50	89.12	80	Botswana	65.40	62.15
15	Finland	80.35	88.85	81	Zambia	65.08	61.58
16	Australia	80.13	88.46	82	Bosnia and Herzegovina	63.82	59.32
17	Latvia	79.59	87.50	83	Saudi Arabia	63.50	58.75
18	Mauritius	79.58	87.48	84	Uruguay	62.60	57.15
19	Iceland	79.35	87.07	85	Kuwait	62.20	56.43
20	Canada	79.26	86.91	86	Guatemala	62.17	56.38
21	Ireland	78.91	86.28	87	Sri Lanka	61.22	54.68
22	Germany	78.90	86.26	88	Dominican Republic	61.12	54.50
23	Azerbaijan	78.64	85.80	89	Jordan	60.98	54.25
24	Austria	78.57	85.67	90	Trinidad and Tobago	60.81	53.95
25	Thailand	78.45	85.46	91	Lesotho	60.60	53.57
26	Kazakhstan	77.89	84.46	92	Namibia	60.53	53.45
27	Rwanda	77.88	84.44	93	Brazil	60.01	52.52
28	Spain	77.68	84.08	94	Nepal	59.63	51.84
29	Russian Federation	77.37	83.53	95	Malawi	59.59	51.77
30	France	77.29	83.39	96	Paraguay	59.40	51.43
31	Poland	76.95	82.78	97	Ghana	59.22	51.11
32	Portugal	76.55	82.07	98	Eswatini	58.95	50.63
33	Czech Republic	76.10	81.26	99	Argentina	58.80	50.36
34	Netherlands	76.04	81.15	100	Egypt	58.56	49.93
35	Switzerland	75.69	80.53	101	Honduras	58.22	49.32
36	Japan	75.65	80.46	102	Côte d'Ivoire	58.00	48.93
37	Slovenia	75.61	80.39	103	Ecuador	57.94	48.82
38	Armenia	75.37	79.96	104	Philippines	57.68	48.36
39	Slovakia	75.17	79.60	105	Tajikistan	57.11	47.34
40	Turkey	74.33	78.10	106	Uganda	57.06	47.25
41	Belgium	73.95	77.42	107	Iran, Islamic Rep.	56.98	47.11
42	China	73.64	76.87	108	Cabo Verde	55.95	45.27
43	Moldova, Rep.	73.54	76.69	109	Nicaragua	55.64	44.71
44	Serbia	73.49	76.60	110	Mozambique	55.53	44.52
45	Israel	73.23	76.13	111	Pakistan	55.31	44.12
46	Montenegro	72.73	75.24	112	Cambodia	54.80	43.21
47	Italy	72.56	74.94	113	Senegal	54.15	42.05
48	Romania	72.30	74.47	114	Tanzania, United Rep.	53.63	41.12
49	Hungary	72.28	74.44	115	Mali	53.50	40.89
50	Mexico	72.09	74.10	116	Nigeria	52.89	39.80
51	Brunei Darussalam	72.03	73.99	117	Gambia	51.72	37.71
52	Chile	71.81	73.60	118	Burkina Faso	51.57	37.44
53	Cyprus	71.71	73.42	119	Lao PDR	51.26	36.89
54	Croatia	71.40	72.87	120	Zimbabwe	50.44	35.42
55	Bulgaria	71.24	72.58	121	Bolivia, Plurinational St.	50.32	35.21
56	Morocco	71.02	72.19	122	Algeria	49.65	34.01
57	Kenya	70.31	70.92	123	Ethiopia	49.06	32.96
58	Bahrain	69.85	70.10	124	Madagascar	48.89	32.65
59	Albania	69.51	69.49	125	Cameroon	47.78	30.67
60	Colombia	69.24	69.01	126	Burundi	47.41	30.01
61	Luxembourg	69.01	68.60	127	Angola	43.86	23.67
62	Costa Rica	68.89	68.38	128	Liberia	43.51	23.04
63	Peru	68.83	68.27	129	Bangladesh	41.97	20.29
64	Viet Nam	68.36	67.43	130	Congo, Dem. Rep.	36.85	11.15
65	Kyrgyzstan	68.33	67.38	131	Yemen	32.41	3.22
66	Ukraine	68.25	67.24	132	Venezuela, Bolivarian Rep.	30.61	0.00

SOURCE: World Bank, *Doing Business 2019: Training for Reform* (<http://www.doingbusiness.org/en/reports/global-reports/doing-business-2019>)
For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.2.3 Cluster development

Average answer to the question: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = nonexistent; 7 = widespread in many fields] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	5.77	100.00	67	Honduras.....	3.76	42.51
2	Germany.....	5.52	92.94	68	Armenia.....	3.76	42.40
3	Switzerland.....	5.49	91.86	69	Latvia.....	3.76	42.37
4	Italy.....	5.47	91.45	70	Morocco.....	3.76	42.31
5	Netherlands.....	5.37	88.55	71	Estonia.....	3.73	41.67
6	Japan.....	5.34	87.60	72	Viet Nam.....	3.71	41.14
7	Malaysia.....	5.26	85.51	73	Colombia.....	3.71	40.95
8	United Kingdom.....	5.19	83.26	74	Gambia.....	3.71	40.89
9	United Arab Emirates.....	5.17	82.83	75	Turkey.....	3.67	39.77
10	Singapore.....	5.12	81.27	76	Bhutan.....	3.65	39.38
11	Sweden.....	5.06	79.58	77	Chile.....	3.64	39.10
12	Luxembourg.....	5.02	78.49	78	Iran, Islamic Rep.....	3.63	38.75
13	Austria.....	5.00	78.08	79	Trinidad and Tobago.....	3.60	37.80
14	Qatar.....	4.94	76.29	80	Uganda.....	3.58	37.41
15	Belgium.....	4.90	74.96	81	Serbia.....	3.57	37.14
16	Finland.....	4.89	74.89	82	Guatemala.....	3.57	37.08
17	Norway.....	4.87	74.35	83	Ethiopia.....	3.56	36.68
18	Denmark.....	4.84	73.27	84	Namibia.....	3.53	35.99
19	France.....	4.79	71.94	85	Zambia.....	3.53	35.80
20	Saudi Arabia.....	4.72	70.04	86	Montenegro.....	3.51	35.22
21	Canada.....	4.72	69.87	87	Lesotho.....	3.49	34.81
22	Ireland.....	4.65	67.83	88	Brunei Darussalam.....	3.49	34.77
23	Oman.....	4.63	67.29	89	Nigeria.....	3.49	34.64
24	India.....	4.63	67.25	90	Russian Federation.....	3.49	34.60
25	Bahrain.....	4.62	67.06	91	Lithuania.....	3.48	34.42
26	Indonesia.....	4.60	66.44	92	Liberia.....	3.46	33.78
27	China.....	4.58	65.86	93	Algeria.....	3.43	33.12
28	Korea, Rep.....	4.57	65.73	94	Senegal.....	3.42	32.64
29	Israel.....	4.51	63.87	95	Tajikistan.....	3.41	32.50
30	Jordan.....	4.46	62.52	96	Peru.....	3.37	31.33
31	South Africa.....	4.38	60.31	97	Argentina.....	3.35	30.64
32	Azerbaijan.....	4.34	59.07	98	Cabo Verde.....	3.29	29.10
33	Kenya.....	4.32	58.54	99	Nepal.....	3.28	28.70
34	New Zealand.....	4.31	58.23	100	Bosnia and Herzegovina.....	3.24	27.61
35	Spain.....	4.27	56.96	101	Ukraine.....	3.24	27.43
36	Portugal.....	4.26	56.82	102	Eswatini.....	3.24	27.41
37	Egypt.....	4.23	56.04	103	Tunisia.....	3.22	26.96
38	Mexico.....	4.23	55.87	104	Uruguay.....	3.22	26.93
39	Australia.....	4.23	55.84	105	North Macedonia.....	3.21	26.76
40	Malta.....	4.23	55.81	106	Mozambique.....	3.19	26.14
41	Ghana.....	4.17	54.22	107	Ecuador.....	3.19	26.13
42	Iceland.....	4.15	53.75	108	Cameroon.....	3.12	24.05
43	Cambodia.....	4.13	53.03	109	Malawi.....	3.11	23.87
44	Mauritius.....	4.07	51.43	110	Burundi.....	3.11	23.72
45	Czech Republic.....	4.03	50.22	111	Georgia.....	3.09	23.20
46	Philippines.....	4.00	49.25	112	Botswana.....	3.07	22.74
47	Kuwait.....	4.00	49.17	113	Romania.....	3.07	22.64
48	Brazil.....	3.98	48.85	114	Kazakhstan.....	3.07	22.54
49	Costa Rica.....	3.98	48.71	115	Paraguay.....	3.06	22.42
50	Pakistan.....	3.95	48.01	116	Albania.....	3.06	22.40
51	Thailand.....	3.93	47.22	117	Madagascar.....	3.03	21.66
52	Tanzania, United Rep.....	3.92	47.10	118	Nicaragua.....	3.02	21.31
53	Jamaica.....	3.89	46.20	119	Burkina Faso.....	3.00	20.67
54	Lao PDR.....	3.86	45.39	120	Côte d'Ivoire.....	2.95	19.16
55	Slovenia.....	3.84	44.72	121	Greece.....	2.94	18.88
56	Sri Lanka.....	3.82	44.26	122	Bolivia, Plurinational St.....	2.87	16.82
57	Dominican Republic.....	3.82	44.06	123	Croatia.....	2.83	15.66
58	Bangladesh.....	3.81	43.86	124	Mongolia.....	2.81	15.36
59	Bulgaria.....	3.81	43.77	125	Congo, Dem. Rep.....	2.81	15.24
60	Hungary.....	3.81	43.77	126	Yemen.....	2.79	14.71
61	Slovakia.....	3.80	43.53	127	El Salvador.....	2.78	14.37
62	Poland.....	3.80	43.51	128	Kyrgyzstan.....	2.74	13.36
63	Panama.....	3.79	43.42	129	Moldova, Rep.....	2.69	11.91
64	Mali.....	3.79	43.38	130	Zimbabwe.....	2.60	9.08
65	Cyprus.....	3.78	42.95	131	Venezuela, Bolivarian Rep.....	2.44	4.54
66	Rwanda.....	3.78	42.93	132	Angola.....	2.28	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.2.4 R&D expenditure

Gross expenditure on R&D (%) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Israel	4.58	100.00	67	Ukraine	0.45	9.51
2	Korea, Rep.	4.55	99.50	68	Ecuador	0.44	9.38
3	Switzerland	3.37	73.65	69	Uruguay	0.41	8.63
4	Sweden	3.31	72.29	70	Congo, Dem. Rep.	0.41	8.59
5	Japan	3.20	69.93	71	Ghana	0.38	7.93
6	Austria	3.16	68.94	72	Mauritius	0.36	7.66
7	Denmark	3.10	67.70	73	Chile	0.36	7.63
8	Germany	3.04	66.22	74	North Macedonia	0.35	7.43
9	United States of America	2.80	61.10	75	Namibia	0.34	7.13
10	Finland	2.76	60.23	76	Mozambique	0.34	7.08
11	Belgium	2.61	56.81	77	Montenegro	0.32	6.79
12	Singapore	2.22	48.45	78	Nepal	0.30	6.30
13	France	2.19	47.66	79	Moldova, Rep.	0.30	6.30
14	Iceland	2.18	47.44	80	Mali	0.29	6.10
15	China	2.13	46.34	81	Georgia	0.29	6.03
16	Norway	2.11	46.01	82	Zambia	0.28	5.78
17	Netherlands	2.00	43.56	83	Eswatini	0.27	5.60
18	Australia	1.92	41.84	84	Iran, Islamic Rep.	0.25	5.22
19	Slovenia	1.85	40.26	85	Colombia	0.24	5.03
20	Czech Republic	1.79	38.97	86	Indonesia	0.24	4.90
21	United Kingdom	1.67	36.37	87	Pakistan	0.24	4.85
22	Canada	1.59	34.43	88	Armenia	0.23	4.67
23	Malaysia	1.44	31.20	89	Oman	0.22	4.54
24	Italy	1.36	29.50	90	Bosnia and Herzegovina	0.20	4.05
25	Hungary	1.35	29.38	91	Azerbaijan	0.19	3.74
26	Portugal	1.33	28.78	92	Uganda	0.17	3.42
27	Estonia	1.32	28.68	93	Bolivia, Plurinational St.	0.16	3.12
28	Brazil	1.27	27.43	94	Albania	0.15	3.06
29	Luxembourg	1.25	27.18	95	Paraguay	0.15	3.05
30	New Zealand	1.23	26.65	96	El Salvador	0.15	2.89
31	Spain	1.21	26.15	97	Philippines	0.14	2.70
32	Greece	1.14	24.76	98	Mongolia	0.13	2.62
33	Russian Federation	1.11	23.96	99	Gambia	0.13	2.60
34	Ireland	1.04	22.56	100	Kazakhstan	0.13	2.59
35	Poland	1.04	22.44	101	Burundi	0.12	2.34
36	United Arab Emirates	0.96	20.81	102	Peru	0.12	2.32
37	Turkey	0.96	20.76	103	Venezuela, Bolivarian Rep.	0.12	2.28
38	Serbia	0.93	20.07	104	Cambodia	0.12	2.27
39	Lithuania	0.89	19.25	105	Tajikistan	0.12	2.21
40	Slovakia	0.88	19.00	106	Kyrgyzstan	0.11	2.07
41	Croatia	0.87	18.75	107	Sri Lanka	0.11	2.06
42	South Africa	0.82	17.67	108	Nicaragua	0.11	2.06
43	Saudi Arabia	0.82	17.55	109	Bahrain	0.10	1.90
44	Kenya	0.79	16.91	110	Côte d'Ivoire	0.09	1.71
45	Thailand	0.78	16.81	111	Trinidad and Tobago	0.09	1.69
46	Bulgaria	0.77	16.58	112	Kuwait	0.08	1.45
47	Senegal	0.75	16.16	113	Cabo Verde	0.07	1.27
48	Jordan	0.72	15.41	114	Panama	0.06	1.04
49	Morocco	0.71	15.34	115	Lesotho	0.05	0.73
50	Burkina Faso	0.67	14.38	116	Guatemala	0.03	0.33
51	India	0.62	13.27	117	Honduras	0.01	0.01
52	Egypt	0.61	12.96	118	Madagascar	0.01	0.00
53	Ethiopia	0.60	12.94		Angola	n/a	n/a
54	Tunisia	0.60	12.83		Bangladesh	n/a	n/a
55	Cyprus	0.57	12.08		Bhutan	n/a	n/a
56	Malta	0.55	11.72		Brunei Darussalam	n/a	n/a
57	Botswana	0.54	11.46		Cameroon	n/a	n/a
58	Algeria	0.53	11.38		Dominican Republic	n/a	n/a
59	Argentina	0.53	11.36		Jamaica	n/a	n/a
60	Tanzania, United Rep.	0.53	11.28		Lao PDR	n/a	n/a
61	Viet Nam	0.53	11.22		Liberia	n/a	n/a
62	Latvia	0.51	10.94		Malawi	n/a	n/a
63	Qatar	0.51	10.85		Nigeria	n/a	n/a
64	Romania	0.50	10.71		Rwanda	n/a	n/a
65	Mexico	0.49	10.35		Yemen	n/a	n/a
66	Costa Rica	0.46	9.72		Zimbabwe	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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1.2.5 ICT infrastructure

ICT access index | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Luxembourg	9.54	100.00	67	Morocco	6.06	55.73
2	Iceland	9.38	97.96	68	Jordan	6.03	55.34
3	United Kingdom	9.15	95.04	69	Panama	5.95	54.33
4	Malta	9.02	93.38	70	Colombia	5.88	53.44
5	Germany	8.93	92.24	71	Bosnia and Herzegovina	5.84	52.93
6	Korea, Rep.	8.85	91.22	72	Cabo Verde	5.76	51.91
6	Switzerland	8.85	91.22	73	China	5.58	49.62
8	Japan	8.80	90.59	74	South Africa	5.48	48.35
9	Netherlands	8.65	88.68	74	Thailand	5.48	48.35
10	France	8.64	88.55	76	Egypt	5.40	47.33
11	Singapore	8.61	88.17	77	Jamaica	5.29	45.93
12	Sweden	8.55	87.40	78	Mexico	5.28	45.80
13	Denmark	8.39	85.37	79	Venezuela, Bolivarian Rep.	5.15	44.15
14	Austria	8.38	85.24	80	Algeria	5.14	44.02
15	New Zealand	8.34	84.73	81	Tunisia	5.11	43.64
16	United States of America	8.27	83.84	82	Ecuador	4.93	41.35
17	Israel	8.17	82.57	83	Botswana	4.90	40.97
18	Estonia	8.16	82.44	83	Peru	4.90	40.97
19	Belgium	8.15	82.32	85	Philippines	4.87	40.59
20	Bahrain	8.14	82.19	86	Indonesia	4.85	40.33
20	Ireland	8.14	82.19	87	Albania	4.80	39.69
22	United Arab Emirates	8.11	81.81	88	El Salvador	4.75	39.06
23	Australia	8.00	80.41	88	Viet Nam	4.75	39.06
23	Norway	8.00	80.41	90	Mongolia	4.74	38.93
25	Spain	7.98	80.15	91	Sri Lanka	4.66	37.91
26	Canada	7.93	79.52	92	Kyrgyzstan	4.54	36.39
27	Portugal	7.91	79.26	93	Guatemala	4.52	36.13
27	Slovenia	7.91	79.26	94	Bolivia, Plurinational St.	4.42	34.86
29	Qatar	7.90	79.13	95	Paraguay	4.41	34.73
30	Cyprus	7.86	78.63	96	Namibia	4.39	34.48
31	Hungary	7.78	77.61	97	Ghana	4.36	34.10
32	Greece	7.76	77.35	98	Dominican Republic	4.30	33.33
33	Croatia	7.60	75.32	99	Nicaragua	4.19	31.93
34	Poland	7.58	75.06	100	Cambodia	4.16	31.55
35	Moldova, Rep.	7.56	74.81	101	Bhutan	4.09	30.66
36	Kazakhstan	7.55	74.68	102	Honduras	4.08	30.53
37	Brunei Darussalam	7.47	73.66	103	Côte d'Ivoire	3.92	28.50
38	Latvia	7.41	72.90	104	Gambia	3.77	26.59
39	Finland	7.35	72.14	105	Lesotho	3.72	25.95
40	Italy	7.33	71.88	106	Kenya	3.63	24.81
41	Oman	7.32	71.76	107	Nepal	3.62	24.68
42	Uruguay	7.28	71.25	108	India	3.60	24.43
43	Russian Federation	7.23	70.61	109	Senegal	3.57	24.05
44	Slovakia	7.22	70.48	110	Lao PDR	3.47	22.77
45	Saudi Arabia	7.21	70.36	111	Zimbabwe	3.40	21.88
46	Serbia	7.20	70.23	112	Pakistan	3.34	21.12
47	Trinidad and Tobago	7.18	69.97	113	Mali	3.16	18.83
48	Czech Republic	7.14	69.47	113	Nigeria	3.16	18.83
49	Kuwait	7.12	69.21	115	Bangladesh	3.05	17.43
50	Lithuania	7.11	69.08	116	Zambia	2.85	14.89
51	Mauritius	7.04	68.19	117	Cameroon	2.84	14.76
52	Montenegro	7.03	68.07	118	Burkina Faso	2.82	14.50
53	Romania	6.98	67.43	119	Rwanda	2.67	12.60
54	Malaysia	6.93	66.79	120	Angola	2.62	11.96
55	Argentina	6.87	66.03	121	Mozambique	2.53	10.81
56	Bulgaria	6.83	65.52	122	Tanzania, United Rep.	2.52	10.69
57	Chile	6.79	65.01	123	Uganda	2.46	9.92
58	Iran, Islamic Rep.	6.74	64.38	124	Ethiopia	2.35	8.52
59	North Macedonia	6.66	63.36	125	Madagascar	2.29	7.76
60	Azerbaijan	6.62	62.85	126	Malawi	2.18	6.36
61	Ukraine	6.60	62.60	127	Burundi	2.14	5.85
62	Armenia	6.52	61.58	128	Congo, Dem. Rep.	1.68	0.00
63	Costa Rica	6.40	60.05		Eswatini	n/a	n/a
64	Turkey	6.30	58.78		Liberia	n/a	n/a
65	Georgia	6.26	58.27		Tajikistan	n/a	n/a
66	Brazil	6.25	58.14		Yemen	n/a	n/a

SOURCE: International Telecommunication Union, *Measuring the Information Society Report 2017*, ICT Development Index 2017 (<http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.2.6 Urban population

Population of urban areas (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Kuwait	100.00	100.00	67	Ecuador	63.82	58.40
1	Singapore	100.00	100.00	68	Ireland	63.17	57.65
3	Qatar	99.14	99.01	69	Armenia	63.15	57.63
4	Belgium	98.00	97.70	70	Morocco	62.45	56.83
5	Uruguay	95.33	94.63	71	Paraguay	61.58	55.83
6	Malta	94.61	93.80	72	Gambia	61.27	55.47
7	Iceland	93.81	92.89	73	Albania	60.32	54.37
8	Israel	92.42	91.28	74	Poland	60.06	54.07
9	Argentina	91.87	90.65	75	China	59.15	53.03
10	Japan	91.62	90.36	76	Georgia	58.63	52.43
11	Netherlands	91.49	90.21	77	Nicaragua	58.52	52.31
12	Luxembourg	90.98	89.63	78	Austria	58.30	52.05
13	Jordan	90.98	89.63	79	North Macedonia	57.96	51.66
14	Bahrain	89.29	87.68	80	Kazakhstan	57.43	51.05
15	Venezuela, Bolivarian Rep.	88.21	86.44	81	Honduras	57.10	50.67
16	Denmark	87.87	86.06	82	Croatia	56.95	50.50
17	Chile	87.56	85.70	83	Cameroon	56.37	49.84
18	Sweden	87.43	85.55	84	Serbia	56.09	49.51
19	Brazil	86.57	84.56	85	Ghana	56.06	49.48
20	New Zealand	86.54	84.52	86	Azerbaijan	55.68	49.04
21	United Arab Emirates	86.52	84.50	87	Jamaica	55.67	49.03
22	Australia	86.01	83.92	88	Indonesia	55.32	48.63
23	Finland	85.38	83.19	89	Slovenia	54.54	47.73
24	Oman	84.54	82.22	90	Romania	54.00	47.10
25	Saudi Arabia	83.84	81.42	91	Slovakia	53.73	46.79
26	United Kingdom	83.40	80.91	92	Trinidad and Tobago	53.18	46.17
27	United States of America	82.26	79.60	93	Liberia	51.15	43.83
28	Norway	82.25	79.59	94	Guatemala	51.05	43.72
29	Korea, Rep.	81.46	78.68	95	Côte d'Ivoire	50.78	43.40
30	Canada	81.41	78.63	96	Nigeria	50.34	42.90
31	Dominican Republic	81.07	78.24	97	Namibia	50.03	42.55
32	Colombia	80.78	77.90	98	Thailand	49.95	42.45
33	France	80.44	77.51	99	Bosnia and Herzegovina	48.25	40.49
34	Spain	80.32	77.37	100	Senegal	47.19	39.28
35	Mexico	80.16	77.18	101	Philippines	46.91	38.95
36	Costa Rica	79.34	76.24	102	Congo, Dem. Rep.	44.46	36.14
37	Greece	79.06	75.92	103	Zambia	43.52	35.06
38	Peru	77.91	74.60	104	Egypt	42.70	34.12
39	Brunei Darussalam	77.63	74.28	105	Moldova, Rep.	42.63	34.03
40	Germany	77.31	73.91	106	Mali	42.36	33.72
41	Malaysia	76.04	72.44	107	Bhutan	40.90	32.04
42	Turkey	75.14	71.42	108	Mauritius	40.79	31.92
43	Bulgaria	75.01	71.26	109	Madagascar	37.19	27.78
44	Iran, Islamic Rep.	74.90	71.14	110	Pakistan	36.67	27.18
45	Russian Federation	74.43	70.60	111	Yemen	36.64	27.15
46	Switzerland	73.80	69.87	112	Bangladesh	36.63	27.14
47	Czech Republic	73.79	69.86	113	Kyrgyzstan	36.35	26.81
48	Algeria	72.63	68.53	114	Mozambique	35.99	26.40
49	El Salvador	72.02	67.83	115	Viet Nam	35.92	26.32
50	Hungary	71.35	67.06	116	Lao PDR	35.00	25.26
51	Italy	70.44	66.01	117	India	34.03	24.14
52	Botswana	69.45	64.87	118	Tanzania, United Rep.	33.78	23.85
53	Bolivia, Plurinational St.	69.43	64.84	119	Zimbabwe	32.21	22.05
54	Ukraine	69.35	64.76	120	Burkina Faso	29.36	18.77
55	Tunisia	68.95	64.29	121	Lesotho	28.15	17.39
56	Estonia	68.88	64.22	122	Tajikistan	27.13	16.22
57	Mongolia	68.45	63.72	123	Kenya	27.03	16.10
58	Latvia	68.14	63.37	124	Eswatini	23.80	12.38
59	Panama	67.71	62.87	125	Uganda	23.77	12.35
60	Lithuania	67.68	62.84	126	Cambodia	23.39	11.91
61	Montenegro	66.81	61.84	127	Ethiopia	20.76	8.89
62	Cyprus	66.81	61.84	128	Nepal	19.74	7.71
63	South Africa	66.36	61.31	129	Sri Lanka	18.48	6.26
64	Cabo Verde	65.73	60.60	130	Rwanda	17.21	4.81
65	Angola	65.51	60.35	131	Malawi	16.94	4.49
66	Portugal	65.21	60.00	132	Burundi	13.03	0.00

SOURCE: United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2018 Revision* (<https://population.un.org/wup/>)
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1.3.1 Tertiary-educated unemployment

Unemployment rate with tertiary education (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Gambia.....	0.05	100.00	67	Cabo Verde.....	6.19	79.65
2	Qatar.....	0.57	98.26	68	Sri Lanka.....	6.22	79.57
3	Cambodia.....	0.91	97.12	69	Zimbabwe.....	6.72	77.89
4	Czech Republic.....	1.19	96.23	70	Brazil.....	6.86	77.44
5	Hungary.....	1.46	95.31	71	Botswana.....	6.90	77.30
6	Thailand.....	1.58	94.92	72	Lao PDR.....	6.90	77.30
7	Iceland.....	1.86	93.99	73	Mongolia.....	7.00	76.98
8	Germany.....	1.87	93.96	74	Chile.....	7.02	76.90
9	Malta.....	1.94	93.73	75	Zambia.....	7.03	76.89
10	Poland.....	2.01	93.50	76	Nicaragua.....	7.10	76.64
11	Romania.....	2.14	93.07	77	Pakistan.....	7.15	76.48
12	Trinidad and Tobago.....	2.16	93.00	78	Mauritius.....	7.31	75.94
13	Japan.....	2.30	92.53	79	Mozambique.....	7.33	75.87
14	Bulgaria.....	2.31	92.48	80	Kyrgyzstan.....	7.47	75.41
15	Norway.....	2.32	92.45	81	Brunei Darussalam.....	7.48	75.39
16	United States of America.....	2.45	92.04	82	Philippines.....	7.51	75.28
17	Bahrain.....	2.46	92.00	83	Cyprus.....	7.58	75.06
18	Netherlands.....	2.47	91.96	84	Honduras.....	7.65	74.83
19	United Kingdom.....	2.51	91.84	85	Ukraine.....	7.70	74.65
20	Paraguay.....	2.76	91.00	86	Kenya.....	7.82	74.26
21	Lithuania.....	2.80	90.87	87	Venezuela, Bolivarian Rep.....	7.95	73.84
22	Guatemala.....	2.91	90.51	88	Liberia.....	8.09	73.36
23	Israel.....	2.92	90.47	89	India.....	8.37	72.44
24	Uruguay.....	3.01	90.18	90	Madagascar.....	8.45	72.17
25	Slovakia.....	3.08	89.97	91	Nepal.....	8.46	72.14
26	Moldova, Rep.....	3.11	89.86	92	Spain.....	8.91	70.65
27	Panama.....	3.21	89.53	93	Montenegro.....	10.29	66.08
28	Austria.....	3.22	89.49	94	Saudi Arabia.....	10.65	64.88
29	United Arab Emirates.....	3.33	89.13	95	Bangladesh.....	10.74	64.60
30	Australia.....	3.42	88.83	96	Serbia.....	10.82	64.32
31	Belgium.....	3.45	88.73	97	Colombia.....	11.21	63.02
32	Switzerland.....	3.48	88.64	98	Eswatini.....	11.34	62.59
33	Estonia.....	3.56	88.36	99	Burkina Faso.....	11.49	62.11
34	Sweden.....	3.58	88.31	100	Congo, Dem. Rep.....	11.92	60.68
35	Slovenia.....	3.62	88.15	101	South Africa.....	12.03	60.31
36	Argentina.....	3.64	88.10	102	Namibia.....	12.18	59.82
37	Latvia.....	3.66	88.02	103	Turkey.....	12.19	59.79
38	Kazakhstan.....	3.71	87.87	104	Côte d'Ivoire.....	12.39	59.13
39	Ireland.....	3.81	87.53	105	Angola.....	12.64	58.30
40	New Zealand.....	3.97	87.00	106	Cameroon.....	13.30	56.12
41	Malaysia.....	4.05	86.74	107	Nigeria.....	13.69	54.82
42	Denmark.....	4.05	86.73	108	Malawi.....	14.15	53.30
43	Viet Nam.....	4.06	86.70	109	Greece.....	14.22	53.06
44	Singapore.....	4.12	86.51	110	Yemen.....	14.79	51.19
45	Mexico.....	4.15	86.41	111	Burundi.....	14.83	51.05
46	Finland.....	4.18	86.32	112	Bosnia and Herzegovina.....	15.37	49.26
47	Luxembourg.....	4.25	86.09	113	Georgia.....	15.44	49.01
48	Ghana.....	4.56	85.04	114	Armenia.....	17.82	41.15
49	Canada.....	4.62	84.84	115	North Macedonia.....	17.82	41.14
50	Russian Federation.....	4.79	84.29	116	Senegal.....	17.83	41.12
51	Peru.....	4.81	84.23	117	Bhutan.....	18.27	39.65
52	El Salvador.....	4.98	83.65	118	Mali.....	18.52	38.83
53	Tanzania, United Rep.....	5.00	83.59	119	Iran, Islamic Rep.....	19.07	37.00
54	Dominican Republic.....	5.14	83.14	120	Albania.....	19.10	36.90
55	Uganda.....	5.22	82.87	121	Rwanda.....	19.54	35.45
56	Ecuador.....	5.28	82.68	122	Egypt.....	20.75	31.45
57	Costa Rica.....	5.33	82.49	123	Tunisia.....	30.25	0.00
58	Portugal.....	5.38	82.35		Algeria.....	n/a	n/a
59	France.....	5.42	82.19		China.....	n/a	n/a
60	Ethiopia.....	5.48	82.00		Jamaica.....	n/a	n/a
61	Indonesia.....	5.50	81.95		Jordan.....	n/a	n/a
62	Tajikistan.....	5.51	81.92		Korea, Rep.....	n/a	n/a
63	Azerbaijan.....	5.79	80.98		Kuwait.....	n/a	n/a
64	Italy.....	5.92	80.55		Lesotho.....	n/a	n/a
65	Bolivia, Plurinational St.....	6.01	80.25		Morocco.....	n/a	n/a
66	Croatia.....	6.03	80.20		Oman.....	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

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1.3.2 Active labour market policies

Average answer to the question: In your country, to what extent do labour market policies help unemployed people to reskill and find new employment (including skills matching, retraining, etc.)? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	5.75	100.00	67	Tanzania, United Rep.	3.18	39.04
2	United States of America.....	5.68	98.20	68	Armenia.....	3.18	38.86
3	Austria.....	5.65	97.59	69	Kenya.....	3.15	38.16
4	Singapore.....	5.61	96.73	70	Jordan.....	3.13	37.83
5	Luxembourg.....	5.38	91.11	71	Mali.....	3.10	37.05
6	Iceland.....	5.29	89.01	72	North Macedonia.....	3.09	36.78
7	Denmark.....	5.29	88.94	73	Croatia.....	3.09	36.75
8	Germany.....	5.20	86.99	74	Jamaica.....	3.09	36.74
9	Norway.....	5.17	86.15	75	Viet Nam.....	3.02	35.20
10	Netherlands.....	5.15	85.72	76	Tunisia.....	2.99	34.31
11	Malaysia.....	4.96	81.15	77	Sri Lanka.....	2.98	34.29
12	Finland.....	4.95	80.91	78	Trinidad and Tobago.....	2.98	34.08
13	Estonia.....	4.90	79.65	79	Chile.....	2.96	33.80
14	Sweden.....	4.83	78.14	80	Algeria.....	2.94	33.18
15	Ireland.....	4.79	77.12	81	Panama.....	2.93	32.99
16	Australia.....	4.78	76.85	82	Moldova, Rep.....	2.91	32.61
17	Czech Republic.....	4.78	76.80	83	Lao PDR.....	2.89	31.98
18	Malta.....	4.78	76.80	84	Greece.....	2.88	31.92
19	New Zealand.....	4.77	76.79	85	Iran, Islamic Rep.....	2.88	31.88
20	Qatar.....	4.74	75.92	86	Botswana.....	2.88	31.75
21	Canada.....	4.71	75.33	87	Cambodia.....	2.87	31.55
22	Japan.....	4.69	74.79	88	Georgia.....	2.85	31.18
23	Saudi Arabia.....	4.69	74.72	89	Colombia.....	2.83	30.66
24	Belgium.....	4.55	71.48	90	Namibia.....	2.83	30.55
25	Slovenia.....	4.55	71.47	91	Mongolia.....	2.82	30.45
26	United Arab Emirates.....	4.53	70.86	92	Kyrgyzstan.....	2.82	30.44
27	China.....	4.49	70.12	93	Nepal.....	2.82	30.33
28	Oman.....	4.49	69.94	94	Italy.....	2.81	30.19
29	Korea, Rep.....	4.48	69.76	95	Cabo Verde.....	2.80	29.84
30	France.....	4.45	69.14	96	Costa Rica.....	2.80	29.81
31	Israel.....	4.42	68.30	97	Argentina.....	2.78	29.42
32	India.....	4.40	67.79	98	Albania.....	2.69	27.24
33	Bahrain.....	4.38	67.33	99	Bosnia and Herzegovina.....	2.68	27.03
34	United Kingdom.....	4.20	63.15	100	Egypt.....	2.67	26.86
35	Azerbaijan.....	4.19	62.98	101	Liberia.....	2.66	26.65
36	Portugal.....	4.17	62.35	102	Brazil.....	2.66	26.54
37	Bhutan.....	4.15	61.90	103	South Africa.....	2.65	26.28
38	Indonesia.....	4.09	60.64	104	Bangladesh.....	2.61	25.28
39	Lithuania.....	4.07	60.09	105	Cameroon.....	2.55	23.97
40	Montenegro.....	4.02	58.94	106	Mexico.....	2.52	23.14
41	Kazakhstan.....	4.01	58.69	107	Senegal.....	2.49	22.63
42	Slovakia.....	3.99	58.26	108	Honduras.....	2.44	21.29
43	Cyprus.....	3.99	58.15	109	Eswatini.....	2.39	20.18
44	Pakistan.....	3.93	56.62	110	Burundi.....	2.38	20.01
45	Lesotho.....	3.91	56.18	111	Uganda.....	2.38	19.99
46	Latvia.....	3.90	56.13	112	Malawi.....	2.37	19.79
47	Tajikistan.....	3.85	54.93	113	Zambia.....	2.25	16.82
48	Brunei Darussalam.....	3.83	54.38	114	Paraguay.....	2.17	14.93
49	Uruguay.....	3.79	53.31	115	Dominican Republic.....	2.14	14.21
50	Romania.....	3.73	52.04	116	Nigeria.....	2.13	14.04
51	Thailand.....	3.72	51.73	117	Ecuador.....	2.12	13.85
52	Mauritius.....	3.72	51.72	118	Morocco.....	2.12	13.80
53	Russian Federation.....	3.70	51.27	119	Madagascar.....	2.10	13.18
54	Turkey.....	3.68	50.78	120	Guatemala.....	2.08	12.77
55	Philippines.....	3.65	50.00	121	Peru.....	2.07	12.66
56	Kuwait.....	3.62	49.46	122	Mozambique.....	2.05	12.10
57	Ukraine.....	3.59	48.54	123	Côte d'Ivoire.....	2.03	11.70
58	Ghana.....	3.58	48.38	124	Burkina Faso.....	1.88	8.12
59	Rwanda.....	3.58	48.34	125	Congo, Dem. Rep.....	1.85	7.40
60	Spain.....	3.55	47.65	126	Yemen.....	1.83	6.98
61	Hungary.....	3.48	46.15	127	Bolivia, Plurinational St.....	1.83	6.80
62	Poland.....	3.46	45.46	128	Venezuela, Bolivarian Rep.....	1.71	4.02
63	Bulgaria.....	3.44	44.98	129	Nicaragua.....	1.69	3.47
64	Ethiopia.....	3.39	43.80	130	Zimbabwe.....	1.65	2.52
65	Gambia.....	3.35	42.85	131	El Salvador.....	1.63	2.07
66	Serbia.....	3.28	41.37	132	Angola.....	1.54	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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1.3.3 Labour-employer cooperation

Average answer to the question: In your country, how would you characterise labour-employer relations? [1 = generally confrontational; 7 = generally cooperative] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.15	100.00	67	Moldova, Rep.....	4.35	38.26
2	Singapore.....	6.11	98.83	68	Slovakia.....	4.34	37.96
3	Netherlands.....	5.86	90.05	69	Kenya.....	4.34	37.95
4	Denmark.....	5.84	89.37	70	Egypt.....	4.33	37.52
5	Japan.....	5.75	86.21	71	Sri Lanka.....	4.32	37.20
6	United States of America.....	5.73	85.86	72	Tajikistan.....	4.31	36.81
7	Luxembourg.....	5.65	83.05	73	Ecuador.....	4.30	36.69
8	Norway.....	5.65	82.96	74	Montenegro.....	4.28	36.06
9	Sweden.....	5.58	80.49	75	Poland.....	4.27	35.63
10	Austria.....	5.49	77.42	76	Ukraine.....	4.27	35.50
11	Iceland.....	5.45	76.00	77	Botswana.....	4.27	35.44
12	New Zealand.....	5.43	75.50	78	Panama.....	4.26	35.22
13	Oman.....	5.42	74.99	79	Russian Federation.....	4.25	34.95
14	Malaysia.....	5.39	74.04	80	Mongolia.....	4.25	34.76
15	Finland.....	5.26	69.44	81	Tanzania, United Rep.....	4.23	34.34
16	United Arab Emirates.....	5.21	67.80	82	Hungary.....	4.22	33.93
17	Canada.....	5.20	67.52	83	Bangladesh.....	4.22	33.92
18	Bahrain.....	5.20	67.44	84	Spain.....	4.22	33.78
19	Germany.....	5.19	67.15	85	Senegal.....	4.21	33.39
20	Ireland.....	5.16	66.15	86	Georgia.....	4.21	33.38
21	Costa Rica.....	5.13	65.23	87	Cabo Verde.....	4.18	32.55
22	Philippines.....	5.13	65.00	88	Viet Nam.....	4.17	32.17
23	Estonia.....	5.12	64.67	89	Paraguay.....	4.15	31.58
24	Malta.....	5.10	64.22	90	Madagascar.....	4.11	30.12
25	Israel.....	5.10	64.00	91	Kyrgyzstan.....	4.09	29.38
26	Qatar.....	5.09	63.83	92	Zimbabwe.....	4.06	28.46
27	United Kingdom.....	5.09	63.64	93	Burundi.....	4.06	28.43
28	Bhutan.....	5.05	62.37	94	France.....	4.06	28.35
29	Guatemala.....	5.01	61.04	95	Serbia.....	4.05	28.21
30	Rwanda.....	4.93	58.34	96	Algeria.....	4.05	27.93
31	Azerbaijan.....	4.90	57.35	97	Peru.....	4.04	27.77
32	Brunei Darussalam.....	4.89	56.75	98	Burkina Faso.....	4.01	26.81
33	Albania.....	4.85	55.56	99	El Salvador.....	4.01	26.70
34	Thailand.....	4.85	55.45	100	Greece.....	4.01	26.57
35	Cyprus.....	4.80	53.71	101	Liberia.....	3.98	25.53
36	Gambia.....	4.76	52.38	102	Cameroon.....	3.94	24.40
37	Czech Republic.....	4.76	52.30	103	Pakistan.....	3.93	24.04
38	Saudi Arabia.....	4.76	52.25	104	Morocco.....	3.92	23.69
39	Jordan.....	4.74	51.72	105	Eswatini.....	3.92	23.47
40	Armenia.....	4.74	51.65	106	Malawi.....	3.90	22.98
41	Latvia.....	4.72	51.14	107	Nigeria.....	3.88	22.29
42	Honduras.....	4.72	51.02	108	Turkey.....	3.87	21.93
43	Mauritius.....	4.72	50.87	109	Italy.....	3.86	21.63
44	India.....	4.71	50.77	110	Zambia.....	3.82	20.04
45	Côte d'Ivoire.....	4.63	48.06	111	Yemen.....	3.81	19.75
46	Belgium.....	4.63	47.88	112	Brazil.....	3.80	19.32
47	Lithuania.....	4.62	47.53	113	Bulgaria.....	3.78	18.62
48	Portugal.....	4.61	47.24	114	Mali.....	3.76	17.99
49	Indonesia.....	4.61	47.21	115	Ethiopia.....	3.75	17.75
50	Nicaragua.....	4.58	46.24	116	Tunisia.....	3.71	16.34
51	China.....	4.58	46.17	117	Argentina.....	3.67	15.14
52	Lao PDR.....	4.55	45.25	118	Iran, Islamic Rep.....	3.62	13.13
53	Slovenia.....	4.48	42.78	119	Korea, Rep.....	3.61	13.03
54	Kuwait.....	4.47	42.59	120	North Macedonia.....	3.55	11.04
55	Namibia.....	4.47	42.36	121	Bosnia and Herzegovina.....	3.55	10.86
56	Jamaica.....	4.44	41.59	122	Venezuela, Bolivarian Rep.....	3.55	10.85
57	Cambodia.....	4.42	40.84	123	Mozambique.....	3.55	10.77
58	Mexico.....	4.42	40.84	124	Bolivia, Plurinational St.....	3.54	10.49
59	Ghana.....	4.42	40.66	125	Angola.....	3.50	9.02
60	Dominican Republic.....	4.40	40.08	126	Congo, Dem. Rep.....	3.49	8.69
61	Uganda.....	4.39	39.66	127	Nepal.....	3.48	8.53
62	Chile.....	4.38	39.22	128	South Africa.....	3.34	3.62
63	Australia.....	4.38	39.21	129	Lesotho.....	3.32	3.13
64	Kazakhstan.....	4.36	38.82	130	Uruguay.....	3.31	2.61
65	Romania.....	4.36	38.81	131	Croatia.....	3.24	0.30
66	Colombia.....	4.35	38.35	132	Trinidad and Tobago.....	3.23	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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1.3.4 Professional management

Average answer to the question: In your country, who holds senior management positions in companies? [1 = usually relatives or friends without regard to merit; 7 = mostly professional managers chosen for merit and qualifications] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Finland.....	6.20	100.00	67	South Africa.....	4.20	48.20
2	Netherlands.....	6.18	99.52	68	Georgia.....	4.19	48.12
3	Singapore.....	6.10	97.40	69	Panama.....	4.19	47.88
4	Switzerland.....	6.08	96.76	70	Albania.....	4.18	47.62
5	Australia.....	6.04	95.83	71	Honduras.....	4.17	47.60
6	New Zealand.....	6.01	94.95	72	Poland.....	4.13	46.57
7	Sweden.....	5.95	93.43	73	Liberia.....	4.13	46.43
8	Ireland.....	5.95	93.42	74	Turkey.....	4.13	46.36
9	Denmark.....	5.93	92.99	75	Venezuela, Bolivarian Rep.....	4.10	45.72
10	Canada.....	5.91	92.40	76	Tanzania, United Rep.....	4.10	45.65
11	United States of America.....	5.87	91.54	77	Colombia.....	4.10	45.57
12	United Kingdom.....	5.79	89.28	78	Brunei Darussalam.....	4.08	45.21
13	Luxembourg.....	5.77	88.74	79	Malawi.....	4.08	45.07
14	Belgium.....	5.71	87.20	80	Peru.....	4.06	44.75
15	Norway.....	5.63	85.35	81	Egypt.....	4.05	44.38
16	Japan.....	5.61	84.69	82	Côte d'Ivoire.....	4.00	43.09
17	Malaysia.....	5.57	83.63	83	Greece.....	4.00	42.99
18	Israel.....	5.50	81.97	84	Uganda.....	3.96	42.17
19	Iceland.....	5.49	81.68	85	Jordan.....	3.96	42.06
20	Austria.....	5.48	81.47	86	Mongolia.....	3.93	41.34
21	Germany.....	5.42	79.89	87	Tunisia.....	3.93	41.18
22	Czech Republic.....	5.37	78.63	88	Montenegro.....	3.92	40.90
23	France.....	5.33	77.38	89	Bangladesh.....	3.91	40.70
24	United Arab Emirates.....	5.25	75.54	90	Dominican Republic.....	3.89	40.38
25	Qatar.....	5.24	75.11	91	Lao PDR.....	3.89	40.17
26	Estonia.....	5.21	74.37	92	Russian Federation.....	3.88	40.09
27	Oman.....	5.07	70.74	93	Pakistan.....	3.85	39.25
28	Chile.....	4.98	68.38	94	Hungary.....	3.81	38.17
29	Philippines.....	4.92	66.91	95	Zambia.....	3.80	38.00
30	Jamaica.....	4.92	66.84	96	Cambodia.....	3.79	37.59
31	India.....	4.89	66.19	97	Italy.....	3.75	36.57
32	Gambia.....	4.89	66.14	98	Cyprus.....	3.73	36.22
33	Costa Rica.....	4.87	65.63	99	Kazakhstan.....	3.72	35.84
34	Lithuania.....	4.84	64.81	100	Moldova, Rep.....	3.66	34.23
35	Ghana.....	4.80	63.70	101	Senegal.....	3.62	33.20
36	Bahrain.....	4.79	63.54	102	Cabo Verde.....	3.62	33.19
37	Malta.....	4.76	62.78	103	Romania.....	3.60	32.87
38	Rwanda.....	4.75	62.58	104	Madagascar.....	3.60	32.78
39	Zimbabwe.....	4.74	62.34	105	Kuwait.....	3.58	32.35
40	Indonesia.....	4.64	59.72	106	Ukraine.....	3.58	32.13
41	Saudi Arabia.....	4.60	58.62	107	Ethiopia.....	3.57	32.07
42	Spain.....	4.58	58.17	108	El Salvador.....	3.55	31.50
43	Azerbaijan.....	4.58	58.06	109	Bulgaria.....	3.53	30.85
44	China.....	4.54	57.11	110	Nepal.....	3.49	29.96
45	Botswana.....	4.54	57.10	111	Cameroon.....	3.49	29.91
46	Trinidad and Tobago.....	4.54	57.10	112	Paraguay.....	3.47	29.44
47	Slovakia.....	4.52	56.64	113	Burundi.....	3.46	29.16
48	Kenya.....	4.52	56.42	114	Ecuador.....	3.45	28.80
49	Thailand.....	4.51	56.38	115	Nicaragua.....	3.43	28.42
50	Eswatini.....	4.51	56.15	116	North Macedonia.....	3.42	28.18
51	Latvia.....	4.50	55.95	117	Tajikistan.....	3.42	28.12
52	Mauritius.....	4.48	55.41	118	Serbia.....	3.42	28.11
53	Bhutan.....	4.46	55.07	119	Mali.....	3.39	27.25
54	Sri Lanka.....	4.46	54.93	120	Viet Nam.....	3.37	26.84
55	Namibia.....	4.43	54.21	121	Croatia.....	3.36	26.46
56	Nigeria.....	4.42	53.93	122	Lesotho.....	3.34	26.01
57	Brazil.....	4.40	53.56	123	Bolivia, Plurinational St.....	3.26	24.07
58	Argentina.....	4.40	53.40	124	Kyrgyzstan.....	3.25	23.60
59	Portugal.....	4.37	52.67	125	Iran, Islamic Rep.....	3.23	23.14
60	Korea, Rep.....	4.36	52.28	126	Congo, Dem. Rep.....	3.22	23.03
61	Guatemala.....	4.32	51.49	127	Bosnia and Herzegovina.....	3.12	20.46
62	Slovenia.....	4.31	51.20	128	Mozambique.....	3.12	20.31
63	Armenia.....	4.26	49.86	129	Burkina Faso.....	2.96	16.14
64	Uruguay.....	4.26	49.78	130	Algeria.....	2.95	15.97
65	Morocco.....	4.23	48.99	131	Yemen.....	2.46	3.30
66	Mexico.....	4.23	48.98	132	Angola.....	2.33	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.3.5 Relationship of pay to productivity

Average answer to the question: In your country, to what extent is pay related to employee productivity? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	5.75	100.00	67	Montenegro.....	3.93	48.95
2	Switzerland.....	5.59	95.38	68	Moldova, Rep.....	3.91	48.56
3	Singapore.....	5.45	91.59	69	Trinidad and Tobago.....	3.88	47.73
4	Malaysia.....	5.30	87.37	70	Cyprus.....	3.84	46.46
5	Germany.....	5.27	86.43	71	Honduras.....	3.84	46.42
6	United Arab Emirates.....	5.21	84.76	72	Egypt.....	3.83	46.16
7	Canada.....	4.99	78.61	73	Sri Lanka.....	3.82	45.92
8	Denmark.....	4.96	77.95	74	Brunei Darussalam.....	3.81	45.60
9	Qatar.....	4.93	77.15	75	Bangladesh.....	3.81	45.56
10	Philippines.....	4.93	76.92	76	Ethiopia.....	3.80	45.30
11	Ireland.....	4.90	76.05	77	Eswatini.....	3.77	44.44
12	Netherlands.....	4.85	74.91	78	Bulgaria.....	3.74	43.57
13	United Kingdom.....	4.84	74.58	79	Mexico.....	3.71	42.77
14	Azerbaijan.....	4.81	73.56	80	Jamaica.....	3.69	42.40
15	Korea, Rep.....	4.80	73.45	81	Kuwait.....	3.68	42.13
16	New Zealand.....	4.75	71.92	82	Georgia.....	3.68	41.96
17	Indonesia.....	4.74	71.76	83	Liberia.....	3.67	41.77
18	Bahrain.....	4.71	70.93	84	Morocco.....	3.64	41.02
19	Luxembourg.....	4.70	70.48	85	Nigeria.....	3.64	40.94
20	Estonia.....	4.67	69.81	86	North Macedonia.....	3.64	40.78
21	Israel.....	4.67	69.64	87	Ecuador.....	3.63	40.53
22	India.....	4.66	69.40	88	South Africa.....	3.61	40.06
23	Saudi Arabia.....	4.64	69.01	89	Zambia.....	3.56	38.74
24	Finland.....	4.64	68.82	90	Hungary.....	3.56	38.67
25	Iceland.....	4.63	68.69	91	Mongolia.....	3.56	38.61
26	China.....	4.63	68.62	92	Turkey.....	3.55	38.40
27	Austria.....	4.59	67.55	93	Peru.....	3.55	38.36
28	Australia.....	4.59	67.49	94	Colombia.....	3.55	38.29
29	Sweden.....	4.57	66.95	95	Dominican Republic.....	3.54	37.98
30	Tajikistan.....	4.53	65.85	96	Malawi.....	3.53	37.93
31	Japan.....	4.53	65.84	97	Botswana.....	3.51	37.26
32	Czech Republic.....	4.53	65.77	98	Tanzania, United Rep.....	3.49	36.75
33	Norway.....	4.53	65.73	99	Spain.....	3.49	36.62
34	Thailand.....	4.52	65.62	100	Cabo Verde.....	3.48	36.50
35	Russian Federation.....	4.46	63.88	101	Uganda.....	3.48	36.42
36	Albania.....	4.46	63.88	102	Iran, Islamic Rep.....	3.48	36.38
37	Kenya.....	4.46	63.79	103	Nepal.....	3.46	35.90
38	Lithuania.....	4.45	63.53	104	Lesotho.....	3.45	35.70
39	Oman.....	4.44	63.18	105	Romania.....	3.45	35.46
40	Gambia.....	4.43	63.06	106	Algeria.....	3.44	35.33
41	Malta.....	4.41	62.49	107	Mali.....	3.43	35.08
42	Chile.....	4.41	62.41	108	Greece.....	3.43	35.05
43	Belgium.....	4.41	62.32	109	Senegal.....	3.37	33.46
44	Latvia.....	4.37	61.34	110	Brazil.....	3.37	33.33
45	Bhutan.....	4.30	59.41	111	Croatia.....	3.34	32.58
46	Slovakia.....	4.30	59.40	112	Paraguay.....	3.34	32.56
47	Kazakhstan.....	4.25	58.01	113	Argentina.....	3.33	32.24
48	Lao PDR.....	4.25	58.00	114	Madagascar.....	3.31	31.60
49	Jordan.....	4.22	57.21	115	Nicaragua.....	3.31	31.57
50	Costa Rica.....	4.22	57.18	116	Uruguay.....	3.30	31.46
51	Ukraine.....	4.20	56.49	117	Côte d'Ivoire.....	3.28	30.67
52	Kyrgyzstan.....	4.17	55.63	118	Panama.....	3.27	30.56
53	Cambodia.....	4.13	54.55	119	Cameroon.....	3.26	30.29
54	Poland.....	4.12	54.41	120	Zimbabwe.....	3.24	29.57
55	Armenia.....	4.11	54.13	121	Tunisia.....	3.21	28.78
56	Rwanda.....	4.09	53.40	122	Yemen.....	3.14	26.86
57	Serbia.....	4.08	53.28	123	El Salvador.....	3.12	26.20
58	Ghana.....	4.08	53.22	124	Italy.....	3.10	25.81
59	Pakistan.....	4.04	52.04	125	Burundi.....	3.04	24.03
60	Slovenia.....	3.98	50.37	126	Bosnia and Herzegovina.....	3.02	23.57
61	Guatemala.....	3.97	50.19	127	Bolivia, Plurinational St.....	2.78	16.92
62	Namibia.....	3.97	50.00	128	Burkina Faso.....	2.77	16.65
63	Viet Nam.....	3.94	49.42	129	Mozambique.....	2.76	16.25
64	Portugal.....	3.94	49.24	130	Congo, Dem. Rep.....	2.44	7.15
65	France.....	3.93	49.01	131	Angola.....	2.35	4.62
66	Mauritius.....	3.93	48.96	132	Venezuela, Bolivarian Rep.....	2.18	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

1.3.6 Technology utilisation

Average answer to the question: In your country, to what extent do businesses adopt the latest technologies? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	6.01	100.00	67	Dominican Republic.....	4.43	50.03
2	Sweden.....	5.97	98.63	68	Hungary.....	4.40	48.83
3	Switzerland.....	5.89	96.15	69	Armenia.....	4.39	48.58
4	Iceland.....	5.89	96.05	70	Bulgaria.....	4.39	48.58
5	Israel.....	5.88	95.65	71	Uruguay.....	4.37	48.11
6	Finland.....	5.82	93.73	72	Pakistan.....	4.32	46.59
7	Netherlands.....	5.77	92.40	73	Namibia.....	4.32	46.50
8	Denmark.....	5.75	91.77	74	Ecuador.....	4.32	46.44
9	Luxembourg.....	5.66	88.90	75	Montenegro.....	4.32	46.36
10	Germany.....	5.58	86.41	76	Brunei Darussalam.....	4.31	46.25
11	Japan.....	5.58	86.16	77	Trinidad and Tobago.....	4.31	46.17
12	Singapore.....	5.54	85.04	78	Egypt.....	4.31	46.09
13	United Kingdom.....	5.51	84.12	79	Colombia.....	4.30	45.74
14	Malaysia.....	5.51	84.09	80	Bangladesh.....	4.29	45.43
15	Norway.....	5.46	82.39	81	Albania.....	4.27	44.87
16	New Zealand.....	5.37	79.62	82	Croatia.....	4.27	44.79
17	Ireland.....	5.35	79.12	83	Madagascar.....	4.25	44.29
18	United Arab Emirates.....	5.35	78.92	84	Greece.....	4.25	44.22
19	Lithuania.....	5.32	78.08	85	Ghana.....	4.24	44.06
20	Austria.....	5.29	77.21	86	Argentina.....	4.24	44.03
21	Korea, Rep.....	5.28	76.83	87	Kazakhstan.....	4.23	43.48
22	Canada.....	5.28	76.74	88	Mongolia.....	4.23	43.44
23	Estonia.....	5.28	76.64	89	Cabo Verde.....	4.22	43.37
24	Portugal.....	5.26	76.21	90	Nigeria.....	4.19	42.41
25	Australia.....	5.25	75.91	91	Ukraine.....	4.19	42.28
26	Saudi Arabia.....	5.25	75.86	92	Tajikistan.....	4.17	41.59
27	France.....	5.19	73.86	93	Sri Lanka.....	4.15	41.21
28	Belgium.....	5.18	73.73	94	Cambodia.....	4.15	41.07
29	Indonesia.....	5.18	73.64	95	Peru.....	4.15	40.97
30	Malta.....	5.15	72.70	96	Bhutan.....	4.14	40.89
31	Bahrain.....	5.08	70.44	97	Lao PDR.....	4.12	40.00
32	Kenya.....	5.07	70.07	98	Serbia.....	4.11	39.74
33	Qatar.....	5.06	69.73	99	Tanzania, United Rep.....	4.09	39.07
34	Czech Republic.....	4.99	67.76	100	Paraguay.....	4.08	38.89
35	Latvia.....	4.99	67.45	101	Moldova, Rep.....	4.07	38.40
36	Guatemala.....	4.97	66.96	102	Viet Nam.....	4.05	38.03
37	Chile.....	4.97	66.95	103	Romania.....	4.04	37.49
38	Slovakia.....	4.94	65.97	104	Botswana.....	4.02	36.97
39	Philippines.....	4.93	65.86	105	Bosnia and Herzegovina.....	4.02	36.85
40	Slovenia.....	4.92	65.55	106	Georgia.....	4.01	36.65
41	Costa Rica.....	4.92	65.53	107	Tunisia.....	3.99	36.16
42	South Africa.....	4.91	65.15	108	El Salvador.....	3.99	35.90
43	Senegal.....	4.91	65.02	109	Uganda.....	3.97	35.29
44	Azerbaijan.....	4.88	64.06	110	Mali.....	3.93	34.26
45	Jordan.....	4.88	64.02	111	North Macedonia.....	3.90	33.16
46	Thailand.....	4.85	63.17	112	Cameroon.....	3.86	31.79
47	Spain.....	4.82	62.27	113	Zambia.....	3.85	31.59
48	Oman.....	4.78	61.08	114	Nicaragua.....	3.84	31.29
49	Panama.....	4.75	59.96	115	Zimbabwe.....	3.74	28.02
50	India.....	4.74	59.61	116	Mozambique.....	3.72	27.61
51	Cyprus.....	4.70	58.34	117	Iran, Islamic Rep.....	3.72	27.54
52	Mexico.....	4.69	58.16	118	Algeria.....	3.68	26.37
53	Mauritius.....	4.68	57.67	119	Burkina Faso.....	3.67	25.79
54	Côte d'Ivoire.....	4.62	56.04	120	Nepal.....	3.66	25.63
55	Honduras.....	4.62	55.87	121	Bolivia, Plurinational St.....	3.62	24.40
56	China.....	4.56	54.03	122	Eswatini.....	3.59	23.43
57	Brazil.....	4.54	53.43	123	Venezuela, Bolivarian Rep.....	3.48	19.85
58	Jamaica.....	4.54	53.41	124	Malawi.....	3.39	17.15
59	Italy.....	4.54	53.33	125	Kyrgyzstan.....	3.37	16.39
60	Morocco.....	4.53	53.23	126	Ethiopia.....	3.29	13.80
61	Poland.....	4.53	53.14	127	Congo, Dem. Rep.....	3.27	13.38
62	Russian Federation.....	4.53	52.97	128	Liberia.....	3.25	12.64
63	Rwanda.....	4.52	52.91	129	Angola.....	3.07	6.84
64	Kuwait.....	4.52	52.84	130	Lesotho.....	2.94	2.77
65	Turkey.....	4.49	51.73	131	Burundi.....	2.90	1.54
66	Gambia.....	4.48	51.64	132	Yemen.....	2.85	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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1.3.7 Investment in emerging technologies

Average answer to the question: In your country, to what extent do companies invest in emerging technologies (e.g Internet of Things, advanced analytics and artificial intelligence, augmented virtual reality and wearables, advanced robotics, 3D printing)? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	6.00	100.00	67	Sri Lanka.....	3.53	38.35
2	Israel	5.85	96.21	68	Jamaica.....	3.52	38.07
3	Sweden	5.68	91.97	69	Guatemala.....	3.50	37.54
4	Switzerland.....	5.57	89.43	70	Poland.....	3.49	37.21
5	Netherlands.....	5.51	87.95	71	Egypt.....	3.48	37.05
6	Finland.....	5.51	87.87	72	Kazakhstan.....	3.48	37.04
7	Germany.....	5.47	86.85	73	Gambia.....	3.45	36.20
8	United Kingdom	5.29	82.43	74	Uganda.....	3.44	36.03
9	Japan.....	5.20	79.99	75	Honduras	3.43	35.90
10	Luxembourg	5.18	79.58	76	Lesotho.....	3.43	35.86
11	United Arab Emirates.....	5.18	79.57	77	Bhutan.....	3.43	35.83
12	Malaysia.....	5.15	78.89	78	Tunisia.....	3.42	35.63
13	Singapore.....	5.14	78.60	79	Mauritius.....	3.40	34.96
14	Denmark.....	5.07	76.91	80	Morocco.....	3.40	34.94
15	Norway.....	4.94	73.55	81	Namibia.....	3.39	34.86
16	Qatar.....	4.84	71.18	82	Argentina.....	3.38	34.66
17	Ireland	4.82	70.53	83	Cabo Verde.....	3.36	34.06
18	New Zealand	4.74	68.51	84	Algeria.....	3.36	33.92
19	Canada.....	4.73	68.25	85	Madagascar.....	3.35	33.88
20	Belgium.....	4.70	67.50	86	Montenegro.....	3.34	33.65
21	France.....	4.69	67.30	87	Cameroon.....	3.33	33.24
22	Azerbaijan.....	4.68	67.18	88	Mali.....	3.33	33.17
23	Australia	4.63	65.76	89	Mongolia.....	3.32	32.94
24	Iceland	4.63	65.70	90	Zambia.....	3.25	31.39
25	Austria.....	4.57	64.42	91	Cyprus	3.25	31.37
26	India.....	4.57	64.29	92	Serbia.....	3.25	31.34
27	Indonesia.....	4.51	62.78	93	Romania.....	3.25	31.16
28	Lithuania.....	4.47	61.76	94	Botswana.....	3.23	30.84
29	Saudi Arabia.....	4.46	61.52	95	Georgia.....	3.20	29.90
30	Philippines.....	4.44	61.10	96	Dominican Republic.....	3.16	29.14
31	Kenya.....	4.40	60.12	97	Bangladesh.....	3.16	29.07
32	China.....	4.39	59.71	98	Côte d'Ivoire.....	3.14	28.47
33	Korea, Rep.....	4.38	59.48	99	Hungary.....	3.13	28.34
34	Estonia	4.35	58.91	100	Ethiopia.....	3.13	28.27
35	Czech Republic.....	4.20	55.17	101	Iran, Islamic Rep.....	3.11	27.77
36	Thailand	4.18	54.44	102	Turkey.....	3.10	27.62
37	Malta	4.14	53.67	103	Uruguay	3.08	26.97
38	Portugal	4.11	52.88	104	Nepal.....	3.05	26.30
39	South Africa.....	4.07	51.83	105	Mozambique.....	3.04	26.00
40	Slovenia.....	4.06	51.61	106	Croatia.....	3.01	25.34
41	Rwanda.....	4.00	50.02	107	Peru.....	3.01	25.15
42	Oman.....	4.00	50.01	108	Burkina Faso.....	2.96	23.92
43	Slovakia	3.97	49.41	109	Greece.....	2.94	23.53
44	Ghana.....	3.97	49.40	110	Burundi.....	2.94	23.48
45	Jordan.....	3.97	49.20	111	Ecuador.....	2.93	23.33
46	Russian Federation.....	3.95	48.90	112	Brunei Darussalam.....	2.93	23.20
47	Costa Rica.....	3.93	48.38	113	Nigeria.....	2.91	22.87
48	Pakistan.....	3.93	48.24	114	Liberia.....	2.91	22.71
49	Bulgaria.....	3.86	46.61	115	Trinidad and Tobago.....	2.89	22.32
50	Lao PDR.....	3.85	46.40	116	Albania.....	2.87	21.88
51	Armenia.....	3.85	46.26	117	Malawi.....	2.79	19.79
52	Latvia.....	3.79	44.86	118	Moldova, Rep.....	2.78	19.51
53	Cambodia.....	3.75	43.85	119	Kyrgyzstan.....	2.77	19.32
54	Spain.....	3.72	43.01	120	Paraguay.....	2.76	19.09
55	Kuwait.....	3.70	42.57	121	El Salvador.....	2.76	18.90
56	Tajikistan.....	3.67	41.88	122	Congo, Dem. Rep.....	2.70	17.50
57	Tanzania, United Rep.....	3.66	41.64	123	North Macedonia.....	2.70	17.45
58	Senegal.....	3.65	41.21	124	Bosnia and Herzegovina.....	2.68	16.99
59	Italy.....	3.64	41.08	125	Nicaragua.....	2.53	13.37
60	Ukraine.....	3.62	40.56	126	Zimbabwe.....	2.49	12.22
61	Panama.....	3.61	40.39	127	Bolivia, Plurinational St.....	2.48	12.03
62	Mexico.....	3.59	39.74	128	Eswatini.....	2.47	11.76
63	Brazil.....	3.56	38.96	129	Venezuela, Bolivarian Rep.....	2.43	10.78
64	Colombia.....	3.55	38.85	130	Yemen.....	2.31	7.80
65	Viet Nam.....	3.54	38.57	131	Angola.....	2.00	0.00
66	Chile.....	3.54	38.42		Bahrain.....	n/a	n/a

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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1.3.8 Robot density

Number of robots in operation per 10,000 employees in the manufacturing industry | 2019

Rank	Country	Value*	Score	Rank	Country	Value	Score
1	Germany.....	—	100.00	67	Venezuela, Bolivarian Rep.....	—	0.03
1	Korea, Rep.....	—	100.00	68	Pakistan.....	—	0.00
1	Singapore.....	—	100.00		Albania.....	n/a	n/a
4	Japan.....	—	96.78		Algeria.....	n/a	n/a
5	Sweden.....	—	72.93		Angola.....	n/a	n/a
6	Denmark.....	—	70.85		Armenia.....	n/a	n/a
7	United States of America.....	—	64.06		Azerbaijan.....	n/a	n/a
8	Italy.....	—	59.11		Bahrain.....	n/a	n/a
9	Belgium.....	—	55.75		Bangladesh.....	n/a	n/a
10	Netherlands.....	—	53.69		Bhutan.....	n/a	n/a
11	Austria.....	—	51.73		Bolivia, Plurinational St.....	n/a	n/a
12	Slovenia.....	—	51.53		Botswana.....	n/a	n/a
13	Canada.....	—	50.86		Brunei Darussalam.....	n/a	n/a
14	Spain.....	—	49.72		Burkina Faso.....	n/a	n/a
15	Slovakia.....	—	48.76		Burundi.....	n/a	n/a
16	France.....	—	45.52		Cabo Verde.....	n/a	n/a
17	Switzerland.....	—	43.32		Cambodia.....	n/a	n/a
18	Finland.....	—	41.52		Cameroon.....	n/a	n/a
19	Czech Republic.....	—	40.05		Congo, Dem. Rep.....	n/a	n/a
20	China.....	—	39.65		Costa Rica.....	n/a	n/a
21	United Kingdom.....	—	26.94		Côte d'Ivoire.....	n/a	n/a
22	Hungary.....	—	24.95		Cyprus.....	n/a	n/a
23	Australia.....	—	21.92		Dominican Republic.....	n/a	n/a
24	Portugal.....	—	20.21		Ecuador.....	n/a	n/a
25	Norway.....	—	16.47		El Salvador.....	n/a	n/a
26	Malaysia.....	—	15.32		Eswatini.....	n/a	n/a
27	Thailand.....	—	15.19		Ethiopia.....	n/a	n/a
28	New Zealand.....	—	14.42		Gambia.....	n/a	n/a
29	Israel.....	—	13.65		Georgia.....	n/a	n/a
30	Poland.....	—	12.54		Ghana.....	n/a	n/a
31	Ireland.....	—	12.16		Guatemala.....	n/a	n/a
32	Mexico.....	—	12.04		Honduras.....	n/a	n/a
33	Malta.....	—	11.58		Jamaica.....	n/a	n/a
34	Turkey.....	—	8.83		Jordan.....	n/a	n/a
35	South Africa.....	—	7.36		Kazakhstan.....	n/a	n/a
36	Greece.....	—	6.74		Kenya.....	n/a	n/a
37	Romania.....	—	6.25		Kyrgyzstan.....	n/a	n/a
38	Iceland.....	—	6.06		Lao PDR.....	n/a	n/a
39	Estonia.....	—	5.63		Lesotho.....	n/a	n/a
40	Argentina.....	—	5.17		Liberia.....	n/a	n/a
41	Viet Nam.....	—	4.36		Luxembourg.....	n/a	n/a
42	Brazil.....	—	4.01		Madagascar.....	n/a	n/a
43	Lithuania.....	—	3.88		Malawi.....	n/a	n/a
44	Bulgaria.....	—	2.34		Mali.....	n/a	n/a
45	Croatia.....	—	2.01		Mauritius.....	n/a	n/a
46	Indonesia.....	—	1.56		Mongolia.....	n/a	n/a
47	Latvia.....	—	1.45		Montenegro.....	n/a	n/a
48	Russian Federation.....	—	1.42		Mozambique.....	n/a	n/a
49	Morocco.....	—	1.40		Namibia.....	n/a	n/a
50	Philippines.....	—	1.18		Nepal.....	n/a	n/a
51	India.....	—	1.09		Nicaragua.....	n/a	n/a
52	Serbia.....	—	0.99		Nigeria.....	n/a	n/a
53	Tunisia.....	—	0.95		North Macedonia.....	n/a	n/a
54	United Arab Emirates.....	—	0.90		Panama.....	n/a	n/a
55	Ukraine.....	—	0.74		Paraguay.....	n/a	n/a
56	Chile.....	—	0.70		Rwanda.....	n/a	n/a
57	Bosnia and Herzegovina.....	—	0.55		Senegal.....	n/a	n/a
58	Saudi Arabia.....	—	0.47		Sri Lanka.....	n/a	n/a
59	Egypt.....	—	0.22		Tajikistan.....	n/a	n/a
60	Colombia.....	—	0.19		Tanzania, United Rep.....	n/a	n/a
61	Peru.....	—	0.19		Trinidad and Tobago.....	n/a	n/a
62	Oman.....	—	0.14		Uganda.....	n/a	n/a
63	Iran, Islamic Rep.....	—	0.12		Uruguay.....	n/a	n/a
64	Moldova, Rep.....	—	0.10		Yemen.....	n/a	n/a
65	Qatar.....	—	0.10		Zambia.....	n/a	n/a
66	Kuwait.....	—	0.04		Zimbabwe.....	n/a	n/a

SOURCE: Data on robot density and operational stock of industrial robots for 2019 kindly provided by the International Federation of Robotics (IFR, <https://ifr.org>). Data on employment in manufacturing in the countries for which IFR has not computed robot densities are sourced from the International Labour Organization, ILOSTAT (<https://ilostat.ilo.org/>). For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

*Confidential data.

Pillar 2

Attract

2.1.1 FDI and technology transfer

Average answer to the question: To what extent does foreign direct investment (FDI) bring new technology into your country? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Ireland	6.11	100.00	67	Colombia	4.34	56.46
2	Singapore	5.94	95.97	68	Guatemala	4.33	56.20
3	United States of America	5.92	95.43	69	Mauritius	4.32	56.16
4	Luxembourg	5.76	91.33	70	Trinidad and Tobago	4.32	56.14
5	Israel	5.65	88.72	71	Senegal	4.29	55.23
6	United Kingdom	5.59	87.19	72	Turkey	4.26	54.51
7	Malta	5.53	85.75	73	Pakistan	4.24	54.17
8	Netherlands	5.51	85.23	74	Rwanda	4.24	54.15
9	Malaysia	5.50	84.98	75	Namibia	4.24	54.09
10	Sweden	5.46	84.12	76	Ghana	4.24	54.06
11	Germany	5.44	83.51	77	Côte d'Ivoire	4.23	53.74
12	Switzerland	5.42	83.21	78	Cabo Verde	4.21	53.26
13	Denmark	5.41	82.89	79	Brunei Darussalam	4.18	52.68
14	Japan	5.40	82.67	80	Italy	4.17	52.30
15	United Arab Emirates	5.35	81.39	81	Nicaragua	4.16	52.07
16	Portugal	5.33	81.00	82	Uganda	4.14	51.76
17	Slovakia	5.33	80.97	83	Armenia	4.14	51.72
18	Chile	5.25	78.89	84	Lao PDR	4.12	51.24
19	New Zealand	5.23	78.48	85	Serbia	4.11	50.95
20	Australia	5.20	77.79	86	Romania	4.10	50.58
21	Costa Rica	5.20	77.71	87	Zambia	4.07	50.02
22	Panama	5.19	77.33	88	Tunisia	4.02	48.78
23	Belgium	5.15	76.58	89	Georgia	4.02	48.64
24	Lithuania	5.09	75.02	90	Tanzania, United Rep.	4.02	48.61
25	Mexico	5.08	74.80	91	Viet Nam	4.00	48.29
26	Canada	5.08	74.71	92	Nigeria	3.97	47.57
27	Qatar	5.04	73.66	93	Moldova, Rep.	3.97	47.39
28	Albania	5.03	73.48	94	Iran, Islamic Rep.	3.96	47.28
29	Spain	5.02	73.33	95	Madagascar	3.95	46.90
30	Azerbaijan	4.99	72.44	96	Tajikistan	3.95	46.89
31	Hungary	4.97	72.09	97	Mozambique	3.90	45.77
32	Finland	4.97	72.05	98	Kazakhstan	3.90	45.77
33	France	4.95	71.67	99	Paraguay	3.89	45.61
34	Philippines	4.95	71.65	100	Bangladesh	3.85	44.51
35	Saudi Arabia	4.95	71.49	101	Russian Federation	3.84	44.38
36	Norway	4.93	70.98	102	Kuwait	3.82	43.76
37	Jamaica	4.92	70.73	103	Mongolia	3.80	43.29
38	Czech Republic	4.90	70.25	104	Botswana	3.79	42.99
39	Bahrain	4.87	69.65	105	Sri Lanka	3.77	42.54
40	Dominican Republic	4.84	68.81	106	Argentina	3.74	41.79
41	Thailand	4.80	67.84	107	Burkina Faso	3.71	41.08
42	Estonia	4.79	67.67	108	Bhutan	3.70	40.76
43	Uruguay	4.78	67.48	109	Greece	3.66	39.85
44	Indonesia	4.75	66.69	110	Mali	3.65	39.53
45	Poland	4.74	66.28	111	Croatia	3.63	39.20
46	Austria	4.74	66.28	112	Ethiopia	3.63	39.09
47	Morocco	4.73	66.15	113	Cameroon	3.59	38.05
48	Korea, Rep.	4.69	65.23	114	Algeria	3.58	37.96
49	Honduras	4.67	64.64	115	Bosnia and Herzegovina	3.58	37.96
50	Kenya	4.66	64.55	116	North Macedonia	3.56	37.49
51	China	4.66	64.42	117	El Salvador	3.54	36.83
52	India	4.64	63.84	118	Ecuador	3.52	36.46
53	Cambodia	4.59	62.79	119	Ukraine	3.51	36.29
54	Gambia	4.58	62.34	120	Congo, Dem. Rep.	3.46	34.92
55	Latvia	4.56	62.09	121	Liberia	3.44	34.36
56	Montenegro	4.53	61.32	122	Eswatini	3.39	33.23
57	Brazil	4.53	61.16	123	Nepal	3.35	32.35
58	South Africa	4.49	60.16	124	Malawi	3.35	32.22
59	Jordan	4.49	60.14	125	Angola	3.33	31.76
60	Oman	4.44	58.99	126	Burundi	3.30	30.91
61	Slovenia	4.43	58.80	127	Bolivia, Plurinational St.	3.27	30.39
62	Peru	4.42	58.52	128	Kyrgyzstan	2.89	20.95
63	Bulgaria	4.42	58.46	129	Zimbabwe	2.84	19.79
64	Cyprus	4.36	57.07	130	Lesotho	2.81	18.96
65	Egypt	4.36	57.05	131	Venezuela, Bolivarian Rep.	2.43	9.64
66	Iceland	4.34	56.48	132	Yemen	2.04	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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2.1.2 Prevalence of foreign ownership

Average answer to the question: In your country, how prevalent is foreign ownership of companies? [1 = extremely rare; 7 = extremely prevalent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Luxembourg	6.22	100.00	67	China	4.48	57.62
2	Slovakia	6.07	96.33	68	Congo, Dem. Rep.	4.48	57.55
3	Singapore	6.06	95.97	69	Cameroon	4.47	57.17
4	United Kingdom	6.03	95.35	70	Argentina	4.44	56.60
5	Czech Republic	5.98	94.05	71	Norway	4.43	56.34
6	Belgium	5.83	90.39	72	Bulgaria	4.40	55.49
7	Ireland	5.71	87.52	73	Madagascar	4.38	55.18
8	Estonia	5.67	86.50	74	Paraguay	4.38	55.11
9	Japan	5.65	85.97	75	Georgia	4.36	54.69
10	Switzerland	5.63	85.54	76	Jordan	4.36	54.54
11	Denmark	5.57	84.12	77	Lao PDR	4.35	54.24
12	United States of America	5.55	83.50	78	Cabo Verde	4.35	54.22
13	New Zealand	5.51	82.63	79	Nicaragua	4.34	53.97
14	Australia	5.50	82.47	80	Trinidad and Tobago	4.33	53.78
15	Gambia	5.46	81.36	81	Guatemala	4.32	53.67
16	Bahrain	5.46	81.33	82	Korea, Rep.	4.32	53.63
17	Chile	5.45	81.24	83	Croatia	4.31	53.42
18	Canada	5.45	81.11	84	Mozambique	4.31	53.35
19	France	5.42	80.55	85	Cambodia	4.28	52.74
20	Panama	5.40	80.04	86	El Salvador	4.26	52.26
21	Zambia	5.39	79.77	87	Philippines	4.24	51.72
22	Liberia	5.39	79.75	88	Italy	4.24	51.60
23	Mexico	5.38	79.50	89	Colombia	4.21	51.00
24	Sweden	5.38	79.42	90	Tunisia	4.21	51.00
25	Germany	5.32	77.98	91	Oman	4.21	50.86
26	United Arab Emirates	5.28	77.04	92	Rwanda	4.20	50.76
27	Netherlands	5.27	76.69	93	Albania	4.20	50.71
28	Morocco	5.24	75.95	94	Brunei Darussalam	4.12	48.68
29	Israel	5.21	75.26	95	Brazil	4.11	48.57
30	Côte d'Ivoire	5.20	74.98	96	Greece	4.11	48.54
31	Malaysia	5.20	74.96	97	Slovenia	4.08	47.66
32	Costa Rica	5.19	74.86	98	Pakistan	4.03	46.52
33	Finland	5.18	74.58	99	Burkina Faso	4.03	46.50
34	Spain	5.15	73.84	100	Saudi Arabia	3.99	45.56
35	Malta	5.12	73.03	101	Tanzania, United Rep.	3.99	45.49
36	Uganda	5.08	72.23	102	Kazakhstan	3.98	45.32
37	Ghana	5.08	72.14	103	Viet Nam	3.92	43.77
38	Botswana	5.08	72.12	104	Armenia	3.90	43.29
39	Cyprus	5.05	71.33	105	Mongolia	3.87	42.63
40	Eswatini	5.01	70.48	106	North Macedonia	3.85	42.09
41	Latvia	4.97	69.50	107	Zimbabwe	3.83	41.73
42	Dominican Republic	4.96	69.26	108	Egypt	3.83	41.73
43	Austria	4.95	68.97	109	Bangladesh	3.83	41.69
44	Uruguay	4.94	68.71	110	Mali	3.83	41.67
45	Portugal	4.94	68.69	111	Turkey	3.81	41.11
46	Namibia	4.90	67.74	112	Bosnia and Herzegovina	3.78	40.49
47	Senegal	4.85	66.63	113	Kyrgyzstan	3.78	40.38
48	South Africa	4.84	66.35	114	Tajikistan	3.68	38.01
49	Azerbaijan	4.83	66.12	115	Ethiopia	3.66	37.60
50	Peru	4.82	65.73	116	Sri Lanka	3.66	37.56
51	Poland	4.79	65.17	117	Angola	3.63	36.87
52	Malawi	4.78	64.88	118	Moldova, Rep.	3.61	36.18
53	Jamaica	4.77	64.55	119	Ukraine	3.51	33.75
54	Kenya	4.74	63.84	120	Iceland	3.48	33.10
55	Hungary	4.71	63.17	121	Russian Federation	3.41	31.40
56	Thailand	4.70	62.93	122	Ecuador	3.36	30.09
57	Mauritius	4.65	61.74	123	Burundi	3.31	28.88
58	India	4.63	61.24	124	Algeria	3.28	28.23
59	Romania	4.62	60.91	125	Bolivia, Plurinational St.	3.19	25.92
60	Nigeria	4.62	60.91	126	Kuwait	3.18	25.70
61	Qatar	4.60	60.51	127	Lesotho	3.15	25.15
62	Serbia	4.56	59.44	128	Venezuela, Bolivarian Rep.	3.07	23.01
63	Montenegro	4.54	58.90	129	Bhutan	3.03	22.20
64	Indonesia	4.53	58.61	130	Nepal	2.98	20.84
65	Honduras	4.49	57.65	131	Iran, Islamic Rep.	2.72	14.70
66	Lithuania	4.48	57.62	132	Yemen	2.12	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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2.1.3 Migrant stock

Adult migrant stock (%) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United Arab Emirates.....	4.51	100.00	67	Zimbabwe.....	1.75	38.85
2	Kuwait.....	4.42	98.07	68	Burundi.....	1.73	38.41
3	Qatar.....	4.24	93.95	69	Czech Republic.....	1.73	38.31
4	Oman.....	4.12	91.38	70	Cabo Verde.....	1.69	37.59
5	Bahrain.....	4.04	89.66	71	Eswatini.....	1.63	36.14
6	Luxembourg.....	3.99	88.46	72	Trinidad and Tobago.....	1.59	35.37
7	Singapore.....	3.94	87.30	73	Slovakia.....	1.56	34.68
8	Saudi Arabia.....	3.80	84.36	74	Moldova, Rep.	1.54	34.26
9	Australia.....	3.58	79.40	75	Azerbaijan.....	1.48	32.78
10	Israel.....	3.56	79.05	76	Mali.....	1.47	32.55
11	Switzerland.....	3.56	79.02	77	Cameroon.....	1.46	32.31
12	Jordan.....	3.50	77.69	78	Paraguay.....	1.46	32.29
13	Brunei Darussalam.....	3.42	75.90	79	Iran, Islamic Rep.....	1.44	32.05
14	New Zealand.....	3.33	73.79	80	Pakistan.....	1.44	31.92
15	Kazakhstan.....	3.31	73.47	81	Liberia.....	1.40	31.16
16	Canada.....	3.26	72.31	82	Angola.....	1.36	30.21
17	Austria.....	3.15	69.95	83	Nepal.....	1.35	30.05
18	Sweden.....	3.04	67.44	84	Chile.....	1.31	29.00
19	United States of America.....	3.03	67.11	85	Mauritius.....	1.29	28.72
20	Ireland.....	2.99	66.23	86	Kenya.....	1.29	28.56
21	Estonia.....	2.96	65.75	87	Senegal.....	1.27	28.26
22	Côte d'Ivoire.....	2.95	65.40	88	Uruguay.....	1.25	27.64
23	Cyprus.....	2.92	64.69	89	Korea, Rep.....	1.24	27.40
24	Gambia.....	2.91	64.49	90	Malawi.....	1.22	27.04
25	Norway.....	2.89	63.99	91	Ecuador.....	1.19	26.47
26	Germany.....	2.88	63.79	92	Yemen.....	1.12	24.78
27	Latvia.....	2.87	63.70	93	Georgia.....	1.08	23.93
28	Croatia.....	2.82	62.44	94	Ghana.....	1.05	23.31
29	United Kingdom.....	2.78	61.64	95	Poland.....	1.02	22.62
30	France.....	2.76	61.13	96	Zambia.....	1.02	22.56
31	Netherlands.....	2.71	60.11	97	Bulgaria.....	0.98	21.77
32	Spain.....	2.69	59.63	98	Congo, Dem. Rep.....	0.98	21.71
33	Slovenia.....	2.68	59.48	99	Japan.....	0.97	21.41
34	Montenegro.....	2.68	59.37	100	Tanzania, United Rep.....	0.94	20.93
35	Iceland.....	2.66	58.94	101	Bolivia, Plurinational St.....	0.90	20.02
36	Ukraine.....	2.64	58.65	102	Ethiopia.....	0.85	18.77
37	Denmark.....	2.61	57.92	103	Mozambique.....	0.84	18.72
38	Greece.....	2.59	57.45	104	Romania.....	0.79	17.48
39	Serbia.....	2.55	56.65	105	Bangladesh.....	0.74	16.50
40	Malta.....	2.54	56.24	106	Albania.....	0.70	15.50
41	Malaysia.....	2.52	55.93	107	Bosnia and Herzegovina.....	0.69	15.34
42	Belgium.....	2.50	55.55	108	Lao PDR.....	0.69	15.33
43	Costa Rica.....	2.49	55.15	109	El Salvador.....	0.61	13.47
44	Italy.....	2.45	54.34	110	Mongolia.....	0.58	12.88
45	South Africa.....	2.38	52.69	111	Jamaica.....	0.57	12.64
46	Botswana.....	2.37	52.51	112	Algeria.....	0.54	12.00
47	Russian Federation.....	2.36	52.24	113	Guatemala.....	0.53	11.81
48	Portugal.....	2.33	51.70	114	Cambodia.....	0.53	11.66
49	Bhutan.....	2.31	51.17	115	Nigeria.....	0.50	11.01
50	Armenia.....	2.23	49.43	116	Egypt.....	0.50	10.99
51	Uganda.....	2.13	47.34	117	Nicaragua.....	0.48	10.58
52	North Macedonia.....	2.09	46.38	118	Honduras.....	0.44	9.76
53	Burkina Faso.....	2.05	45.40	119	India.....	0.44	9.69
54	Argentina.....	2.04	45.34	120	Tunisia.....	0.42	9.41
55	Finland.....	2.04	45.24	121	Lesotho.....	0.37	8.17
56	Namibia.....	2.03	44.97	122	Mexico.....	0.36	8.03
57	Turkey.....	2.01	44.49	123	Brazil.....	0.32	7.04
58	Panama.....	1.99	44.21	124	Peru.....	0.24	5.28
59	Venezuela, Bolivarian Rep.....	1.97	43.62	125	Morocco.....	0.23	5.14
60	Tajikistan.....	1.92	42.68	126	Colombia.....	0.19	4.15
61	Thailand.....	1.88	41.65	127	Philippines.....	0.18	4.03
62	Hungary.....	1.87	41.48	128	Madagascar.....	0.17	3.71
63	Kyrgyzstan.....	1.86	41.29	129	Sri Lanka.....	0.08	1.87
64	Rwanda.....	1.85	41.01	130	Indonesia.....	0.07	1.52
65	Lithuania.....	1.80	40.03	131	Viet Nam.....	0.03	0.60
66	Dominican Republic.....	1.77	39.15	132	China.....	0.00	0.00

SOURCE: United Nations Population Division, Trends in International Migrant Stock: Migrants by Age and Sex (www.un.org/en/development/desa/population/migration/data/estimates2/estimates17.shtml)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

2.1.4 International students

Tertiary inbound mobility ratio (%) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Luxembourg	46.99	100.00	67	Kazakhstan	2.21	8.03
1	Qatar	35.28	100.00	68	Côte d'Ivoire	2.13	7.74
1	Singapore	27.22	100.00	69	Azerbaijan	2.07	7.52
1	United Arab Emirates	48.55	100.00	70	Morocco	1.99	7.22
5	New Zealand	19.84	72.85	71	Korea, Rep.	1.93	7.00
6	United Kingdom	18.10	66.43	72	Egypt	1.83	6.64
7	Switzerland	17.59	64.57	73	Rwanda	1.73	6.26
8	Cyprus	17.53	64.36	74	Dominican Republic	1.73	6.25
9	Australia	17.49	64.20	75	Madagascar	1.66	5.99
10	Austria	16.35	60.01	76	Albania	1.51	5.47
11	Jordan	13.94	51.15	77	Turkey	1.31	4.73
12	Bahrain	13.15	48.24	78	Thailand	1.31	4.71
13	Belgium	12.02	44.10	79	Costa Rica	1.30	4.68
14	Canada	11.89	43.62	80	Malawi	1.14	4.08
15	Czech Republic	11.51	42.22	81	Cameroon	1.13	4.06
16	Denmark	10.81	39.65	82	Mongolia	0.97	3.45
17	Netherlands	10.74	39.40	83	Kenya	0.89	3.16
18	Uganda	10.73	39.36	84	Mali	0.86	3.05
19	France	9.89	36.27	85	Tajikistan	0.84	3.00
20	Hungary	8.86	32.46	86	Cabo Verde	0.82	2.91
21	Malta	8.43	30.90	87	Ecuador	0.78	2.75
22	Senegal	8.32	30.50	88	Honduras	0.76	2.71
23	Ireland	8.19	30.00	89	Algeria	0.55	1.93
24	Malaysia	8.07	29.56	90	Eswatini	0.51	1.77
25	Germany	8.04	29.45	91	Zimbabwe	0.47	1.61
26	Finland	7.81	28.60	92	Sri Lanka	0.45	1.56
27	Latvia	7.67	28.10	93	Congo, Dem. Rep.	0.44	1.51
28	Bosnia and Herzegovina	7.12	26.06	94	Iran, Islamic Rep.	0.43	1.48
29	Namibia	7.06	25.87	95	Croatia	0.43	1.47
30	Estonia	6.80	24.91	96	Lao PDR	0.42	1.46
31	Iceland	6.78	24.82	97	El Salvador	0.39	1.34
32	Sweden	6.58	24.08	98	Chile	0.37	1.26
33	Kyrgyzstan	6.40	23.43	99	China	0.36	1.21
34	Slovakia	6.02	22.04	100	Lesotho	0.32	1.09
35	Georgia	5.55	20.31	101	Mexico	0.30	0.99
36	Italy	5.10	18.66	102	Mozambique	0.29	0.98
37	United States of America	5.04	18.42	103	Viet Nam	0.24	0.79
38	Portugal	5.00	18.30	104	Brazil	0.24	0.78
39	Saudi Arabia	4.92	18.00	105	Colombia	0.19	0.58
40	Romania	4.82	17.64	106	India	0.14	0.41
41	Bulgaria	4.57	16.72	107	Philippines	0.10	0.27
42	Mauritius	4.55	16.62	108	Bangladesh	0.10	0.27
43	Serbia	4.43	16.20	109	Venezuela, Bolivarian Rep.	0.09	0.23
44	Armenia	4.30	15.72	110	Indonesia	0.07	0.17
45	South Africa	4.28	15.65	111	Nepal	0.03	0.00
46	Yemen	4.26	15.56		Angola	n/a	n/a
47	Moldova, Rep.	4.13	15.09		Bhutan	n/a	n/a
48	Lithuania	4.11	15.01		Bolivia, Plurinational St.	n/a	n/a
49	Russian Federation	3.94	14.39		Cambodia	n/a	n/a
50	Norway	3.92	14.32		Ethiopia	n/a	n/a
51	Brunei Darussalam	3.76	13.73		Gambia	n/a	n/a
52	Japan	3.73	13.61		Guatemala	n/a	n/a
53	North Macedonia	3.49	12.74		Jamaica	n/a	n/a
54	Poland	3.42	12.47		Kuwait	n/a	n/a
55	Greece	3.35	12.20		Liberia	n/a	n/a
56	Slovenia	3.31	12.07		Montenegro	n/a	n/a
57	Ukraine	3.16	11.53		Nicaragua	n/a	n/a
58	Oman	2.95	10.73		Nigeria	n/a	n/a
59	Ghana	2.92	10.65		Pakistan	n/a	n/a
60	Burkina Faso	2.90	10.56		Panama	n/a	n/a
61	Burundi	2.90	10.56		Paraguay	n/a	n/a
62	Israel	2.78	10.11		Peru	n/a	n/a
63	Spain	2.71	9.87		Tanzania, United Rep.	n/a	n/a
64	Botswana	2.70	9.81		Trinidad and Tobago	n/a	n/a
65	Argentina	2.47	8.99		Uruguay	n/a	n/a
66	Tunisia	2.26	8.20		Zambia	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

2.1.5 Brain gain

Average answer to the question: Does your country attract talented people from abroad? [1 = not at all; 7 = to a great extent—attracts the best and brightest from around the world] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.12	100.00	67	Peru.....	3.35	43.29
2	United States of America.....	5.86	94.77	68	Czech Republic.....	3.35	43.27
3	Singapore.....	5.85	94.47	69	Nigeria.....	3.35	43.16
4	United Kingdom.....	5.78	93.19	70	Morocco.....	3.33	42.75
5	Luxembourg.....	5.70	91.53	71	South Africa.....	3.32	42.51
6	United Arab Emirates.....	5.69	91.35	72	Malawi.....	3.30	42.14
7	Canada.....	5.27	82.74	73	Dominican Republic.....	3.30	42.13
8	Qatar.....	5.18	80.87	74	Jordan.....	3.28	41.73
9	Netherlands.....	5.18	80.82	75	Lesotho.....	3.27	41.66
10	Malaysia.....	5.13	79.75	76	Cabo Verde.....	3.26	41.48
11	Germany.....	5.08	78.76	77	Mozambique.....	3.26	41.33
12	Malta.....	5.04	77.83	78	Mali.....	3.24	40.90
13	New Zealand.....	4.98	76.61	79	Uganda.....	3.22	40.63
14	Ireland.....	4.93	75.67	80	Viet Nam.....	3.20	40.20
15	Australia.....	4.88	74.64	81	Paraguay.....	3.20	40.18
16	Oman.....	4.85	73.99	82	Honduras.....	3.15	39.17
17	Rwanda.....	4.85	73.95	83	Spain.....	3.14	38.93
18	Azerbaijan.....	4.69	70.78	84	Madagascar.....	3.14	38.83
19	Saudi Arabia.....	4.60	68.96	85	Colombia.....	3.13	38.74
20	India.....	4.58	68.38	86	Eswatini.....	3.11	38.25
21	Bahrain.....	4.57	68.31	87	Guatemala.....	3.05	37.11
22	Sweden.....	4.56	67.97	88	Georgia.....	3.05	37.01
23	Norway.....	4.52	67.28	89	Ecuador.....	3.05	37.01
24	China.....	4.48	66.50	90	Argentina.....	3.02	36.37
25	Gambia.....	4.43	65.36	91	Armenia.....	3.01	36.19
26	Panama.....	4.39	64.66	92	Egypt.....	2.95	34.97
27	Indonesia.....	4.39	64.48	93	Montenegro.....	2.85	32.96
28	Denmark.....	4.22	61.06	94	Nicaragua.....	2.84	32.73
29	Chile.....	4.19	60.38	95	Hungary.....	2.79	31.75
30	Kenya.....	4.16	59.86	96	Burkina Faso.....	2.79	31.64
31	Belgium.....	4.14	59.34	97	Uruguay.....	2.72	30.22
32	Israel.....	4.10	58.67	98	Bangladesh.....	2.71	30.14
33	Iceland.....	4.07	57.97	99	Angola.....	2.70	29.87
34	Austria.....	4.05	57.55	100	Ukraine.....	2.70	29.84
35	Ghana.....	4.03	57.20	101	Slovenia.....	2.69	29.71
36	Costa Rica.....	4.01	56.76	102	Congo, Dem. Rep.....	2.69	29.60
37	Korea, Rep.....	3.96	55.83	103	Cameroon.....	2.68	29.40
38	Philippines.....	3.95	55.64	104	Italy.....	2.63	28.49
39	Mauritius.....	3.90	54.61	105	Brazil.....	2.57	27.12
40	Thailand.....	3.88	54.16	106	Lithuania.....	2.56	27.08
41	Botswana.....	3.86	53.67	107	Poland.....	2.54	26.52
42	Namibia.....	3.75	51.34	108	Mongolia.....	2.50	25.84
43	Liberia.....	3.74	51.27	109	Latvia.....	2.47	25.25
44	Brunei Darussalam.....	3.74	51.27	110	Bulgaria.....	2.44	24.54
45	Cambodia.....	3.72	50.81	111	Sri Lanka.....	2.41	23.91
46	France.....	3.67	49.86	112	Turkey.....	2.39	23.57
47	Portugal.....	3.66	49.66	113	Kyrgyzstan.....	2.39	23.51
48	Bhutan.....	3.65	49.45	114	Tunisia.....	2.30	21.76
49	Japan.....	3.65	49.35	115	Nepal.....	2.27	21.06
50	Finland.....	3.63	49.07	116	Burundi.....	2.26	20.92
51	Trinidad and Tobago.....	3.62	48.79	117	El Salvador.....	2.22	20.03
52	Jamaica.....	3.61	48.50	118	Iran, Islamic Rep.....	2.21	19.80
53	Pakistan.....	3.60	48.27	119	Serbia.....	2.20	19.70
54	Tajikistan.....	3.54	47.06	120	Bolivia, Plurinational St.....	2.17	19.07
55	Ethiopia.....	3.52	46.80	121	Zimbabwe.....	2.11	17.86
56	Kazakhstan.....	3.52	46.62	122	Slovakia.....	2.09	17.42
57	Mexico.....	3.51	46.56	123	Albania.....	2.09	17.32
58	Estonia.....	3.51	46.46	124	Algeria.....	2.07	16.88
59	Tanzania, United Rep.....	3.50	46.30	125	Moldova, Rep.....	1.91	13.67
60	Zambia.....	3.47	45.73	126	Greece.....	1.87	12.77
61	Senegal.....	3.47	45.59	127	Romania.....	1.80	11.31
62	Cyprus.....	3.46	45.57	128	North Macedonia.....	1.73	10.03
63	Lao PDR.....	3.46	45.45	129	Croatia.....	1.73	9.88
64	Côte d'Ivoire.....	3.45	45.18	130	Yemen.....	1.73	9.87
65	Kuwait.....	3.39	44.08	131	Bosnia and Herzegovina.....	1.45	4.21
66	Russian Federation.....	3.36	43.43	132	Venezuela, Bolivarian Rep.....	1.24	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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2.2.1 Tolerance of minorities

Discrimination and violence against minorities | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Iceland	1.00	100.00	65	Nicaragua	5.90	45.56
1	Ireland	1.00	100.00	68	Malaysia	6.00	44.44
3	Finland	1.20	97.78	69	El Salvador	6.10	43.33
4	Sweden	1.70	92.22	69	South Africa	6.10	43.33
5	Portugal	1.90	90.00	69	Spain	6.10	43.33
6	Singapore	2.00	88.89	69	Ukraine	6.10	43.33
7	Uruguay	2.20	86.67	69	United States of America	6.10	43.33
8	Oman	2.30	85.56	74	Poland	6.20	42.22
9	Korea, Rep.	2.70	81.11	74	Romania	6.20	42.22
9	Luxembourg	2.70	81.11	76	Cambodia	6.30	41.11
11	Canada	2.80	80.00	76	Slovakia	6.30	41.11
11	Eswatini	2.80	80.00	78	United Kingdom	6.40	40.00
11	Jamaica	2.80	80.00	79	Mexico	6.60	37.78
11	United Arab Emirates	2.80	80.00	79	North Macedonia	6.60	37.78
15	Chile	3.00	77.78	81	Ecuador	6.70	36.67
16	Japan	3.10	76.67	81	Lao PDR	6.70	36.67
17	Gambia	3.20	75.56	81	Zimbabwe	6.70	36.67
17	Mongolia	3.20	75.56	84	Tajikistan	6.80	35.56
17	New Zealand	3.20	75.56	85	Brazil	7.00	33.33
20	Australia	3.30	74.44	85	France	7.00	33.33
20	Lesotho	3.30	74.44	85	Moldova, Rep.	7.00	33.33
20	Malta	3.30	74.44	88	Colombia	7.10	32.22
20	Norway	3.30	74.44	88	Tunisia	7.10	32.22
20	Switzerland	3.30	74.44	90	Bosnia and Herzegovina	7.20	31.11
25	Cabo Verde	3.50	72.22	91	China	7.30	30.00
25	Madagascar	3.50	72.22	91	Georgia	7.30	30.00
27	Costa Rica	3.60	71.11	91	Indonesia	7.30	30.00
27	Trinidad and Tobago	3.60	71.11	94	Algeria	7.40	28.89
29	Ghana	3.80	68.89	95	Angola	7.50	27.78
29	Lithuania	3.80	68.89	95	Côte d'Ivoire	7.50	27.78
29	Mauritius	3.80	68.89	97	Estonia	7.60	26.67
32	Burkina Faso	3.90	67.78	97	Venezuela, Bolivarian Rep.	7.60	26.67
33	Qatar	4.00	66.67	99	Serbia	7.70	25.56
34	Kuwait	4.10	65.56	100	Burundi	7.90	23.33
35	Hungary	4.20	64.44	100	Philippines	7.90	23.33
35	Netherlands	4.20	64.44	100	Thailand	7.90	23.33
35	Slovenia	4.20	64.44	103	Bangladesh	8.00	22.22
38	Albania	4.30	63.33	103	India	8.00	22.22
38	Botswana	4.30	63.33	103	Peru	8.00	22.22
38	Denmark	4.30	63.33	106	Kazakhstan	8.10	21.11
41	Argentina	4.40	62.22	106	Kyrgyzstan	8.10	21.11
42	Austria	4.50	61.11	106	Mali	8.10	21.11
43	Germany	4.60	60.00	109	Uganda	8.30	18.89
44	Belgium	4.70	58.89	110	Saudi Arabia	8.40	17.78
45	Bulgaria	4.80	57.78	111	Bhutan	8.50	16.67
45	Czech Republic	4.80	57.78	111	Cameroon	8.50	16.67
45	Greece	4.80	57.78	111	Ethiopia	8.50	16.67
48	Italy	4.90	56.67	111	Latvia	8.50	16.67
49	Tanzania, United Rep.	5.00	55.56	111	Montenegro	8.50	16.67
50	Croatia	5.20	53.33	111	Morocco	8.50	16.67
50	Dominican Republic	5.20	53.33	117	Jordan	8.60	15.56
50	Liberia	5.20	53.33	117	Kenya	8.60	15.56
50	Namibia	5.20	53.33	117	Russian Federation	8.60	15.56
50	Paraguay	5.20	53.33	120	Egypt	8.90	12.22
55	Honduras	5.30	52.22	121	Bahrain	9.00	11.11
55	Malawi	5.30	52.22	121	Sri Lanka	9.00	11.11
55	Zambia	5.30	52.22	123	Guatemala	9.10	10.00
58	Bolivia, Plurinational St.	5.40	51.11	124	Nigeria	9.40	6.67
59	Armenia	5.50	50.00	124	Pakistan	9.40	6.67
60	Mozambique	5.60	48.89	126	Iran, Islamic Rep.	9.50	5.56
60	Panama	5.60	48.89	127	Yemen	9.60	4.44
62	Cyprus	5.70	47.78	128	Nepal	9.70	3.33
63	Senegal	5.80	46.67	129	Rwanda	9.80	2.22
63	Viet Nam	5.80	46.67	130	Congo, Dem. Rep.	10.00	0.00
65	Azerbaijan	5.90	45.56	130	Israel	10.00	0.00
65	Brunei Darussalam	5.90	45.56	130	Turkey	10.00	0.00

SOURCE: The Fund for Peace, *Fragile States Index 2019* (<https://fragilestatesindex.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

2.2.2 Tolerance of immigrants

The percentage of respondents answering 'Good place' to the question: Is the city or area where you live a good place or not a good place to live for immigrants from other countries? | 2018

Rank	Country	Value*	Score	Rank	Country	Value	Score
1	Canada.....	—	100.00	65	Serbia.....	—	58.90
2	New Zealand.....	—	98.63	65	Venezuela, Bolivarian Rep.....	—	58.90
3	Norway.....	—	97.26	69	Bolivia, Plurinational St.....	—	57.53
4	Australia.....	—	95.89	69	Colombia.....	—	57.53
4	Portugal.....	—	95.89	69	Georgia.....	—	57.53
4	United Arab Emirates.....	—	95.89	69	Liberia.....	—	57.53
7	Iceland.....	—	94.52	69	Trinidad and Tobago.....	—	57.53
8	Denmark.....	—	91.78	74	Dominican Republic.....	—	56.16
8	Ireland.....	—	91.78	74	Ethiopia.....	—	56.16
10	Luxembourg.....	—	90.41	74	Panama.....	—	56.16
11	Mauritius.....	—	89.04	74	Sri Lanka.....	—	56.16
12	Gambia.....	—	87.67	78	Ecuador.....	—	54.79
12	Spain.....	—	87.67	79	Angola.....	—	53.42
14	Qatar.....	—	86.30	79	Congo, Dem. Rep.....	—	53.42
14	Sweden.....	—	86.30	81	Turkey.....	—	52.05
16	Bahrain.....	—	84.93	82	Japan.....	—	50.68
16	Finland.....	—	84.93	83	Rwanda.....	—	49.32
16	Jamaica.....	—	84.93	83	Tanzania, United Rep.....	—	49.32
16	United Kingdom.....	—	84.93	85	Honduras.....	—	47.95
20	Netherlands.....	—	83.56	85	India.....	—	47.95
20	Saudi Arabia.....	—	83.56	85	Kazakhstan.....	—	47.95
20	United States of America.....	—	83.56	85	Korea, Rep.....	—	47.95
23	Mali.....	—	80.82	85	Mexico.....	—	47.95
23	Nepal.....	—	80.82	90	Madagascar.....	—	46.58
25	Argentina.....	—	79.45	91	Albania.....	—	45.21
25	Costa Rica.....	—	79.45	91	Guatemala.....	—	45.21
25	Germany.....	—	79.45	91	Iran, Islamic Rep.....	—	45.21
25	Singapore.....	—	79.45	91	Montenegro.....	—	45.21
25	Uruguay.....	—	79.45	91	Tunisia.....	—	45.21
30	Burkina Faso.....	—	75.34	96	Jordan.....	—	43.84
30	Kuwait.....	—	75.34	96	Pakistan.....	—	43.84
30	Paraguay.....	—	75.34	98	Greece.....	—	41.10
30	Senegal.....	—	75.34	98	Russian Federation.....	—	41.10
34	Ghana.....	—	73.97	100	Morocco.....	—	39.73
34	Nigeria.....	—	73.97	101	Viet Nam.....	—	38.36
36	Bangladesh.....	—	72.60	102	China.....	—	35.62
36	Chile.....	—	72.60	102	Lao PDR.....	—	35.62
38	Botswana.....	—	71.23	102	Uganda.....	—	35.62
38	Malta.....	—	71.23	105	Malawi.....	—	34.25
38	Mozambique.....	—	71.23	106	Slovenia.....	—	32.88
38	Nicaragua.....	—	71.23	107	Bosnia and Herzegovina.....	—	31.51
38	Switzerland.....	—	71.23	107	Egypt.....	—	31.51
43	Belgium.....	—	69.86	109	Ukraine.....	—	28.77
43	Brazil.....	—	69.86	110	Lithuania.....	—	27.40
45	Austria.....	—	68.49	111	Algeria.....	—	26.03
46	Cameroon.....	—	67.12	111	Moldova, Rep.....	—	26.03
46	Cyprus.....	—	67.12	113	North Macedonia.....	—	24.66
46	Eswatini.....	—	67.12	113	Slovakia.....	—	24.66
46	France.....	—	67.12	113	Yemen.....	—	24.66
46	Peru.....	—	67.12	116	Thailand.....	—	23.29
51	Namibia.....	—	65.75	117	Poland.....	—	21.92
51	South Africa.....	—	65.75	118	Indonesia.....	—	20.55
51	Zambia.....	—	65.75	118	Israel.....	—	20.55
51	Zimbabwe.....	—	65.75	120	Romania.....	—	17.81
55	El Salvador.....	—	64.38	121	Czech Republic.....	—	15.07
55	Italy.....	—	64.38	121	Estonia.....	—	15.07
55	Tajikistan.....	—	64.38	123	Croatia.....	—	13.70
58	Côte d'Ivoire.....	—	63.01	123	Mongolia.....	—	13.70
58	Kenya.....	—	63.01	125	Latvia.....	—	12.33
60	Armenia.....	—	60.27	126	Bulgaria.....	—	9.59
60	Burundi.....	—	60.27	126	Malaysia.....	—	9.59
60	Kyrgyzstan.....	—	60.27	128	Cambodia.....	—	4.11
60	Lesotho.....	—	60.27	129	Hungary.....	—	0.00
60	Philippines.....	—	60.27		Brunei Darussalam.....	n/a	n/a
65	Azerbaijan.....	—	58.90		Cabo Verde.....	n/a	n/a
65	Bhutan.....	—	58.90		Oman.....	n/a	n/a

SOURCE: The Gallup World Poll (2006–2018). Data kindly provided by Gallup, Inc.

For some countries, the latest year for which data is available may differ from the year that appears at the top of the page. The cut-off year is 2008.

*Confidential data.

2.2.3 Social mobility

Average answer to the question: In your country, to what extent do individuals have the opportunity to improve their economic situation through their personal efforts regardless of the socioeconomic status of their parents? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.24	100.00	67	Gambia.....	4.26	57.19
2	Finland.....	6.22	99.50	68	Lao PDR.....	4.24	56.70
3	Singapore.....	6.01	95.08	69	Honduras.....	4.22	56.23
4	Iceland.....	5.98	94.29	70	Thailand.....	4.21	56.03
5	Australia.....	5.96	93.97	71	Poland.....	4.20	55.88
6	Luxembourg.....	5.91	92.83	72	Spain.....	4.16	54.93
7	Canada.....	5.88	92.23	73	Nigeria.....	4.14	54.54
8	Denmark.....	5.84	91.36	74	Kuwait.....	4.11	53.92
9	United States of America.....	5.81	90.74	75	Sri Lanka.....	4.11	53.87
10	New Zealand.....	5.80	90.40	76	Montenegro.....	4.10	53.76
11	Netherlands.....	5.79	90.30	77	Côte d'Ivoire.....	4.10	53.74
12	Norway.....	5.71	88.53	78	Panama.....	4.03	52.26
13	Austria.....	5.61	86.35	79	Cabo Verde.....	4.01	51.85
14	Estonia.....	5.58	85.64	80	Pakistan.....	4.01	51.83
15	United Arab Emirates.....	5.45	82.82	81	Russian Federation.....	4.01	51.73
16	Belgium.....	5.44	82.65	82	Peru.....	4.00	51.59
17	Ireland.....	5.41	82.07	83	Zambia.....	4.00	51.55
18	Sweden.....	5.35	80.78	84	Ethiopia.....	3.95	50.54
19	Germany.....	5.29	79.49	85	Bangladesh.....	3.95	50.45
20	Bahrain.....	5.26	78.70	86	Eswatini.....	3.95	50.37
21	Malta.....	5.21	77.60	87	Paraguay.....	3.94	50.21
22	Czech Republic.....	5.20	77.50	88	Egypt.....	3.93	50.05
23	Malaysia.....	5.19	77.27	89	Armenia.....	3.93	49.94
24	Saudi Arabia.....	5.19	77.23	90	Kyrgyzstan.....	3.92	49.83
25	Qatar.....	5.15	76.50	91	Jordan.....	3.89	49.11
26	Israel.....	5.13	75.92	92	Turkey.....	3.87	48.81
27	Japan.....	5.11	75.56	93	Brazil.....	3.86	48.62
28	United Kingdom.....	5.00	73.14	94	Viet Nam.....	3.83	47.83
29	Oman.....	4.96	72.29	95	Cameroon.....	3.83	47.78
30	Bhutan.....	4.96	72.27	96	Mexico.....	3.82	47.70
31	France.....	4.84	69.61	97	Nepal.....	3.79	47.11
32	Costa Rica.....	4.82	69.31	98	Italy.....	3.78	46.78
33	Rwanda.....	4.82	69.29	99	Cambodia.....	3.77	46.58
34	Latvia.....	4.81	69.05	100	Mali.....	3.75	46.19
35	Slovenia.....	4.80	68.77	101	Dominican Republic.....	3.74	45.93
36	India.....	4.74	67.56	102	Madagascar.....	3.71	45.32
37	Lithuania.....	4.73	67.34	103	South Africa.....	3.70	45.12
38	Indonesia.....	4.72	67.13	104	Korea, Rep.....	3.69	44.88
39	Trinidad and Tobago.....	4.67	65.94	105	Greece.....	3.69	44.83
40	Chile.....	4.62	64.90	106	Malawi.....	3.66	44.25
41	Mauritius.....	4.61	64.79	107	Iran, Islamic Rep.....	3.66	44.25
42	Philippines.....	4.59	64.39	108	Hungary.....	3.63	43.44
43	Uruguay.....	4.59	64.20	109	Albania.....	3.62	43.41
44	Brunei Darussalam.....	4.57	63.85	110	Algeria.....	3.61	43.05
45	Portugal.....	4.57	63.80	111	Nicaragua.....	3.56	42.09
46	Jamaica.....	4.53	63.06	112	Bulgaria.....	3.55	41.81
47	Mongolia.....	4.50	62.36	113	Moldova, Rep.....	3.54	41.69
48	China.....	4.49	62.10	114	Croatia.....	3.53	41.36
49	Kenya.....	4.46	61.54	115	Ecuador.....	3.52	41.27
50	Cyprus.....	4.46	61.48	116	Lesotho.....	3.52	41.23
51	Namibia.....	4.43	60.86	117	Congo, Dem. Rep.....	3.52	41.07
52	Burkina Faso.....	4.42	60.68	118	Serbia.....	3.50	40.77
53	Kazakhstan.....	4.40	60.08	119	Colombia.....	3.46	39.86
54	Slovakia.....	4.38	59.79	120	Romania.....	3.45	39.65
55	Uganda.....	4.38	59.79	121	Ukraine.....	3.45	39.56
56	Botswana.....	4.38	59.77	122	Zimbabwe.....	3.39	38.30
57	Morocco.....	4.35	59.12	123	Burundi.....	3.37	37.83
58	Tanzania, United Rep.....	4.34	58.96	124	Argentina.....	3.32	36.92
59	Azerbaijan.....	4.33	58.64	125	Mozambique.....	3.27	35.71
60	Ghana.....	4.33	58.57	126	Bosnia and Herzegovina.....	3.11	32.22
61	Tajikistan.....	4.31	58.21	127	Yemen.....	3.04	30.87
62	Tunisia.....	4.30	58.12	128	North Macedonia.....	2.98	29.41
63	Senegal.....	4.28	57.51	129	El Salvador.....	2.79	25.35
64	Liberia.....	4.27	57.47	130	Angola.....	2.73	24.05
65	Georgia.....	4.27	57.44	131	Bolivia, Plurinational St.....	2.52	19.53
66	Guatemala.....	4.27	57.43	132	Venezuela, Bolivarian Rep.....	1.62	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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2.2.4 Female graduates

Female tertiary graduates (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Tunisia.....	67.70	100.00	67	France.....	56.11	70.58
2	Namibia.....	67.53	99.56	68	Thailand.....	56.03	70.38
3	Panama.....	66.40	96.70	69	Spain.....	55.90	70.04
4	Qatar.....	66.38	96.66	70	Colombia.....	55.89	70.01
5	Dominican Republic.....	65.80	95.18	71	El Salvador.....	55.65	69.40
6	Poland.....	65.68	94.88	72	Kazakhstan.....	55.33	68.58
7	Latvia.....	65.64	94.78	73	United Arab Emirates.....	55.15	68.14
8	Argentina.....	65.35	94.03	74	Austria.....	54.93	67.57
9	Cyprus.....	64.50	91.88	75	Viet Nam.....	53.84	64.81
10	Iceland.....	64.45	91.76	76	Egypt.....	53.63	64.29
11	Honduras.....	64.45	91.75	77	Mexico.....	53.56	64.09
12	Albania.....	64.16	91.00	78	Ukraine.....	53.31	63.48
13	Algeria.....	64.14	90.97	79	Saudi Arabia.....	53.11	62.96
14	Uruguay.....	64.12	90.92	80	China.....	52.38	61.09
15	Estonia.....	64.01	90.64	81	Singapore.....	52.18	60.59
16	Brunei Darussalam.....	63.61	89.62	82	Ireland.....	51.88	59.85
17	Bahrain.....	63.60	89.59	83	Luxembourg.....	51.78	59.59
18	Cabo Verde.....	62.84	87.67	84	India.....	51.70	59.38
19	Slovakia.....	62.57	86.97	85	Korea, Rep.....	51.07	57.78
20	Lithuania.....	62.44	86.64	86	Germany.....	50.71	56.87
21	Guatemala.....	62.38	86.50	87	Angola.....	50.41	56.10
22	Sweden.....	62.34	86.40	88	Japan.....	49.56	53.95
23	Costa Rica.....	62.12	85.83	89	Turkey.....	49.24	53.13
24	Czech Republic.....	61.46	84.16	90	Lao PDR.....	49.15	52.91
25	Hungary.....	61.34	83.85	91	Switzerland.....	48.89	52.25
26	Bulgaria.....	61.21	83.52	92	Nepal.....	48.31	50.76
27	Mongolia.....	61.07	83.16	93	Madagascar.....	48.18	50.44
28	South Africa.....	61.00	82.98	94	Rwanda.....	47.95	49.85
29	Lesotho.....	60.83	82.55	95	Morocco.....	47.61	48.99
30	Brazil.....	60.71	82.25	96	Botswana.....	47.51	48.74
31	Georgia.....	60.47	81.65	97	Gambia.....	47.42	48.51
32	Sri Lanka.....	60.32	81.26	98	Mozambique.....	46.86	47.08
33	Croatia.....	59.84	80.03	99	Jordan.....	46.80	46.93
34	Montenegro.....	59.79	79.91	100	Kenya.....	45.23	42.95
35	Kyrgyzstan.....	59.68	79.63	101	Cambodia.....	42.77	36.71
36	Belgium.....	59.64	79.53	102	Tajikistan.....	42.52	36.07
37	Oman.....	59.55	79.31	103	Zimbabwe.....	41.54	33.58
38	Slovenia.....	59.45	79.05	104	Iran, Islamic Rep.....	41.17	32.65
39	Finland.....	59.34	78.78	105	Ghana.....	40.99	32.18
40	Moldova, Rep.....	59.32	78.73	106	Eswatini.....	38.77	26.55
41	Greece.....	59.26	78.57	107	Liberia.....	38.15	24.99
42	Malta.....	59.21	78.43	108	Senegal.....	36.97	21.99
43	Bosnia and Herzegovina.....	58.98	77.85	109	Congo, Dem. Rep.....	35.14	17.33
44	Indonesia.....	58.87	77.58	110	Bhutan.....	34.19	14.93
45	Norway.....	58.87	77.58	111	Ethiopia.....	33.52	13.22
46	Portugal.....	58.67	77.07	112	Burkina Faso.....	33.48	13.12
47	Philippines.....	58.61	76.92	113	Burundi.....	28.38	0.17
48	Romania.....	58.55	76.77	114	Bangladesh.....	28.31	0.00
49	Italy.....	58.51	76.68		Bolivia, Plurinational St.....	n/a	n/a
50	United States of America.....	58.41	76.41		Cameroon.....	n/a	n/a
51	Serbia.....	58.41	76.41		Côte d'Ivoire.....	n/a	n/a
52	Kuwait.....	58.28	76.09		Israel.....	n/a	n/a
53	Malaysia.....	57.88	75.07		Malawi.....	n/a	n/a
54	Australia.....	57.86	75.02		Mali.....	n/a	n/a
55	Azerbaijan.....	57.85	74.98		Mauritius.....	n/a	n/a
56	Ecuador.....	57.66	74.52		Nicaragua.....	n/a	n/a
57	Armenia.....	57.64	74.45		Nigeria.....	n/a	n/a
58	Canada.....	57.56	74.24		Pakistan.....	n/a	n/a
59	North Macedonia.....	57.43	73.93		Paraguay.....	n/a	n/a
60	New Zealand.....	57.25	73.48		Russian Federation.....	n/a	n/a
61	United Kingdom.....	57.22	73.39		Tanzania, United Rep.....	n/a	n/a
62	Peru.....	57.03	72.90		Trinidad and Tobago.....	n/a	n/a
63	Chile.....	56.97	72.76		Uganda.....	n/a	n/a
64	Netherlands.....	56.61	71.83		Venezuela, Bolivarian Rep.....	n/a	n/a
65	Jamaica.....	56.38	71.25		Yemen.....	n/a	n/a
66	Denmark.....	56.36	71.21		Zambia.....	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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2.2.5 Gender development gap

Gender Development Index | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Qatar.....	1.03	100.00	67	Mauritius.....	0.97	77.45
2	Latvia.....	1.03	99.48	68	Italy.....	0.97	77.11
3	Lithuania.....	1.03	98.07	69	Germany.....	0.97	77.05
4	Mongolia.....	1.02	97.08	70	Netherlands.....	0.97	76.96
5	Russian Federation.....	1.02	95.83	71	Nicaragua.....	0.97	76.79
6	Estonia.....	1.02	95.64	72	New Zealand.....	0.97	76.68
7	Uruguay.....	1.01	93.77	73	Iceland.....	0.97	76.67
8	Namibia.....	1.01	93.71	74	Greece.....	0.96	75.99
9	Trinidad and Tobago.....	1.01	93.43	75	Madagascar.....	0.96	75.46
10	Venezuela, Bolivarian Rep.....	1.01	92.80	76	Chile.....	0.96	75.18
11	Kazakhstan.....	1.01	91.52	77	Malta.....	0.96	74.83
12	Poland.....	1.01	91.11	78	United Kingdom.....	0.96	74.76
13	Viet Nam.....	1.01	90.78	79	Kyrgyzstan.....	0.96	74.67
14	Moldova, Rep.....	1.00	90.64	80	Montenegro.....	0.96	73.25
15	Lesotho.....	1.00	90.33	81	China.....	0.96	72.88
16	Slovenia.....	1.00	89.81	82	Mexico.....	0.95	72.44
17	Burundi.....	1.00	89.54	83	Peru.....	0.95	71.04
18	Finland.....	1.00	89.01	84	Azerbaijan.....	0.95	70.87
19	Philippines.....	1.00	88.99	85	Cabo Verde.....	0.95	70.74
20	Colombia.....	1.00	87.81	86	Guatemala.....	0.95	70.27
21	Argentina.....	1.00	87.72	87	North Macedonia.....	0.95	69.64
22	Thailand.....	1.00	87.52	88	Eswatini.....	0.94	68.44
23	Ukraine.....	0.99	86.42	89	Oman.....	0.94	68.27
24	Brazil.....	0.99	86.13	90	Rwanda.....	0.94	67.91
25	United States of America.....	0.99	86.07	91	Zambia.....	0.94	67.72
26	Sweden.....	0.99	86.01	92	Malawi.....	0.94	66.04
27	Norway.....	0.99	85.84	93	Sri Lanka.....	0.94	65.85
28	Croatia.....	0.99	85.74	94	Lao PDR.....	0.93	65.23
29	Slovakia.....	0.99	85.54	95	Tajikistan.....	0.93	65.11
30	Brunei Darussalam.....	0.99	85.51	96	Indonesia.....	0.93	64.75
31	Bulgaria.....	0.99	85.37	97	Korea, Rep.....	0.93	64.69
32	Kuwait.....	0.99	85.35	98	Kenya.....	0.93	64.38
33	Dominican Republic.....	0.99	85.13	99	Bahrain.....	0.93	64.38
34	Panama.....	0.99	84.80	100	Bolivia, Plurinational St.....	0.93	63.47
35	Jamaica.....	0.99	84.65	101	Tanzania, United Rep.....	0.93	63.24
36	France.....	0.99	84.34	102	Nepal.....	0.92	62.02
37	Switzerland.....	0.99	84.16	103	Zimbabwe.....	0.92	61.98
38	Canada.....	0.99	83.76	104	Bosnia and Herzegovina.....	0.92	61.77
39	Czech Republic.....	0.99	83.74	105	Turkey.....	0.92	61.08
40	Hungary.....	0.99	83.61	106	Cambodia.....	0.91	58.42
41	Romania.....	0.98	83.39	107	Senegal.....	0.91	57.30
42	Cyprus.....	0.98	83.06	108	Ghana.....	0.91	56.71
43	South Africa.....	0.98	83.05	109	Mozambique.....	0.90	54.73
44	Portugal.....	0.98	82.95	110	Tunisia.....	0.90	52.39
45	Singapore.....	0.98	82.49	111	Bhutan.....	0.89	50.65
46	Denmark.....	0.98	81.67	112	Gambia.....	0.89	49.79
47	Ireland.....	0.98	81.59	113	Bangladesh.....	0.88	46.58
48	Spain.....	0.98	81.37	114	Saudi Arabia.....	0.88	45.13
49	Ecuador.....	0.98	81.14	115	Egypt.....	0.87	43.31
50	Honduras.....	0.98	80.92	116	Iran, Islamic Rep.....	0.87	42.99
51	Serbia.....	0.98	80.44	117	Burkina Faso.....	0.87	42.70
52	Botswana.....	0.98	80.23	118	Nigeria.....	0.87	41.82
53	Malaysia.....	0.98	80.18	119	Cameroon.....	0.87	41.12
54	Japan.....	0.98	80.04	120	Uganda.....	0.86	40.76
55	Georgia.....	0.98	80.00	121	Algeria.....	0.86	39.26
56	Australia.....	0.97	79.88	122	Jordan.....	0.86	38.01
57	Israel.....	0.97	79.83	123	Congo, Dem. Rep.....	0.85	36.11
58	Costa Rica.....	0.97	79.76	124	Ethiopia.....	0.85	34.21
59	Paraguay.....	0.97	78.80	125	Liberia.....	0.85	34.03
60	Belgium.....	0.97	78.52	126	India.....	0.84	32.29
61	Austria.....	0.97	78.51	127	Côte d'Ivoire.....	0.84	32.19
62	Albania.....	0.97	78.38	128	Morocco.....	0.84	31.25
63	Luxembourg.....	0.97	77.99	129	Mali.....	0.81	21.53
64	Armenia.....	0.97	77.99	130	Pakistan.....	0.75	0.00
65	El Salvador.....	0.97	77.73	130	Yemen.....	0.43	0.00
66	United Arab Emirates.....	0.97	77.56		Angola.....	n/a	n/a

SOURCE: United Nations Development Programme, *Human Development Indices and Indicators: 2018 Statistical Update* (<http://hdr.undp.org/en/content/gender-development-index-gdi>)

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2.2.6 Leadership opportunities for women

Average answer to the question: In your country, to what extent do companies provide women with the same opportunities as men to rise to positions of leadership? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Finland.....	6.07	100.00	67	Senegal.....	4.35	45.00
2	Iceland.....	5.91	94.70	68	Sri Lanka.....	4.34	44.67
3	Philippines.....	5.87	93.55	69	Cabo Verde.....	4.32	44.18
4	Sweden.....	5.71	88.55	70	Ghana.....	4.32	44.09
5	United States of America.....	5.71	88.53	71	Cyprus.....	4.32	44.01
6	Singapore.....	5.71	88.39	72	Japan.....	4.31	43.77
7	Norway.....	5.69	87.85	73	Panama.....	4.31	43.63
8	Bhutan.....	5.54	83.03	74	Tunisia.....	4.29	43.28
9	United Arab Emirates.....	5.51	81.98	75	Portugal.....	4.28	42.67
10	Malaysia.....	5.50	81.78	76	Bulgaria.....	4.27	42.36
11	Oman.....	5.49	81.30	77	Slovakia.....	4.25	41.88
12	Denmark.....	5.46	80.45	78	Serbia.....	4.24	41.46
13	Latvia.....	5.46	80.32	79	Zimbabwe.....	4.23	41.18
14	Albania.....	5.40	78.67	80	Saudi Arabia.....	4.22	40.98
15	Canada.....	5.37	77.74	81	Honduras.....	4.22	40.84
16	Luxembourg.....	5.37	77.64	82	Greece.....	4.21	40.46
17	Germany.....	5.30	75.48	83	Kenya.....	4.20	40.12
18	New Zealand.....	5.28	74.80	84	Tanzania, United Rep.....	4.18	39.77
19	Bahrain.....	5.28	74.60	85	Zambia.....	4.18	39.60
20	Rwanda.....	5.25	73.87	86	Côte d'Ivoire.....	4.15	38.67
21	Switzerland.....	5.24	73.38	87	Nigeria.....	4.13	38.11
22	Estonia.....	5.21	72.63	88	Uruguay.....	4.12	37.68
23	Gambia.....	5.21	72.61	89	Poland.....	4.11	37.33
24	Qatar.....	5.15	70.43	90	Viet Nam.....	4.09	36.78
25	Thailand.....	5.11	69.23	91	Madagascar.....	4.09	36.62
26	Australia.....	5.04	67.03	92	Bangladesh.....	4.07	36.04
27	Indonesia.....	5.04	66.94	93	Morocco.....	4.07	35.99
28	Lithuania.....	5.03	66.70	94	Guatemala.....	4.05	35.49
29	Romania.....	5.02	66.57	95	Burundi.....	4.01	34.31
30	Netherlands.....	5.01	66.14	96	Cameroon.....	4.01	34.19
31	Tajikistan.....	5.00	65.80	97	Mauritius.....	3.97	33.03
32	Brunei Darussalam.....	5.00	65.76	98	South Africa.....	3.97	33.00
33	Algeria.....	4.95	64.35	99	Eswatini.....	3.97	32.79
34	Czech Republic.....	4.92	63.12	100	Pakistan.....	3.93	31.56
35	Uganda.....	4.91	62.83	101	Bosnia and Herzegovina.....	3.92	31.38
36	Kazakhstan.....	4.89	62.43	102	Nicaragua.....	3.86	29.34
37	Ireland.....	4.88	61.92	103	Argentina.....	3.85	29.11
38	Azerbaijan.....	4.86	61.41	104	Ecuador.....	3.85	28.96
39	Russian Federation.....	4.85	61.00	105	Colombia.....	3.84	28.83
40	Slovenia.....	4.84	60.67	106	Nepal.....	3.83	28.51
41	United Kingdom.....	4.83	60.33	107	Dominican Republic.....	3.83	28.41
42	Lao PDR.....	4.83	60.26	108	France.....	3.81	27.93
43	Armenia.....	4.81	59.86	109	Korea, Rep.....	3.81	27.73
44	Ukraine.....	4.76	58.09	110	Mali.....	3.76	26.37
45	Mongolia.....	4.73	57.32	111	Chile.....	3.76	26.16
46	Malta.....	4.73	57.27	112	Malawi.....	3.74	25.74
47	Belgium.....	4.73	57.13	113	Mozambique.....	3.74	25.67
48	Namibia.....	4.69	55.86	114	Ethiopia.....	3.72	25.08
49	Israel.....	4.68	55.72	115	Hungary.....	3.68	23.68
50	Montenegro.....	4.67	55.27	116	Turkey.....	3.66	22.98
51	Kyrgyzstan.....	4.62	53.52	117	Peru.....	3.62	21.71
52	Egypt.....	4.61	53.29	118	Spain.....	3.60	21.13
53	Botswana.....	4.60	52.94	119	Congo, Dem. Rep.....	3.55	19.42
54	Jamaica.....	4.57	52.16	120	Croatia.....	3.53	19.00
55	China.....	4.56	51.79	121	North Macedonia.....	3.52	18.53
56	Trinidad and Tobago.....	4.54	51.18	122	Iran, Islamic Rep.....	3.51	18.26
57	Austria.....	4.54	51.12	123	Brazil.....	3.47	16.88
58	India.....	4.53	50.83	124	Angola.....	3.45	16.37
59	Moldova, Rep.....	4.52	50.53	125	Mexico.....	3.43	15.85
60	Jordan.....	4.46	48.71	126	Paraguay.....	3.42	15.48
61	Georgia.....	4.43	47.58	127	Burkina Faso.....	3.39	14.38
62	Cambodia.....	4.43	47.49	128	Italy.....	3.35	13.15
63	Venezuela, Bolivarian Rep.....	4.40	46.60	129	Lesotho.....	3.34	12.83
64	Kuwait.....	4.37	45.72	130	El Salvador.....	3.28	10.75
65	Liberia.....	4.37	45.70	131	Bolivia, Plurinational St.....	3.21	8.72
66	Costa Rica.....	4.36	45.36	132	Yemen.....	2.94	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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Pillar 3

Grow

3.1.1 Vocational enrolment

Vocational enrolment (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Bolivia, Plurinational St.....	64.65	100.00	67	Burundi.....	10.09	15.56
2	Finland.....	47.88	74.05	68	Brunei Darussalam.....	10.06	15.51
3	United Kingdom.....	45.68	70.64	69	Lithuania.....	9.74	15.02
4	Belgium.....	45.58	70.49	70	Gambia.....	9.62	14.82
5	Slovenia.....	45.05	69.66	71	Korea, Rep.....	9.57	14.74
6	Croatia.....	39.83	61.59	72	Mozambique.....	9.24	14.23
7	Honduras.....	38.53	59.58	73	Tunisia.....	9.07	13.98
8	Bosnia and Herzegovina.....	38.02	58.78	74	Malta.....	8.98	13.83
9	Switzerland.....	37.46	57.92	75	Albania.....	8.96	13.80
10	Czech Republic.....	37.43	57.87	76	Algeria.....	8.33	12.83
11	Australia.....	36.62	56.63	77	Cyprus.....	8.20	12.62
12	Netherlands.....	36.28	56.09	78	Kyrgyzstan.....	8.03	12.37
13	Serbia.....	34.81	53.83	79	Morocco.....	8.01	12.34
14	Austria.....	34.65	53.57	80	Ukraine.....	7.67	11.80
15	Italy.....	34.29	53.01	81	Colombia.....	7.50	11.55
16	Luxembourg.....	33.16	51.26	82	South Africa.....	7.47	11.50
17	Montenegro.....	32.52	50.27	83	Liberia.....	7.39	11.38
18	Slovakia.....	31.55	48.77	84	Ethiopia.....	7.00	10.78
19	North Macedonia.....	29.60	45.75	85	Bahrain.....	6.58	10.12
20	Bulgaria.....	29.44	45.51	86	Côte d'Ivoire.....	5.64	8.67
21	Poland.....	28.34	43.80	87	Venezuela, Bolivarian Rep.....	5.39	8.29
22	Guatemala.....	28.21	43.61	88	Saudi Arabia.....	5.39	8.29
23	Norway.....	28.16	43.52	89	Dominican Republic.....	5.27	8.10
24	Romania.....	27.54	42.57	90	Canada.....	4.73	7.27
25	Mexico.....	26.75	41.35	91	Georgia.....	4.29	6.58
26	Portugal.....	25.81	39.89	92	Brazil.....	4.16	6.37
27	Turkey.....	25.05	38.71	93	Bangladesh.....	4.00	6.13
28	Costa Rica.....	24.33	37.59	94	Eswatini.....	3.91	5.98
29	Denmark.....	22.58	34.89	95	Sri Lanka.....	3.76	5.76
30	Uruguay.....	22.26	34.39	96	Jordan.....	3.48	5.33
31	Egypt.....	21.79	33.66	97	Senegal.....	3.13	4.78
32	Sweden.....	21.64	33.43	98	Pakistan.....	2.84	4.33
33	Cameroon.....	21.62	33.41	99	Ghana.....	2.69	4.10
34	Estonia.....	21.41	33.08	100	Cabo Verde.....	2.62	3.99
35	Iceland.....	20.94	32.36	101	Burkina Faso.....	2.58	3.93
36	Latvia.....	20.37	31.46	102	Kuwait.....	2.41	3.67
37	Israel.....	19.72	30.46	103	Cambodia.....	2.28	3.46
38	Indonesia.....	19.26	29.74	104	Madagascar.....	2.17	3.30
39	Chile.....	19.25	29.74	105	Lesotho.....	2.09	3.18
40	China.....	19.17	29.62	106	Bhutan.....	2.04	3.09
41	Germany.....	19.11	29.52	107	Peru.....	1.98	3.00
42	Congo, Dem. Rep.....	18.86	29.12	108	United Arab Emirates.....	1.89	2.87
43	Spain.....	18.45	28.49	109	Nicaragua.....	1.48	2.23
44	France.....	17.95	27.72	110	Tajikistan.....	1.41	2.13
45	El Salvador.....	17.63	27.23	111	India.....	1.33	2.00
46	Ireland.....	16.18	24.98	112	Lao PDR.....	1.02	1.52
47	Paraguay.....	15.86	24.49	113	Qatar.....	0.66	0.95
48	Russian Federation.....	15.84	24.46	114	Nepal.....	0.65	0.95
49	Greece.....	15.69	24.22	115	Kenya.....	0.49	0.69
50	Panama.....	15.59	24.07	116	Tanzania, United Rep.....	0.42	0.59
51	Ecuador.....	15.14	23.37	117	Yemen.....	0.25	0.32
52	Moldova, Rep.....	14.46	22.32	118	Oman.....	0.04	0.00
53	New Zealand.....	14.44	22.30		Argentina.....	n/a	n/a
54	Angola.....	14.14	21.82		Azerbaijan.....	n/a	n/a
55	Malaysia.....	13.44	20.75		Botswana.....	n/a	n/a
56	Iran, Islamic Rep.....	13.43	20.73		Jamaica.....	n/a	n/a
57	Rwanda.....	13.03	20.10		Malawi.....	n/a	n/a
58	Mali.....	13.00	20.07		Namibia.....	n/a	n/a
59	Mauritius.....	11.73	18.09		Nigeria.....	n/a	n/a
60	Hungary.....	11.61	17.91		Philippines.....	n/a	n/a
61	Singapore.....	11.57	17.84		Trinidad and Tobago.....	n/a	n/a
62	Japan.....	11.47	17.69		Uganda.....	n/a	n/a
63	Kazakhstan.....	10.80	16.66		United States of America.....	n/a	n/a
64	Armenia.....	10.52	16.22		Viet Nam.....	n/a	n/a
65	Thailand.....	10.27	15.84		Zambia.....	n/a	n/a
66	Mongolia.....	10.10	15.58		Zimbabwe.....	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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3.1.2 Tertiary enrolment

Tertiary enrolment (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Greece.....	126.38	100.00	67	Malaysia.....	41.93	32.76
2	Australia.....	113.77	89.96	68	North Macedonia.....	41.14	32.14
3	Turkey.....	103.75	81.98	69	Moldova, Rep.....	41.08	32.09
4	Korea, Rep.....	93.78	74.04	70	Mauritius.....	38.84	30.31
5	Chile.....	91.47	72.21	71	Mexico.....	38.18	29.78
6	Spain.....	91.18	71.97	72	Indonesia.....	36.28	28.26
7	Argentina.....	89.08	70.30	73	Philippines.....	35.28	27.47
8	United States of America.....	88.84	70.11	74	Paraguay.....	35.08	27.31
9	Latvia.....	88.06	69.49	75	Egypt.....	34.44	26.80
10	Finland.....	86.99	68.64	76	Morocco.....	33.76	26.26
11	Austria.....	86.31	68.10	77	Brunei Darussalam.....	32.92	25.59
12	Singapore.....	83.94	66.21	78	Kuwait.....	32.57	25.32
13	Ukraine.....	83.42	65.80	79	Tunisia.....	32.06	24.91
14	New Zealand.....	82.00	64.67	80	Jordan.....	31.71	24.62
15	Norway.....	81.97	64.64	81	Tajikistan.....	30.87	23.96
16	Russian Federation.....	81.82	64.52	82	El Salvador.....	28.69	22.23
17	Denmark.....	81.06	63.91	83	Viet Nam.....	28.26	21.88
18	Netherlands.....	80.36	63.36	84	India.....	27.54	21.31
19	Slovenia.....	77.62	61.18	85	Azerbaijan.....	27.07	20.93
20	Ireland.....	77.56	61.13	86	Jamaica.....	26.88	20.78
21	Venezuela, Bolivarian Rep.....	76.99	60.68	87	Botswana.....	23.01	17.70
22	Belgium.....	75.89	59.80	88	Guatemala.....	21.78	16.73
23	Iceland.....	73.60	57.98	89	Cabo Verde.....	21.71	16.66
24	Estonia.....	71.39	56.22	90	Honduras.....	20.78	15.93
25	Bulgaria.....	71.23	56.09	91	Namibia.....	20.64	15.81
26	Lithuania.....	71.12	56.00	92	South Africa.....	20.48	15.68
27	Peru.....	69.62	54.81	93	Luxembourg.....	19.56	14.96
28	Saudi Arabia.....	68.94	54.27	94	Cameroon.....	19.17	14.65
29	Iran, Islamic Rep.....	68.85	54.19	95	Sri Lanka.....	18.97	14.48
30	Germany.....	68.33	53.78	96	Bangladesh.....	17.62	13.41
31	Croatia.....	67.48	53.11	97	Qatar.....	16.42	12.45
32	Canada.....	67.04	52.76	98	Ghana.....	16.16	12.25
33	Poland.....	66.56	52.37	99	Lao PDR.....	15.72	11.90
34	Serbia.....	66.49	52.32	100	Cambodia.....	13.14	9.84
35	Mongolia.....	64.84	51.00	101	Nepal.....	11.79	8.77
36	France.....	64.44	50.69	102	Liberia.....	11.67	8.67
37	Czech Republic.....	63.75	50.13	103	Kenya.....	11.66	8.67
38	Sweden.....	63.55	49.98	104	Senegal.....	11.22	8.32
39	Italy.....	63.02	49.55	105	Bhutan.....	10.51	7.75
40	Portugal.....	62.94	49.49	106	Nigeria.....	10.17	7.48
41	Israel.....	62.65	49.26	107	Pakistan.....	10.12	7.44
42	Uruguay.....	62.35	49.02	108	Yemen.....	9.97	7.32
43	Colombia.....	60.43	47.49	109	Angola.....	9.43	6.89
44	Cyprus.....	60.10	47.23	110	Côte d'Ivoire.....	9.16	6.68
45	Dominican Republic.....	59.92	47.08	111	Lesotho.....	9.10	6.63
46	United Kingdom.....	59.41	46.68	112	Zimbabwe.....	8.48	6.14
47	Montenegro.....	58.24	45.75	113	Ethiopia.....	8.12	5.85
48	Switzerland.....	57.87	45.45	114	Rwanda.....	7.64	5.46
49	Georgia.....	57.53	45.18	115	Mozambique.....	6.94	4.91
50	Albania.....	56.98	44.74	116	Congo, Dem. Rep.....	6.61	4.64
51	Costa Rica.....	55.61	43.66	117	Burundi.....	6.16	4.29
52	Kazakhstan.....	53.25	41.78	118	Burkina Faso.....	6.00	4.16
53	Armenia.....	52.24	40.97	119	Mali.....	5.49	3.75
54	China.....	51.01	39.99	120	Eswatini.....	5.38	3.67
55	Brazil.....	50.49	39.58	121	Madagascar.....	4.83	3.22
56	Thailand.....	49.29	38.62	122	Uganda.....	4.62	3.06
57	Malta.....	48.84	38.26	123	Zambia.....	4.01	2.58
58	Hungary.....	48.03	37.62	124	Tanzania, United Rep.....	3.92	2.50
59	Romania.....	48.02	37.62	125	Gambia.....	3.09	1.85
60	Slovakia.....	47.80	37.43	126	Malawi.....	0.77	0.00
61	Algeria.....	47.72	37.38		Bolivia, Plurinational St.....	n/a	n/a
62	Panama.....	47.27	37.02		Bosnia and Herzegovina.....	n/a	n/a
63	Ecuador.....	45.55	35.65		Japan.....	n/a	n/a
64	Bahrain.....	45.50	35.61		Nicaragua.....	n/a	n/a
65	Oman.....	44.60	34.89		Trinidad and Tobago.....	n/a	n/a
66	Kyrgyzstan.....	43.65	34.14		United Arab Emirates.....	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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3.1.3 Tertiary education expenditure

Government expenditure on tertiary education (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Botswana.....	4.00	100.00	67	Ireland.....	0.88	19.49
2	Denmark.....	2.34	57.25	68	South Africa.....	0.88	19.48
3	Ethiopia.....	2.27	55.30	69	Honduras.....	0.88	19.44
4	Ecuador.....	2.18	52.92	70	Liberia.....	0.87	19.24
5	Norway.....	1.96	47.28	71	Viet Nam.....	0.85	18.67
6	Oman.....	1.92	46.24	72	Brunei Darussalam.....	0.84	18.36
7	Bolivia, Plurinational St.....	1.91	46.09	73	Colombia.....	0.81	17.75
8	Finland.....	1.89	45.65	74	Russian Federation.....	0.81	17.62
9	Sweden.....	1.88	45.34	75	Rwanda.....	0.78	16.97
10	Senegal.....	1.86	44.79	76	Czech Republic.....	0.77	16.69
11	Austria.....	1.78	42.71	77	Italy.....	0.76	16.36
12	Costa Rica.....	1.76	42.13	78	Albania.....	0.76	16.27
13	Burkina Faso.....	1.70	40.60	79	Tanzania, United Rep.....	0.74	16.00
14	Canada.....	1.63	38.84	80	Greece.....	0.73	15.55
15	Netherlands.....	1.63	38.76	81	Panama.....	0.70	14.76
16	New Zealand.....	1.59	37.88	82	Kenya.....	0.69	14.56
17	Tunisia.....	1.58	37.55	83	Mali.....	0.67	14.12
18	Namibia.....	1.57	37.31	84	Jordan.....	0.67	13.99
19	Venezuela, Bolivarian Rep.....	1.55	36.88	85	Romania.....	0.66	13.74
20	Australia.....	1.54	36.41	86	Hungary.....	0.66	13.72
21	Ukraine.....	1.53	36.20	87	Peru.....	0.65	13.66
22	Turkey.....	1.48	35.08	88	Japan.....	0.65	13.64
23	Iceland.....	1.46	34.37	89	Bulgaria.....	0.65	13.46
24	Belgium.....	1.45	34.20	90	Thailand.....	0.64	13.33
25	Estonia.....	1.41	33.19	91	Bhutan.....	0.61	12.51
26	Slovakia.....	1.39	32.67	92	Bahrain.....	0.60	12.38
27	United States of America.....	1.37	32.23	93	Indonesia.....	0.57	11.39
28	Chile.....	1.36	31.85	94	Tajikistan.....	0.52	10.21
29	United Kingdom.....	1.34	31.37	95	Congo, Dem. Rep.....	0.52	10.11
30	Brazil.....	1.34	31.34	96	Luxembourg.....	0.51	10.01
31	Malta.....	1.33	31.22	97	Bangladesh.....	0.51	9.96
32	Switzerland.....	1.33	31.17	98	Azerbaijan.....	0.50	9.58
33	Cyprus.....	1.32	30.86	99	Gambia.....	0.48	9.15
34	Burundi.....	1.31	30.65	100	Lesotho.....	0.47	8.94
35	Zimbabwe.....	1.27	29.50	101	Lao PDR.....	0.41	7.25
36	Germany.....	1.25	29.02	102	Nepal.....	0.40	7.10
37	France.....	1.25	28.92	103	Georgia.....	0.39	6.74
38	Iran, Islamic Rep.....	1.24	28.70	104	Guatemala.....	0.37	6.31
39	Poland.....	1.22	28.20	105	Uganda.....	0.37	6.24
40	Latvia.....	1.18	27.21	106	Sri Lanka.....	0.36	6.17
41	Lithuania.....	1.18	27.11	107	Armenia.....	0.36	6.16
42	Algeria.....	1.17	26.97	108	El Salvador.....	0.35	5.85
43	Uruguay.....	1.17	26.94	109	Philippines.....	0.32	4.96
44	Nicaragua.....	1.17	26.93	110	Kazakhstan.....	0.30	4.62
45	Argentina.....	1.13	26.07	111	Mauritius.....	0.29	4.37
46	Mexico.....	1.13	25.82	112	Cameroon.....	0.28	4.07
47	Ghana.....	1.13	25.82	113	Pakistan.....	0.28	4.03
48	Serbia.....	1.12	25.59	114	Mongolia.....	0.26	3.50
49	Malawi.....	1.10	25.10	115	Kyrgyzstan.....	0.20	1.91
50	India.....	1.10	25.09	116	Madagascar.....	0.19	1.56
51	Morocco.....	1.06	24.18	117	Cambodia.....	0.13	0.00
52	Paraguay.....	1.05	23.99		Angola.....	n/a	n/a
53	Côte d'Ivoire.....	1.04	23.51		Bosnia and Herzegovina.....	n/a	n/a
54	Jamaica.....	1.01	22.96		China.....	n/a	n/a
55	Singapore.....	1.00	22.63		Dominican Republic.....	n/a	n/a
56	Croatia.....	1.00	22.51		Egypt.....	n/a	n/a
57	Malaysia.....	1.00	22.48		Kuwait.....	n/a	n/a
58	Korea, Rep.....	1.00	22.47		Montenegro.....	n/a	n/a
59	Moldova, Rep.....	0.99	22.20		Nigeria.....	n/a	n/a
60	Slovenia.....	0.98	21.97		North Macedonia.....	n/a	n/a
61	Spain.....	0.96	21.46		Qatar.....	n/a	n/a
62	Israel.....	0.95	21.42		Saudi Arabia.....	n/a	n/a
63	Eswatini.....	0.95	21.30		Trinidad and Tobago.....	n/a	n/a
64	Cabo Verde.....	0.90	19.91		United Arab Emirates.....	n/a	n/a
65	Portugal.....	0.89	19.85		Yemen.....	n/a	n/a
66	Mozambique.....	0.89	19.67		Zambia.....	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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3.1.4 Reading, maths, and science

PISA average scores in reading, mathematics, and science | 2015

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Singapore.....	551.62	100.00	67	Dominican Republic.....	339.03	0.00
2	Japan.....	528.93	89.33		Angola.....	n/a	n/a
3	Estonia.....	524.29	87.14		Armenia.....	n/a	n/a
4	Canada.....	523.34	86.70		Azerbaijan.....	n/a	n/a
5	Finland.....	522.72	86.41		Bahrain.....	n/a	n/a
6	Korea, Rep.....	519.12	84.71		Bangladesh.....	n/a	n/a
7	China.....	514.34	82.46		Bhutan.....	n/a	n/a
8	Slovenia.....	509.33	80.11		Bolivia, Plurinational St.....	n/a	n/a
9	Ireland.....	509.04	79.97		Bosnia and Herzegovina.....	n/a	n/a
10	Germany.....	508.07	79.52		Botswana.....	n/a	n/a
11	Netherlands.....	507.93	79.45		Brunei Darussalam.....	n/a	n/a
12	Switzerland.....	506.32	78.69		Burkina Faso.....	n/a	n/a
13	New Zealand.....	505.93	78.51		Burundi.....	n/a	n/a
14	Norway.....	504.47	77.82		Cabo Verde.....	n/a	n/a
15	Denmark.....	504.28	77.73		Cambodia.....	n/a	n/a
16	Poland.....	503.87	77.54		Cameroon.....	n/a	n/a
17	Belgium.....	502.50	76.90		Congo, Dem. Rep.....	n/a	n/a
18	Australia.....	502.26	76.78		Côte d'Ivoire.....	n/a	n/a
19	Viet Nam.....	501.98	76.65		Ecuador.....	n/a	n/a
20	United Kingdom.....	499.89	75.67		Egypt.....	n/a	n/a
21	Portugal.....	496.95	74.28		El Salvador.....	n/a	n/a
22	Sweden.....	495.83	73.76		Eswatini.....	n/a	n/a
23	France.....	495.73	73.71		Ethiopia.....	n/a	n/a
24	Austria.....	492.22	72.06		Gambia.....	n/a	n/a
25	Russian Federation.....	491.77	71.85		Ghana.....	n/a	n/a
26	Spain.....	491.40	71.67		Guatemala.....	n/a	n/a
27	Czech Republic.....	490.80	71.39		Honduras.....	n/a	n/a
28	United States of America.....	487.60	69.89		India.....	n/a	n/a
29	Latvia.....	486.76	69.49		Iran, Islamic Rep.....	n/a	n/a
30	Italy.....	485.01	68.67		Jamaica.....	n/a	n/a
31	Luxembourg.....	483.34	67.88		Kenya.....	n/a	n/a
32	Iceland.....	480.93	66.75		Kuwait.....	n/a	n/a
33	Croatia.....	475.43	64.16		Kyrgyzstan.....	n/a	n/a
34	Lithuania.....	475.40	64.15		Lao PDR.....	n/a	n/a
35	Hungary.....	474.37	63.66		Lesotho.....	n/a	n/a
36	Israel.....	471.73	62.42		Liberia.....	n/a	n/a
37	Malta.....	463.36	58.49		Madagascar.....	n/a	n/a
38	Slovakia.....	462.84	58.24		Malawi.....	n/a	n/a
39	Greece.....	458.50	56.20		Mali.....	n/a	n/a
40	Kazakhstan.....	447.81	51.17		Mauritius.....	n/a	n/a
41	Chile.....	442.73	48.78		Mongolia.....	n/a	n/a
42	Malaysia.....	439.88	47.44		Morocco.....	n/a	n/a
43	Bulgaria.....	439.56	47.29		Mozambique.....	n/a	n/a
44	Cyprus.....	437.51	46.33		Namibia.....	n/a	n/a
45	Romania.....	437.49	46.31		Nepal.....	n/a	n/a
46	United Arab Emirates.....	432.59	44.01		Nicaragua.....	n/a	n/a
47	Uruguay.....	429.98	42.78		Nigeria.....	n/a	n/a
48	Turkey.....	424.76	40.33		Oman.....	n/a	n/a
49	Trinidad and Tobago.....	423.04	39.52		Pakistan.....	n/a	n/a
50	Argentina.....	422.19	39.12		Panama.....	n/a	n/a
51	Moldova, Rep.....	421.30	38.70		Paraguay.....	n/a	n/a
52	Montenegro.....	418.71	37.48		Philippines.....	n/a	n/a
53	Costa Rica.....	415.78	36.10		Rwanda.....	n/a	n/a
54	Mexico.....	415.67	36.05		Saudi Arabia.....	n/a	n/a
55	Thailand.....	415.31	35.88		Senegal.....	n/a	n/a
56	Albania.....	415.21	35.84		Serbia.....	n/a	n/a
57	Colombia.....	410.09	33.43		South Africa.....	n/a	n/a
58	Qatar.....	407.30	32.11		Sri Lanka.....	n/a	n/a
59	Georgia.....	405.42	31.23		Tajikistan.....	n/a	n/a
60	Jordan.....	399.01	28.22		Tanzania, United Rep.....	n/a	n/a
61	Indonesia.....	395.49	26.56		Uganda.....	n/a	n/a
62	Brazil.....	395.03	26.34		Ukraine.....	n/a	n/a
63	Peru.....	393.60	25.67		Venezuela, Bolivarian Rep.....	n/a	n/a
64	Tunisia.....	371.43	15.24		Yemen.....	n/a	n/a
65	North Macedonia.....	368.91	14.06		Zambia.....	n/a	n/a
66	Algeria.....	361.74	10.68		Zimbabwe.....	n/a	n/a

SOURCE: OECD Programme for International Student Assessment (PISA) (www.oecd.org/pisa)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.1.5 University ranking

QS World University Ranking | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	98.60	100.00	66	Bahrain.....	11.55	11.71
2	United Kingdom.....	95.67	97.03	66	Bangladesh.....	11.55	11.71
3	China.....	83.83	85.02	66	Kuwait.....	11.55	11.71
4	Switzerland.....	83.03	84.21	66	Panama.....	11.55	11.71
5	Australia.....	79.80	80.93	66	Paraguay.....	11.55	11.71
6	Canada.....	78.87	79.99	66	Romania.....	11.55	11.71
7	Japan.....	78.57	79.68	66	Serbia.....	11.55	11.71
8	Korea, Rep.....	73.63	74.68	66	Sri Lanka.....	11.55	11.71
9	Germany.....	70.10	71.10	75	Albania.....	0.00	0.00
10	France.....	69.60	70.59	75	Algeria.....	0.00	0.00
11	Singapore.....	69.50	70.49	75	Angola.....	0.00	0.00
12	Netherlands.....	67.37	68.32	75	Armenia.....	0.00	0.00
13	Sweden.....	59.27	60.11	75	Bhutan.....	0.00	0.00
14	Denmark.....	57.40	58.22	75	Bolivia, Plurinational St.....	0.00	0.00
15	Belgium.....	54.93	55.71	75	Bosnia and Herzegovina.....	0.00	0.00
16	Malaysia.....	54.60	55.38	75	Botswana.....	0.00	0.00
17	New Zealand.....	50.70	51.42	75	Burkina Faso.....	0.00	0.00
18	Finland.....	48.57	49.26	75	Burundi.....	0.00	0.00
19	Italy.....	47.87	48.55	75	Cabo Verde.....	0.00	0.00
20	Russian Federation.....	47.53	48.21	75	Cambodia.....	0.00	0.00
21	India.....	47.17	47.84	75	Cameroon.....	0.00	0.00
22	Ireland.....	47.00	47.67	75	Congo, Dem. Rep.....	0.00	0.00
23	Spain.....	45.90	46.55	75	Côte d'Ivoire.....	0.00	0.00
24	Norway.....	44.43	45.06	75	Cyprus.....	0.00	0.00
25	Austria.....	43.43	44.05	75	Dominican Republic.....	0.00	0.00
26	Mexico.....	42.85	43.46	75	El Salvador.....	0.00	0.00
27	Brazil.....	42.73	43.34	75	Eswatini.....	0.00	0.00
28	Israel.....	42.23	42.83	75	Ethiopia.....	0.00	0.00
29	Argentina.....	42.17	42.77	75	Gambia.....	0.00	0.00
30	Saudi Arabia.....	41.47	42.06	75	Georgia.....	0.00	0.00
31	Chile.....	40.93	41.51	75	Ghana.....	0.00	0.00
32	Qatar.....	35.80	36.31	75	Guatemala.....	0.00	0.00
33	Colombia.....	34.07	34.55	75	Honduras.....	0.00	0.00
34	Indonesia.....	33.40	33.87	75	Iceland.....	0.00	0.00
35	South Africa.....	33.13	33.60	75	Jamaica.....	0.00	0.00
36	United Arab Emirates.....	32.83	33.30	75	Kenya.....	0.00	0.00
37	Brunei Darussalam.....	31.75	32.20	75	Kyrgyzstan.....	0.00	0.00
38	Kazakhstan.....	31.63	32.08	75	Lao PDR.....	0.00	0.00
39	Portugal.....	30.30	30.73	75	Lesotho.....	0.00	0.00
40	Czech Republic.....	29.93	30.36	75	Liberia.....	0.00	0.00
41	Oman.....	28.90	29.31	75	Luxembourg.....	0.00	0.00
42	Poland.....	28.53	28.94	75	Madagascar.....	0.00	0.00
43	Thailand.....	27.60	27.99	75	Malawi.....	0.00	0.00
44	Pakistan.....	26.85	27.23	75	Mali.....	0.00	0.00
45	Turkey.....	24.03	24.37	75	Malta.....	0.00	0.00
46	Iran, Islamic Rep.....	22.77	23.10	75	Mauritius.....	0.00	0.00
47	Estonia.....	21.77	22.08	75	Moldova, Rep.....	0.00	0.00
48	Greece.....	21.47	21.77	75	Mongolia.....	0.00	0.00
49	Ukraine.....	21.23	21.53	75	Montenegro.....	0.00	0.00
50	Lithuania.....	20.18	20.47	75	Morocco.....	0.00	0.00
51	Hungary.....	19.56	19.84	75	Mozambique.....	0.00	0.00
52	Philippines.....	18.29	18.55	75	Namibia.....	0.00	0.00
53	Uruguay.....	17.93	18.18	75	Nepal.....	0.00	0.00
54	Slovenia.....	17.52	17.77	75	Nicaragua.....	0.00	0.00
55	Egypt.....	17.13	17.37	75	Nigeria.....	0.00	0.00
56	Peru.....	16.03	16.26	75	North Macedonia.....	0.00	0.00
57	Costa Rica.....	15.42	15.64	75	Rwanda.....	0.00	0.00
58	Jordan.....	15.00	15.21	75	Senegal.....	0.00	0.00
59	Bulgaria.....	14.65	14.86	75	Tajikistan.....	0.00	0.00
59	Croatia.....	14.65	14.86	75	Tanzania, United Rep.....	0.00	0.00
61	Viet Nam.....	13.72	13.92	75	Trinidad and Tobago.....	0.00	0.00
62	Slovakia.....	13.62	13.81	75	Tunisia.....	0.00	0.00
63	Latvia.....	13.00	13.18	75	Uganda.....	0.00	0.00
64	Venezuela, Bolivarian Rep.....	12.64	12.82	75	Yemen.....	0.00	0.00
65	Ecuador.....	12.32	12.50	75	Zambia.....	0.00	0.00
66	Azerbaijan.....	11.55	11.71	75	Zimbabwe.....	0.00	0.00

SOURCE: Quacquarelli Symonds Ltd (QS), QS World University Ranking 2020, Top Universities (<https://www.topuniversities.com/qs-world-university-rankings>)
For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.2.1 Quality of management schools

Average answer to the question: In your country, how do you assess the quality of business schools [1 = extremely poor—among the worst in the world; 7 = excellent—among the best in the world] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.39	100.00	67	Greece.....	4.16	46.92
2	Singapore.....	5.99	90.48	68	Venezuela, Bolivarian Rep.....	4.15	46.64
3	Netherlands.....	5.96	89.66	69	Rwanda.....	4.13	46.17
4	United Kingdom.....	5.95	89.46	70	Serbia.....	4.12	45.79
5	United States of America.....	5.90	88.31	71	Thailand.....	4.11	45.75
6	Canada.....	5.78	85.39	72	Madagascar.....	4.11	45.58
7	Belgium.....	5.71	83.77	73	Cabo Verde.....	4.10	45.45
8	Finland.....	5.62	81.53	74	South Africa.....	4.10	45.34
9	France.....	5.58	80.73	75	Albania.....	4.08	45.05
10	Spain.....	5.54	79.79	76	Poland.....	4.08	45.02
11	Denmark.....	5.50	78.87	77	Hungary.....	4.08	44.96
12	Ireland.....	5.50	78.75	78	Morocco.....	4.06	44.46
13	Sweden.....	5.46	77.73	79	Ecuador.....	4.05	44.14
14	Israel.....	5.43	77.19	80	Nepal.....	4.03	43.68
15	Italy.....	5.39	76.14	81	Nicaragua.....	4.00	43.11
16	Philippines.....	5.36	75.55	82	Burundi.....	4.00	43.10
17	Malaysia.....	5.36	75.44	83	Côte d'Ivoire.....	3.98	42.64
18	Australia.....	5.36	75.39	84	Russian Federation.....	3.94	41.59
19	Qatar.....	5.35	75.31	85	Lithuania.....	3.91	40.83
20	Iceland.....	5.25	72.89	86	Lao PDR.....	3.90	40.68
21	New Zealand.....	5.25	72.82	87	Burkina Faso.....	3.89	40.32
22	Norway.....	5.23	72.36	88	Zambia.....	3.88	40.07
23	Germany.....	5.22	72.09	89	Zimbabwe.....	3.87	40.04
24	United Arab Emirates.....	5.21	71.87	90	Dominican Republic.....	3.84	39.15
25	Costa Rica.....	5.20	71.62	91	Kazakhstan.....	3.81	38.55
26	Chile.....	5.12	69.70	92	Peru.....	3.79	38.04
27	Austria.....	5.09	68.94	93	Pakistan.....	3.77	37.65
28	Portugal.....	5.09	68.92	94	Slovakia.....	3.77	37.55
29	Lesotho.....	4.99	66.71	95	Ethiopia.....	3.77	37.50
30	Jamaica.....	4.99	66.57	96	Georgia.....	3.73	36.58
31	Estonia.....	4.96	66.02	97	Armenia.....	3.72	36.47
32	Trinidad and Tobago.....	4.92	64.90	98	Bangladesh.....	3.72	36.29
33	Bahrain.....	4.89	64.17	99	Croatia.....	3.72	36.27
34	Luxembourg.....	4.88	63.92	100	Honduras.....	3.71	36.06
35	Oman.....	4.83	62.81	101	Iran, Islamic Rep.....	3.70	35.93
36	Sri Lanka.....	4.79	61.84	102	Mali.....	3.70	35.83
37	Senegal.....	4.77	61.30	103	Uganda.....	3.69	35.76
38	Kenya.....	4.71	59.98	104	Panama.....	3.67	35.12
39	Argentina.....	4.71	59.87	105	Brazil.....	3.66	35.04
40	Saudi Arabia.....	4.69	59.52	106	Nigeria.....	3.63	34.26
41	Indonesia.....	4.69	59.42	107	Bulgaria.....	3.61	33.81
42	India.....	4.68	59.32	108	Kuwait.....	3.57	32.88
43	Malta.....	4.66	58.75	109	Botswana.....	3.55	32.26
44	Cyprus.....	4.66	58.65	110	El Salvador.....	3.52	31.72
45	Latvia.....	4.56	56.34	111	Tanzania, United Rep.....	3.49	31.00
46	Slovenia.....	4.49	54.68	112	Romania.....	3.47	30.35
47	China.....	4.48	54.44	113	Namibia.....	3.46	30.08
48	Montenegro.....	4.47	54.24	114	Viet Nam.....	3.45	30.02
49	Korea, Rep.....	4.45	53.64	115	Bolivia, Plurinational St.....	3.42	29.30
50	Japan.....	4.43	53.30	116	Algeria.....	3.42	29.29
51	Uruguay.....	4.42	53.03	117	Moldova, Rep.....	3.41	28.96
52	Ghana.....	4.40	52.52	118	Cambodia.....	3.37	28.06
53	Guatemala.....	4.39	52.42	119	Turkey.....	3.26	25.41
54	Cameroon.....	4.39	52.29	120	Liberia.....	3.26	25.39
55	Bhutan.....	4.37	51.85	121	Bosnia and Herzegovina.....	3.26	25.33
56	Mauritius.....	4.37	51.74	122	Congo, Dem. Rep.....	3.20	24.06
57	Gambia.....	4.29	49.84	123	Egypt.....	3.20	23.88
58	Czech Republic.....	4.28	49.69	124	Malawi.....	3.18	23.58
59	Mexico.....	4.27	49.46	125	Eswatini.....	3.06	20.73
60	Jordan.....	4.27	49.43	126	Paraguay.....	3.05	20.38
61	Brunei Darussalam.....	4.26	49.16	127	North Macedonia.....	3.00	19.27
62	Ukraine.....	4.25	48.94	128	Kyrgyzstan.....	2.98	18.75
63	Tajikistan.....	4.20	47.81	129	Mongolia.....	2.97	18.59
64	Colombia.....	4.20	47.72	130	Yemen.....	2.72	12.47
65	Azerbaijan.....	4.17	47.07	131	Mozambique.....	2.68	11.57
66	Tunisia.....	4.17	47.01	132	Angola.....	2.19	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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3.2.2 Prevalence of training in firms

Proportion of firms offering formal training (%) | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	China.....	79.20	100.00	67	Lao PDR.....	24.40	27.70
2	Ecuador.....	73.70	92.74	68	Montenegro.....	23.70	26.78
3	Sweden.....	70.30	88.26	69	Angola.....	23.50	26.52
4	Peru.....	65.90	82.45	70	Dominican Republic.....	23.40	26.39
5	Colombia.....	63.00	78.63	71	Liberia.....	22.80	25.59
6	Kyrgyzstan.....	62.70	78.23	72	Ukraine.....	22.60	25.33
7	Mongolia.....	59.80	74.41	73	Cambodia.....	22.20	24.80
7	Philippines.....	59.80	74.41	73	Viet Nam.....	22.20	24.80
9	Chile.....	57.50	71.37	75	Bangladesh.....	21.90	24.41
10	Nicaragua.....	57.30	71.11	76	Greece.....	21.60	24.01
11	Venezuela, Bolivarian Rep.....	56.00	69.39	77	Ethiopia.....	20.80	22.96
12	Guatemala.....	55.70	69.00	78	Mozambique.....	20.70	22.82
13	Rwanda.....	55.40	68.60	79	Azerbaijan.....	20.20	22.16
14	Czech Republic.....	55.10	68.21	80	Israel.....	18.60	20.05
15	Costa Rica.....	54.70	67.68	81	Malaysia.....	18.50	19.92
16	El Salvador.....	53.80	66.49	82	Sri Lanka.....	18.40	19.79
17	Uruguay.....	53.30	65.83	83	Thailand.....	18.00	19.26
18	Bosnia and Herzegovina.....	52.40	64.64	84	Mali.....	17.70	18.87
19	Botswana.....	51.90	63.98	85	Senegal.....	17.40	18.47
20	Mexico.....	50.80	62.53	86	Congo, Dem. Rep.....	17.00	17.94
21	Bolivia, Plurinational St.....	49.90	61.35	87	Cabo Verde.....	16.60	17.41
22	Croatia.....	49.30	60.55	88	Armenia.....	16.20	16.89
23	Honduras.....	47.70	58.44	89	Hungary.....	15.80	16.36
24	Paraguay.....	46.40	56.73	90	Yemen.....	14.30	14.38
25	Russian Federation.....	46.20	56.46	91	Madagascar.....	12.70	12.27
26	Slovakia.....	43.50	52.90	92	Panama.....	11.00	10.03
27	Bulgaria.....	42.70	51.85	93	Georgia.....	10.50	9.37
28	Brazil.....	42.20	51.19	94	Egypt.....	10.00	8.71
29	Lithuania.....	42.00	50.92	95	Indonesia.....	7.70	5.67
30	Slovenia.....	41.50	50.26	96	Jordan.....	3.40	0.00
31	Romania.....	40.70	49.21		Algeria.....	n/a	n/a
32	Argentina.....	40.20	48.55		Australia.....	n/a	n/a
33	Ghana.....	40.10	48.42		Austria.....	n/a	n/a
34	Serbia.....	37.80	45.38		Bahrain.....	n/a	n/a
35	Cameroon.....	37.60	45.12		Belgium.....	n/a	n/a
36	Kenya.....	37.40	44.85		Brunei Darussalam.....	n/a	n/a
37	Eswatini.....	36.10	43.14		Canada.....	n/a	n/a
38	India.....	35.90	42.88		Cyprus.....	n/a	n/a
39	Côte d'Ivoire.....	35.50	42.35		Denmark.....	n/a	n/a
40	Estonia.....	35.20	41.95		Finland.....	n/a	n/a
41	Uganda.....	34.70	41.29		France.....	n/a	n/a
42	Poland.....	34.60	41.16		Germany.....	n/a	n/a
43	Tajikistan.....	33.10	39.18		Iceland.....	n/a	n/a
44	Malawi.....	32.90	38.92		Iran, Islamic Rep.....	n/a	n/a
45	Moldova, Rep.....	32.40	38.26		Ireland.....	n/a	n/a
46	Burundi.....	32.00	37.73		Italy.....	n/a	n/a
46	Pakistan.....	32.00	37.73		Japan.....	n/a	n/a
48	Nepal.....	31.90	37.60		Korea, Rep.....	n/a	n/a
49	Lesotho.....	31.20	36.68		Kuwait.....	n/a	n/a
50	Nigeria.....	30.70	36.02		Luxembourg.....	n/a	n/a
50	Tanzania, United Rep.....	30.70	36.02		Malta.....	n/a	n/a
52	Tunisia.....	28.90	33.64		Netherlands.....	n/a	n/a
53	Turkey.....	28.40	32.98		New Zealand.....	n/a	n/a
54	Kazakhstan.....	28.30	32.85		North Macedonia.....	n/a	n/a
55	Zambia.....	28.20	32.72		Norway.....	n/a	n/a
56	Trinidad and Tobago.....	28.00	32.45		Oman.....	n/a	n/a
57	Albania.....	27.10	31.27		Portugal.....	n/a	n/a
58	Zimbabwe.....	26.40	30.34		Qatar.....	n/a	n/a
59	Morocco.....	26.30	30.21		Saudi Arabia.....	n/a	n/a
60	Bhutan.....	26.00	29.82		Singapore.....	n/a	n/a
61	Jamaica.....	25.90	29.68		South Africa.....	n/a	n/a
62	Mauritius.....	25.60	29.29		Spain.....	n/a	n/a
63	Namibia.....	25.40	29.02		Switzerland.....	n/a	n/a
64	Gambia.....	25.20	28.76		United Arab Emirates.....	n/a	n/a
64	Latvia.....	25.20	28.76		United Kingdom.....	n/a	n/a
66	Burkina Faso.....	24.80	28.23		United States of America.....	n/a	n/a

SOURCE: World Bank, Enterprise Surveys (www.enterprisesurveys.org)

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3.2.3 Employee development

Average answer to the question: In your country, to what extent do companies invest in training and employee development? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	5.86	100.00	67	Spain.....	3.83	37.04
2	United States of America.....	5.76	97.05	68	Montenegro.....	3.81	36.57
3	Luxembourg.....	5.54	90.11	69	Cambodia.....	3.81	36.44
4	Malaysia.....	5.36	84.46	70	Dominican Republic.....	3.81	36.42
5	Netherlands.....	5.36	84.45	71	Gambia.....	3.80	36.11
6	Singapore.....	5.35	84.23	72	Ukraine.....	3.80	36.06
7	Sweden.....	5.32	83.35	73	Brazil.....	3.79	35.81
8	Denmark.....	5.28	82.06	74	Kazakhstan.....	3.79	35.73
9	Finland.....	5.23	80.65	75	Rwanda.....	3.78	35.64
10	Germany.....	5.19	79.37	76	Mexico.....	3.78	35.57
11	Japan.....	5.15	78.21	77	Tunisia.....	3.77	35.40
12	Norway.....	5.09	76.33	78	Viet Nam.....	3.75	34.54
13	Australia.....	5.03	74.48	79	Lao PDR.....	3.74	34.42
14	Ireland.....	5.02	74.04	80	Panama.....	3.73	33.97
15	Austria.....	5.02	74.00	81	Liberia.....	3.72	33.67
16	Belgium.....	4.99	73.24	82	Uganda.....	3.69	32.91
17	Iceland.....	4.95	71.79	83	Zimbabwe.....	3.69	32.80
18	Canada.....	4.90	70.38	84	Argentina.....	3.69	32.76
19	United Arab Emirates.....	4.89	70.09	85	Mali.....	3.69	32.75
20	New Zealand.....	4.87	69.43	86	Colombia.....	3.66	31.98
21	Israel.....	4.81	67.48	87	Nigeria.....	3.65	31.63
22	United Kingdom.....	4.81	67.38	88	Serbia.....	3.65	31.60
23	France.....	4.80	67.34	89	Uruguay.....	3.64	31.30
24	Philippines.....	4.80	67.20	90	Morocco.....	3.64	31.10
25	Qatar.....	4.75	65.61	91	Mongolia.....	3.63	30.82
26	Bahrain.....	4.71	64.45	92	Tanzania, United Rep.....	3.62	30.65
27	Indonesia.....	4.71	64.35	93	Armenia.....	3.62	30.59
28	Lithuania.....	4.61	61.41	94	Malawi.....	3.62	30.57
29	Estonia.....	4.58	60.46	95	Greece.....	3.61	30.27
30	India.....	4.56	59.90	96	Hungary.....	3.58	29.28
31	Czech Republic.....	4.53	58.74	97	Ethiopia.....	3.57	29.00
32	China.....	4.50	57.78	98	Cameroon.....	3.56	28.79
33	Korea, Rep.....	4.49	57.47	99	Senegal.....	3.56	28.61
34	Oman.....	4.45	56.31	100	Italy.....	3.55	28.53
35	Costa Rica.....	4.42	55.38	101	Egypt.....	3.54	28.26
36	Trinidad and Tobago.....	4.40	54.77	102	Zambia.....	3.53	27.68
37	Mauritius.....	4.40	54.68	103	Madagascar.....	3.51	27.09
38	Jamaica.....	4.31	52.11	104	Turkey.....	3.50	26.87
39	Namibia.....	4.31	52.10	105	Lesotho.....	3.49	26.70
40	Slovenia.....	4.30	51.79	106	Paraguay.....	3.47	26.07
41	Malta.....	4.29	51.36	107	Cabo Verde.....	3.47	25.99
42	Kenya.....	4.28	51.06	108	Ecuador.....	3.47	25.92
43	Saudi Arabia.....	4.26	50.40	109	Georgia.....	3.47	25.90
44	Thailand.....	4.26	50.35	110	Tajikistan.....	3.47	25.90
45	Guatemala.....	4.25	50.05	111	El Salvador.....	3.44	25.01
46	Cyprus.....	4.22	49.32	112	Nicaragua.....	3.43	24.56
47	Chile.....	4.22	49.15	113	Venezuela, Bolivarian Rep.....	3.42	24.51
48	Ghana.....	4.21	49.01	114	Moldova, Rep.....	3.41	24.07
49	Latvia.....	4.21	48.79	115	Bulgaria.....	3.41	24.01
50	Slovakia.....	4.19	48.40	116	Algeria.....	3.41	23.94
51	South Africa.....	4.17	47.68	117	Romania.....	3.40	23.73
52	Azerbaijan.....	4.15	47.06	118	Iran, Islamic Rep.....	3.39	23.33
53	Honduras.....	4.13	46.34	119	Nepal.....	3.36	22.45
54	Côte d'Ivoire.....	4.12	46.01	120	Peru.....	3.30	20.77
55	Bhutan.....	4.12	45.98	121	Burundi.....	3.29	20.49
56	Portugal.....	4.10	45.37	122	Bangladesh.....	3.29	20.44
57	Jordan.....	4.10	45.34	123	Kyrgyzstan.....	3.27	19.79
58	Brunei Darussalam.....	4.00	42.30	124	Burkina Faso.....	3.14	15.79
59	Albania.....	3.97	41.39	125	Bolivia, Plurinational St.....	3.12	14.93
60	Eswatini.....	3.96	41.16	126	Croatia.....	3.08	13.81
61	Pakistan.....	3.96	41.09	127	Bosnia and Herzegovina.....	3.03	12.19
62	Poland.....	3.94	40.54	128	North Macedonia.....	2.98	10.88
63	Russian Federation.....	3.92	40.02	129	Congo, Dem. Rep.....	2.96	10.17
64	Botswana.....	3.91	39.54	130	Mozambique.....	2.90	8.20
65	Sri Lanka.....	3.85	37.77	131	Angola.....	2.65	0.37
66	Kuwait.....	3.85	37.69	132	Yemen.....	2.63	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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3.3.1 Delegation of authority

Average answer to the question: In your country, to what extent does senior management delegate authority to subordinates? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Denmark	6.09	100.00	67	Turkey	4.26	45.23
2	Sweden	6.03	97.96	68	Portugal	4.25	45.11
3	Switzerland	5.90	94.29	69	Russian Federation	4.24	44.64
4	Norway	5.79	91.05	70	Panama	4.22	44.26
5	Netherlands	5.78	90.73	71	Kazakhstan	4.21	43.79
6	Finland	5.77	90.39	72	Argentina	4.20	43.42
7	United States of America	5.70	88.39	73	Venezuela, Bolivarian Rep.	4.19	43.14
8	Australia	5.69	87.90	74	Tanzania, United Rep.	4.17	42.75
9	New Zealand	5.65	86.87	75	Jordan	4.17	42.56
10	Canada	5.61	85.67	76	Lao PDR	4.16	42.45
11	Ireland	5.59	85.02	77	Morocco	4.14	41.81
12	Germany	5.58	84.54	78	Dominican Republic	4.13	41.37
13	Belgium	5.54	83.52	79	Cyprus	4.12	41.02
14	United Kingdom	5.52	82.76	80	Tajikistan	4.11	41.00
15	Malaysia	5.50	82.28	81	Malawi	4.11	40.86
16	Luxembourg	5.48	81.78	82	Liberia	4.11	40.75
17	Iceland	5.48	81.55	83	Armenia	4.08	39.89
18	Singapore	5.40	79.35	84	Hungary	4.07	39.68
19	Austria	5.32	76.80	85	Korea, Rep.	4.06	39.48
20	Israel	5.30	76.30	86	Poland	4.06	39.41
21	Gambia	5.25	74.93	87	Uruguay	4.04	38.70
22	Qatar	5.18	72.84	88	Albania	4.03	38.47
23	United Arab Emirates	5.14	71.65	89	Kuwait	4.03	38.40
24	Japan	5.00	67.53	90	Peru	3.99	37.39
25	Indonesia	4.98	66.93	91	Serbia	3.99	37.32
26	Czech Republic	4.97	66.57	92	Georgia	3.97	36.54
27	Estonia	4.97	66.55	93	Ukraine	3.94	35.84
28	Jamaica	4.95	65.78	94	Pakistan	3.94	35.82
29	Philippines	4.89	64.09	95	Bulgaria	3.93	35.39
30	Oman	4.89	64.03	96	Greece	3.92	35.09
31	Lithuania	4.83	62.31	97	Cambodia	3.91	34.85
32	Costa Rica	4.82	61.91	98	Egypt	3.89	34.32
33	South Africa	4.81	61.76	99	Moldova, Rep.	3.89	34.22
34	France	4.79	61.19	100	Italy	3.89	34.16
35	India	4.73	59.28	101	Ecuador	3.88	33.92
36	Saudi Arabia	4.72	58.98	102	Burundi	3.88	33.89
37	Malta	4.68	57.84	103	Cabo Verde	3.85	33.08
38	Bahrain	4.67	57.66	104	Romania	3.84	32.87
39	Kenya	4.65	57.06	105	Viet Nam	3.84	32.81
40	Chile	4.58	55.00	106	Nepal	3.82	32.34
41	Rwanda	4.57	54.65	107	Madagascar	3.82	32.32
42	Nigeria	4.55	54.00	108	El Salvador	3.82	32.15
43	Namibia	4.55	53.94	109	Bangladesh	3.81	31.86
44	Mauritius	4.54	53.61	110	Côte d'Ivoire	3.80	31.72
45	Ghana	4.53	53.30	111	Montenegro	3.79	31.35
46	Latvia	4.52	53.14	112	Tunisia	3.78	30.97
47	China	4.51	52.72	113	Nicaragua	3.77	30.78
48	Eswatini	4.51	52.67	114	North Macedonia	3.73	29.44
49	Slovenia	4.50	52.54	115	Cameroon	3.63	26.50
50	Zambia	4.50	52.53	116	Senegal	3.61	25.95
51	Bhutan	4.49	52.21	117	Mali	3.58	25.14
52	Brunei Darussalam	4.48	52.03	118	Croatia	3.56	24.60
53	Guatemala	4.47	51.73	119	Bolivia, Plurinational St.	3.56	24.40
54	Azerbaijan	4.46	51.44	120	Kyrgyzstan	3.54	23.81
55	Trinidad and Tobago	4.46	51.33	121	Paraguay	3.53	23.43
56	Zimbabwe	4.46	51.16	122	Mozambique	3.42	20.16
57	Thailand	4.45	50.95	123	Bosnia and Herzegovina	3.39	19.55
58	Slovakia	4.43	50.53	124	Ethiopia	3.39	19.50
59	Brazil	4.39	49.34	125	Iran, Islamic Rep.	3.38	19.17
60	Botswana	4.39	49.26	126	Congo, Dem. Rep.	3.35	18.28
61	Spain	4.38	49.01	127	Lesotho	3.33	17.58
62	Honduras	4.36	48.27	128	Burkina Faso	3.28	16.17
63	Mexico	4.36	48.19	129	Mongolia	3.21	13.91
64	Colombia	4.34	47.64	130	Algeria	3.07	10.00
65	Uganda	4.29	46.17	131	Yemen	2.75	0.37
66	Sri Lanka	4.26	45.38	132	Angola	2.74	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.3.2 Personal rights

Personal rights indicator | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Norway.....	98.20	100.00	67	Nigeria.....	77.57	73.60
2	Portugal.....	97.26	98.80	68	Bolivia, Plurinational St.....	76.88	72.72
3	Finland.....	97.15	98.66	69	Philippines.....	76.74	72.54
4	Sweden.....	97.11	98.61	70	Bhutan.....	76.55	72.30
5	Germany.....	96.74	98.13	71	Sri Lanka.....	76.35	72.04
6	Australia.....	96.64	98.00	72	Armenia.....	75.71	71.22
7	Netherlands.....	96.55	97.89	73	India.....	75.48	70.93
8	Switzerland.....	96.37	97.66	74	El Salvador.....	75.04	70.36
9	Belgium.....	96.20	97.44	75	Montenegro.....	74.72	69.96
10	Estonia.....	96.08	97.29	76	Malaysia.....	74.47	69.64
11	New Zealand.....	96.06	97.26	77	North Macedonia.....	73.56	68.47
12	Slovenia.....	95.63	96.71	78	Madagascar.....	73.26	68.09
13	Canada.....	95.61	96.69	79	Malawi.....	72.82	67.52
14	Denmark.....	95.52	96.57	80	Burkina Faso.....	72.80	67.50
15	Luxembourg.....	95.46	96.49	81	Serbia.....	72.19	66.72
16	Uruguay.....	95.24	96.21	82	Singapore.....	71.73	66.13
17	Iceland.....	95.17	96.12	83	Bosnia and Herzegovina.....	71.27	65.54
18	Spain.....	95.15	96.10	84	Honduras.....	70.13	64.08
19	Italy.....	95.09	96.02	85	Nepal.....	69.52	63.30
20	Costa Rica.....	94.80	95.65	86	Lesotho.....	69.06	62.71
21	Japan.....	94.45	95.20	87	Côte d'Ivoire.....	67.42	60.61
22	United Kingdom.....	94.36	95.09	88	Ukraine.....	66.98	60.05
23	Ireland.....	94.27	94.97	89	Kyrgyzstan.....	66.66	59.64
24	France.....	94.03	94.66	90	Mozambique.....	65.44	58.08
25	Latvia.....	93.88	94.47	91	Colombia.....	65.19	57.76
26	Lithuania.....	93.85	94.43	92	Tanzania, United Rep.....	65.14	57.70
27	Korea, Rep.....	93.55	94.05	93	Kuwait.....	64.44	56.80
28	Cyprus.....	93.15	93.54	94	Zambia.....	64.07	56.33
29	Czech Republic.....	92.71	92.98	95	Guatemala.....	62.98	54.93
30	Argentina.....	92.13	92.23	96	Morocco.....	62.72	54.60
31	United States of America.....	91.58	91.53	97	Mali.....	61.86	53.50
32	Mauritius.....	91.49	91.41	98	Jordan.....	61.53	53.08
33	Austria.....	91.48	91.40	99	Kenya.....	60.31	51.52
34	Trinidad and Tobago.....	91.14	90.97	99	Rwanda.....	60.31	51.52
35	Chile.....	91.05	90.85	101	Uganda.....	58.89	49.70
36	Ghana.....	90.22	89.79	102	Bangladesh.....	57.41	47.81
37	Jamaica.....	90.01	89.52	103	Angola.....	56.86	47.10
38	Cabo Verde.....	89.54	88.92	104	Algeria.....	55.94	45.92
38	Mongolia.....	89.54	88.92	105	Cameroon.....	55.58	45.46
40	Malta.....	88.89	88.09	106	Oman.....	52.62	41.68
41	Slovakia.....	88.14	87.13	107	Zimbabwe.....	52.41	41.41
42	Greece.....	87.36	86.13	108	Kazakhstan.....	51.47	40.20
43	Panama.....	86.10	84.52	109	Russian Federation.....	51.37	40.08
44	Tunisia.....	85.77	84.09	110	Ethiopia.....	50.01	38.34
45	Romania.....	85.58	83.85	111	Pakistan.....	49.09	37.16
46	Croatia.....	85.30	83.49	112	Viet Nam.....	47.51	35.14
47	Poland.....	85.08	83.21	113	Venezuela, Bolivarian Rep.....	45.83	32.99
48	Israel.....	85.00	83.11	114	United Arab Emirates.....	44.59	31.40
49	Botswana.....	84.35	82.28	115	Thailand.....	44.29	31.02
50	Bulgaria.....	84.18	82.06	116	Cambodia.....	43.35	29.81
51	Namibia.....	83.69	81.43	117	Egypt.....	40.81	26.56
52	Albania.....	82.85	80.36	118	Nicaragua.....	40.19	25.77
53	Dominican Republic.....	82.77	80.26	119	Turkey.....	39.35	24.70
54	Georgia.....	82.58	80.01	120	Eswatini.....	38.93	24.16
55	Senegal.....	82.38	79.76	121	Iran, Islamic Rep.....	38.88	24.09
56	Hungary.....	82.25	79.59	122	Azerbaijan.....	38.19	23.21
57	Gambia.....	81.67	78.85	123	Qatar.....	37.55	22.39
58	Brazil.....	81.13	78.16	124	Congo, Dem. Rep.....	36.36	20.87
59	South Africa.....	81.03	78.03	125	Burundi.....	33.76	17.54
60	Liberia.....	81.00	77.99	126	Lao PDR.....	29.08	11.55
61	Moldova, Rep.....	80.92	77.89	127	Bahrain.....	26.30	8.00
62	Ecuador.....	80.51	77.36	128	China.....	25.48	6.95
63	Peru.....	79.83	76.49	129	Tajikistan.....	23.79	4.79
64	Paraguay.....	78.32	74.56	130	Saudi Arabia.....	21.79	2.23
65	Indonesia.....	78.25	74.47	131	Yemen.....	20.05	0.00
66	Mexico.....	77.68	73.74		Brunei Darussalam.....	n/a	n/a

SOURCE: Social Progress Imperative, The Social Progress Index 2019 (<https://www.socialprogress.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.3.3 Use of virtual social networks

Average answer to the question: In your country, how widely are virtual social networks used (e.g., Facebook, Twitter, LinkedIn)? [1 = not at all used; 7 = used extensively] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Iceland	6.58	100.00	67	Serbia	5.64	73.51
2	Israel	6.55	99.07	68	Mexico	5.64	73.50
3	Netherlands	6.51	98.10	69	Albania	5.64	73.45
4	United Kingdom	6.49	97.47	70	Morocco	5.60	72.19
5	Philippines	6.47	96.80	71	Moldova, Rep.	5.58	71.62
6	Sweden	6.45	96.42	72	Austria	5.57	71.35
7	Singapore	6.43	95.69	73	Côte d'Ivoire	5.56	71.31
8	Canada	6.33	92.96	74	Oman	5.56	71.27
9	Finland	6.33	92.91	75	Dominican Republic	5.56	71.11
10	Malta	6.30	92.11	76	Bulgaria	5.55	71.03
11	Saudi Arabia	6.27	91.28	77	Armenia	5.54	70.55
12	Costa Rica	6.25	90.83	78	Kuwait	5.54	70.51
13	Lithuania	6.23	90.19	79	Cambodia	5.53	70.48
14	Thailand	6.21	89.70	80	Honduras	5.53	70.28
15	Bahrain	6.21	89.65	81	Venezuela, Bolivarian Rep.	5.51	69.77
16	Belgium	6.18	88.79	82	Nigeria	5.50	69.49
17	Brunei Darussalam	6.18	88.64	83	Namibia	5.49	69.30
18	Italy	6.17	88.57	84	Croatia	5.47	68.72
19	United States of America	6.17	88.45	85	Paraguay	5.44	67.86
20	Ireland	6.15	87.99	86	Ecuador	5.43	67.44
21	Japan	6.15	87.95	87	Viet Nam	5.42	67.34
22	Azerbaijan	6.14	87.54	88	Bosnia and Herzegovina	5.41	67.07
23	Norway	6.12	86.95	89	Peru	5.39	66.43
24	Malaysia	6.10	86.57	90	Sri Lanka	5.39	66.29
25	Luxembourg	6.09	86.06	91	El Salvador	5.38	66.06
26	Estonia	6.08	85.93	92	Hungary	5.37	65.78
27	Jordan	6.08	85.90	93	Algeria	5.36	65.49
28	Czech Republic	6.08	85.87	94	Greece	5.34	64.85
29	New Zealand	6.07	85.50	95	Colombia	5.30	63.95
30	Montenegro	6.06	85.31	96	Zambia	5.30	63.88
31	Egypt	6.06	85.28	97	Russian Federation	5.22	61.57
32	Australia	6.05	85.10	98	Cabo Verde	5.19	60.64
33	Turkey	6.05	85.07	99	Kazakhstan	5.16	59.96
34	Chile	6.05	84.96	100	Lao PDR	5.16	59.85
35	Switzerland	6.04	84.80	101	Ukraine	5.15	59.73
36	Korea, Rep.	6.04	84.68	102	Botswana	5.14	59.41
37	Denmark	6.01	83.86	103	Bhutan	5.13	59.18
38	Indonesia	5.99	83.36	104	India	5.12	58.89
39	France	5.97	82.89	105	Madagascar	5.08	57.61
40	Slovenia	5.95	82.27	106	Nepal	5.04	56.59
41	Panama	5.94	81.82	107	Bangladesh	5.03	56.29
42	Spain	5.92	81.49	108	Zimbabwe	5.02	56.01
43	North Macedonia	5.91	81.14	109	Bolivia, Plurinational St.	5.00	55.36
44	Brazil	5.91	80.99	110	Ghana	5.00	55.28
45	Guatemala	5.90	80.92	111	Rwanda	4.92	52.98
46	Tunisia	5.90	80.80	112	Liberia	4.89	52.32
47	Kenya	5.90	80.79	113	Cameroon	4.89	52.28
48	Romania	5.90	80.78	114	Uganda	4.82	50.32
49	Jamaica	5.89	80.60	115	Nicaragua	4.82	50.28
50	South Africa	5.87	80.03	116	Yemen	4.71	47.02
51	Portugal	5.87	79.94	117	Tanzania, United Rep.	4.69	46.63
52	Latvia	5.86	79.82	118	Mozambique	4.64	45.31
53	Germany	5.86	79.59	119	Mali	4.61	44.21
54	United Arab Emirates	5.84	79.00	120	Burkina Faso	4.60	44.13
55	Mauritius	5.83	78.92	121	China	4.60	44.12
56	Trinidad and Tobago	5.80	77.97	122	Pakistan	4.57	43.31
57	Gambia	5.77	77.00	123	Angola	4.54	42.31
58	Cyprus	5.75	76.58	124	Iran, Islamic Rep.	4.50	41.10
59	Uruguay	5.74	76.35	125	Tajikistan	4.35	37.01
60	Mongolia	5.71	75.36	126	Eswatini	4.27	34.83
61	Slovakia	5.70	75.03	127	Congo, Dem. Rep.	4.27	34.68
62	Senegal	5.68	74.73	128	Kyrgyzstan	4.25	34.04
63	Georgia	5.68	74.58	129	Malawi	4.24	34.00
64	Argentina	5.67	74.16	130	Ethiopia	3.80	21.40
65	Poland	5.65	73.84	131	Burundi	3.65	17.29
66	Qatar	5.64	73.56	132	Lesotho	3.04	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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3.3.4 Use of virtual professional networks

LinkedIn users (per 1,000 labour force) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United Arab Emirates	1,172.33	100.00	67	Egypt	103.57	8.50
2	United States of America	929.39	79.20	68	Serbia	99.39	8.14
3	Singapore	896.06	76.35	69	Germany	95.47	7.80
4	Netherlands	780.73	66.47	70	Dominican Republic	91.98	7.51
5	United Kingdom	751.22	63.95	71	El Salvador	89.06	7.26
6	Australia	731.41	62.25	72	Morocco	86.59	7.04
7	Canada	712.00	60.59	73	Poland	83.13	6.75
8	Denmark	669.34	56.94	74	Indonesia	78.04	6.31
9	Iceland	642.66	54.65	75	Bosnia and Herzegovina	75.22	6.07
10	Belgium	602.89	51.25	76	Korea, Rep.	72.52	5.84
11	Malta	568.69	48.32	77	Bhutan	68.95	5.53
12	Sweden	557.31	47.34	78	Nicaragua	68.73	5.52
13	France	539.74	45.84	79	Guatemala	68.63	5.51
14	Luxembourg	532.06	45.18	80	Russian Federation	65.23	5.22
15	Ireland	456.00	38.67	81	Georgia	64.20	5.13
16	Chile	449.69	38.13	82	Bolivia, Plurinational St.	62.48	4.98
17	Spain	439.91	37.29	83	Eswatini	59.92	4.76
18	Italy	426.85	36.18	84	Sri Lanka	59.83	4.75
19	New Zealand	407.00	34.48	85	Paraguay	59.09	4.69
20	Portugal	387.90	32.84	86	Honduras	59.04	4.69
21	Finland	372.44	31.52	87	Armenia	58.29	4.62
22	Norway	362.45	30.66	88	Ukraine	57.65	4.57
23	Argentina	355.91	30.10	89	Kenya	56.10	4.43
24	Trinidad and Tobago	329.61	27.85	90	Algeria	52.63	4.14
25	Switzerland	325.83	27.53	91	Mongolia	51.85	4.07
26	Brazil	321.45	27.15	92	Ghana	50.07	3.92
27	Malaysia	272.70	22.98	93	Kazakhstan	45.81	3.55
28	Israel	271.89	22.91	94	Senegal	37.68	2.86
29	South Africa	266.43	22.44	95	Pakistan	35.04	2.63
30	Cyprus	259.67	21.86	96	Zimbabwe	35.02	2.63
31	Colombia	246.54	20.74	97	Côte d'Ivoire	34.97	2.62
32	Uruguay	239.88	20.17	98	Gambia	34.25	2.56
33	Qatar	230.78	19.39	99	Japan	31.66	2.34
34	Romania	222.74	18.70	100	Nigeria	31.53	2.33
35	Bahrain	215.28	18.06	101	Azerbaijan	28.56	2.08
36	Costa Rica	215.02	18.04	102	Cameroon	28.55	2.08
37	Mauritius	208.28	17.46	103	Lesotho	28.46	2.07
38	Mexico	202.97	17.01	104	Zambia	27.81	2.01
39	Slovenia	198.42	16.62	105	Thailand	26.35	1.89
40	Jamaica	194.18	16.26	106	Liberia	24.33	1.71
41	Turkey	190.46	15.94	107	Angola	23.69	1.66
42	Croatia	188.98	15.81	108	Uganda	21.64	1.48
43	Czech Republic	186.92	15.63	109	Cambodia	17.96	1.17
44	Latvia	184.67	15.44	110	Nepal	17.50	1.13
45	Estonia	184.08	15.39	111	Kyrgyzstan	17.23	1.11
46	Panama	180.82	15.11	112	Viet Nam	16.03	1.00
47	Greece	180.18	15.06	113	Rwanda	15.48	0.96
48	Brunei Darussalam	173.23	14.46	114	Peru	14.78	0.90
49	Jordan	167.37	13.96	115	Mali	13.05	0.75
50	Saudi Arabia	161.49	13.46	116	Mozambique	11.95	0.65
51	Kuwait	161.09	13.42	117	Yemen	11.20	0.59
52	Venezuela, Bolivarian Rep.	147.55	12.26	118	Burkina Faso	11.15	0.59
53	Ecuador	144.61	12.01	119	Malawi	10.81	0.56
54	Lithuania	139.38	11.56	120	Bangladesh	10.40	0.52
55	Philippines	138.37	11.48	121	China	9.05	0.41
56	Austria	137.01	11.36	122	Madagascar	6.56	0.19
57	Montenegro	134.99	11.19	123	Tajikistan	5.51	0.10
58	Bulgaria	127.62	10.56	124	Burundi	5.31	0.09
59	Botswana	122.14	10.09	125	Congo, Dem. Rep.	4.54	0.02
60	Oman	120.71	9.97	126	Ethiopia	4.31	0.00
61	Hungary	119.99	9.90		Cabo Verde	n/a	n/a
62	India	119.34	9.85		Iran, Islamic Rep.	n/a	n/a
63	Namibia	117.25	9.67		Lao PDR	n/a	n/a
64	Tunisia	110.90	9.13		Moldova, Rep.	n/a	n/a
65	Slovakia	109.86	9.04		North Macedonia	n/a	n/a
66	Albania	107.81	8.86		Tanzania, United Rep.	n/a	n/a

SOURCE: Data on LinkedIn users kindly provided by LinkedIn. Data on labour force are sourced from the International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)
For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.3.5 Collaboration within organisations

Average answer to the question: In your country, to what extent do people collaborate and share ideas within a company? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	5.84	100.00	67	Nigeria.....	4.05	47.57
2	United States of America.....	5.74	96.93	68	Cyprus.....	4.02	46.66
3	Israel.....	5.63	93.92	69	Cameroon.....	4.01	46.40
4	Sweden.....	5.63	93.72	70	Mali.....	4.00	46.19
5	Germany.....	5.55	91.54	71	Slovakia.....	3.99	45.80
6	Netherlands.....	5.49	89.86	72	Bulgaria.....	3.99	45.74
7	Denmark.....	5.44	88.36	73	Serbia.....	3.97	45.29
8	Finland.....	5.37	86.27	74	Tanzania, United Rep.	3.97	45.28
9	Norway.....	5.36	85.83	75	Mauritius.....	3.96	45.02
10	Iceland.....	5.34	85.39	76	Liberia.....	3.95	44.72
11	Malaysia.....	5.34	85.27	77	Namibia.....	3.94	44.49
12	Austria.....	5.29	84.00	78	Brazil.....	3.94	44.48
13	Luxembourg.....	5.21	81.41	79	Morocco.....	3.94	44.48
14	Japan.....	5.14	79.61	80	Burkina Faso.....	3.94	44.44
15	Belgium.....	5.14	79.54	81	Kyrgyzstan.....	3.94	44.27
16	New Zealand.....	5.14	79.52	82	Venezuela, Bolivarian Rep.....	3.93	44.23
17	Qatar.....	5.08	77.81	83	Kuwait.....	3.91	43.55
18	Singapore.....	5.07	77.59	84	Madagascar.....	3.90	43.28
19	Ireland.....	5.05	76.74	85	Latvia.....	3.90	43.11
20	Canada.....	5.05	76.73	86	Burundi.....	3.88	42.77
21	Philippines.....	5.04	76.67	87	Panama.....	3.88	42.75
22	United Kingdom.....	5.03	76.41	88	Sri Lanka.....	3.88	42.70
23	Australia.....	4.93	73.32	89	Tunisia.....	3.87	42.45
24	Indonesia.....	4.86	71.27	90	Moldova, Rep.	3.86	41.95
25	United Arab Emirates.....	4.84	70.66	91	Italy.....	3.83	41.05
26	France.....	4.71	66.88	92	Chile.....	3.82	40.99
27	India.....	4.67	65.68	93	Mexico.....	3.82	40.92
28	Oman.....	4.64	64.86	94	Egypt.....	3.82	40.91
29	Azerbaijan.....	4.61	64.09	95	Colombia.....	3.78	39.81
30	Estonia.....	4.57	62.78	96	Turkey.....	3.76	39.13
31	Bahrain.....	4.55	62.32	97	Congo, Dem. Rep.	3.74	38.68
32	China.....	4.51	61.09	98	Dominican Republic.....	3.74	38.44
33	Czech Republic.....	4.51	61.09	99	Zambia.....	3.70	37.38
34	Kenya.....	4.50	60.66	100	Greece.....	3.67	36.48
35	Lithuania.....	4.49	60.42	101	Spain.....	3.66	36.11
36	Rwanda.....	4.46	59.52	102	Ethiopia.....	3.63	35.35
37	Korea, Rep.	4.44	58.98	103	Argentina.....	3.62	35.12
38	Russian Federation.....	4.42	58.47	104	Botswana.....	3.60	34.61
39	Côte d'Ivoire.....	4.41	58.26	105	Hungary.....	3.58	33.89
40	Slovenia.....	4.38	57.38	106	Cabo Verde.....	3.58	33.86
41	Saudi Arabia.....	4.35	56.50	107	Eswatini.....	3.58	33.82
42	Malta.....	4.31	55.18	108	Brunei Darussalam.....	3.56	33.24
43	Mongolia.....	4.27	53.97	109	Bangladesh.....	3.55	33.09
44	Ukraine.....	4.24	53.22	110	Zimbabwe.....	3.53	32.29
45	Ghana.....	4.24	53.19	111	Viet Nam.....	3.52	32.00
46	Tajikistan.....	4.24	53.17	112	Uruguay.....	3.51	31.86
47	Costa Rica.....	4.21	52.39	113	Ecuador.....	3.48	30.84
48	Thailand.....	4.21	52.25	114	Bosnia and Herzegovina.....	3.47	30.75
49	Gambia.....	4.20	52.13	115	Nepal.....	3.47	30.62
50	Senegal.....	4.20	52.06	116	Peru.....	3.46	30.49
51	South Africa.....	4.17	51.13	117	Iran, Islamic Rep.....	3.46	30.25
52	Montenegro.....	4.17	51.10	118	Trinidad and Tobago.....	3.46	30.25
53	Uganda.....	4.16	50.70	119	Paraguay.....	3.41	28.78
54	Guatemala.....	4.15	50.52	120	North Macedonia.....	3.40	28.62
55	Armenia.....	4.14	50.26	121	Poland.....	3.40	28.49
56	Jamaica.....	4.13	50.03	122	Nicaragua.....	3.39	28.24
57	Kazakhstan.....	4.13	49.84	123	Croatia.....	3.38	28.08
58	Cambodia.....	4.12	49.58	124	Romania.....	3.37	27.70
59	Lao PDR.....	4.11	49.41	125	Mozambique.....	3.35	27.24
60	Portugal.....	4.10	49.14	126	Malawi.....	3.35	27.07
61	Jordan.....	4.09	48.65	127	Lesotho.....	3.30	25.72
62	Bhutan.....	4.07	48.28	128	Algeria.....	3.30	25.65
63	Albania.....	4.06	47.97	129	El Salvador.....	3.17	21.84
64	Honduras.....	4.06	47.92	130	Bolivia, Plurinational St.....	3.15	21.42
65	Pakistan.....	4.06	47.82	131	Yemen.....	2.96	15.63
66	Georgia.....	4.06	47.82	132	Angola.....	2.42	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

3.3.6 Collaboration across organisations

Average answer to the question: In your country, to what extent do companies collaborate in sharing ideas and innovating? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	5.67	100.00	67	Cambodia.....	3.40	39.46
2	Germany.....	5.29	89.94	68	Armenia.....	3.39	39.29
3	Malaysia.....	5.27	89.30	69	Chile.....	3.39	39.20
4	Israel.....	5.06	83.58	70	Italy.....	3.37	38.83
5	Netherlands.....	4.98	81.64	71	Turkey.....	3.37	38.71
6	Sweden.....	4.96	81.08	72	Honduras.....	3.36	38.58
7	Finland.....	4.96	81.02	73	Colombia.....	3.36	38.40
8	Switzerland.....	4.93	80.32	74	Jamaica.....	3.34	38.11
9	United Kingdom.....	4.75	75.60	75	Panama.....	3.33	37.68
10	Indonesia.....	4.75	75.52	76	Argentina.....	3.27	36.24
11	Qatar.....	4.63	72.40	77	Serbia.....	3.24	35.31
12	United Arab Emirates.....	4.53	69.61	78	Cabo Verde.....	3.23	35.18
13	Luxembourg.....	4.50	68.91	79	Mali.....	3.22	34.82
14	India.....	4.50	68.81	80	Latvia.....	3.18	33.86
15	China.....	4.40	66.29	81	Namibia.....	3.18	33.83
16	Singapore.....	4.40	66.20	82	Algeria.....	3.17	33.39
17	Denmark.....	4.39	65.89	83	Senegal.....	3.16	33.24
18	Azerbaijan.....	4.37	65.25	84	Uganda.....	3.16	33.24
19	New Zealand.....	4.36	65.08	85	Mauritius.....	3.13	32.43
20	Iceland.....	4.27	62.78	86	Madagascar.....	3.13	32.39
21	Japan.....	4.26	62.50	87	Spain.....	3.10	31.73
22	Philippines.....	4.25	62.27	88	Venezuela, Bolivarian Rep.....	3.07	30.74
23	Ireland.....	4.22	61.37	89	Viet Nam.....	3.05	30.20
24	Austria.....	4.21	60.99	90	Georgia.....	3.04	29.99
25	Korea, Rep.....	4.19	60.61	91	Gambia.....	3.04	29.95
26	Norway.....	4.18	60.31	92	Liberia.....	3.03	29.87
27	Saudi Arabia.....	4.15	59.51	93	Brunei Darussalam.....	3.02	29.58
28	Belgium.....	4.14	59.17	94	Nepal.....	3.00	29.05
29	Oman.....	4.09	57.88	95	Cyprus.....	3.00	28.99
30	Canada.....	4.06	57.06	96	Burundi.....	3.00	28.98
31	Kenya.....	3.99	55.27	97	Mozambique.....	2.99	28.77
32	Rwanda.....	3.88	52.27	98	Uruguay.....	2.97	28.18
33	South Africa.....	3.79	50.03	99	Ecuador.....	2.97	28.07
34	Jordan.....	3.79	49.90	100	Zambia.....	2.96	28.01
35	Tajikistan.....	3.78	49.66	101	Congo, Dem. Rep.....	2.94	27.44
36	Pakistan.....	3.76	49.08	102	Cameroon.....	2.93	27.03
37	Bahrain.....	3.74	48.65	103	Paraguay.....	2.91	26.58
38	Lao PDR.....	3.73	48.43	104	Dominican Republic.....	2.90	26.37
39	Australia.....	3.73	48.33	105	Kyrgyzstan.....	2.88	25.87
40	Portugal.....	3.72	48.00	106	Botswana.....	2.87	25.51
41	Ghana.....	3.72	47.98	107	Peru.....	2.87	25.49
42	Russian Federation.....	3.71	47.77	108	Romania.....	2.85	24.98
43	France.....	3.69	47.32	109	Morocco.....	2.85	24.88
44	Lithuania.....	3.69	47.25	110	Iran, Islamic Rep.....	2.82	24.07
45	Egypt.....	3.68	47.13	111	Burkina Faso.....	2.79	23.34
46	Kuwait.....	3.65	46.25	112	Greece.....	2.78	23.16
47	Slovakia.....	3.62	45.48	113	Tunisia.....	2.78	23.10
48	Estonia.....	3.60	44.95	114	Poland.....	2.77	22.94
49	Kazakhstan.....	3.58	44.29	115	Eswatini.....	2.76	22.48
50	Thailand.....	3.57	44.07	116	Bangladesh.....	2.74	21.95
51	Costa Rica.....	3.56	43.72	117	Nigeria.....	2.73	21.78
52	Bhutan.....	3.55	43.58	118	Zimbabwe.....	2.71	21.22
53	Czech Republic.....	3.55	43.50	119	North Macedonia.....	2.70	20.91
54	Guatemala.....	3.54	43.41	120	Bolivia, Plurinational St.....	2.67	20.09
55	Tanzania, United Rep.....	3.51	42.52	121	Moldova, Rep.....	2.65	19.58
56	Montenegro.....	3.48	41.66	122	Côte d'Ivoire.....	2.62	18.87
57	Ukraine.....	3.48	41.62	123	Nicaragua.....	2.61	18.50
58	Brazil.....	3.47	41.34	124	Trinidad and Tobago.....	2.61	18.48
59	Mexico.....	3.46	41.14	125	Malawi.....	2.57	17.44
60	Slovenia.....	3.43	40.51	126	Bosnia and Herzegovina.....	2.56	17.22
61	Albania.....	3.43	40.49	127	Mongolia.....	2.55	16.93
62	Ethiopia.....	3.42	40.21	128	Yemen.....	2.53	16.55
63	Lesotho.....	3.42	40.12	129	Croatia.....	2.49	15.49
64	Malta.....	3.41	39.88	130	Hungary.....	2.43	13.71
65	Bulgaria.....	3.40	39.65	131	El Salvador.....	2.42	13.56
66	Sri Lanka.....	3.40	39.65	132	Angola.....	1.91	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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Pillar 4

Retain

4.1.1 Pension system

Workforce contributing to pension system (%) | 2015

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Ireland	100.00	100.00	67	Thailand	31.90	31.90
1	Israel	100.00	100.00	68	Philippines	30.86	30.86
1	Japan	100.00	100.00	69	Colombia	30.83	30.83
1	Kazakhstan	100.00	100.00	70	Morocco	30.20	30.20
1	Luxembourg	100.00	100.00	71	Georgia	29.50	29.50
1	United States of America	100.00	100.00	72	El Salvador	29.31	29.31
7	Denmark	96.60	96.60	73	Tajikistan	28.56	28.56
8	Malta	94.65	94.65	74	Mexico	27.55	27.55
9	Norway	94.09	94.09	75	Eswatini	25.50	25.50
10	Italy	93.37	93.37	76	Cabo Verde	24.39	24.39
11	Latvia	92.59	92.59	77	Peru	24.28	24.28
12	Czech Republic	92.00	92.00	78	Viet Nam	23.50	23.50
13	Belgium	91.99	91.99	79	Nicaragua	21.02	21.02
14	Netherlands	91.40	91.40	80	Guatemala	19.70	19.70
15	Australia	88.80	88.80	81	Paraguay	18.90	18.90
16	Austria	88.56	88.56	82	Kuwait	18.40	18.40
17	France	88.56	88.56	83	Zimbabwe	18.30	18.30
18	Poland	88.00	88.00	84	Honduras	17.30	17.30
19	Hungary	87.52	87.52	85	Bolivia, Plurinational St.	16.66	16.66
20	Greece	86.60	86.60	86	Kenya	16.30	16.30
21	Germany	86.02	86.02	87	Botswana	15.50	15.50
22	Bulgaria	84.97	84.97	88	Congo, Dem. Rep.	14.00	14.00
23	Finland	84.89	84.89	89	India	13.70	13.70
24	Slovakia	84.39	84.39	89	Oman	13.70	13.70
25	Slovenia	83.27	83.27	91	Nigeria	12.86	12.86
26	Estonia	82.30	82.30	92	Gambia	12.49	12.49
27	North Macedonia	80.00	80.00	93	Zambia	12.20	12.20
28	Sweden	79.30	79.30	94	Bhutan	12.10	12.10
29	Korea, Rep.	77.80	77.80	95	Indonesia	10.50	10.50
30	Croatia	77.00	77.00	96	Ghana	9.00	9.00
31	Lithuania	76.00	76.00	97	Côte d'Ivoire	8.80	8.80
32	Spain	74.98	74.98	98	Cameroon	8.74	8.74
33	Mongolia	74.50	74.50	99	Namibia	8.20	8.20
33	Portugal	74.50	74.50	100	South Africa	6.30	6.30
35	Costa Rica	71.92	71.92	101	Madagascar	6.20	6.20
36	Canada	71.07	71.07	102	Pakistan	5.98	5.98
37	Uruguay	70.80	70.80	103	Mozambique	5.80	5.80
38	Moldova, Rep.	70.10	70.10	104	Yemen	5.20	5.20
39	China	69.80	69.80	105	Burundi	5.18	5.18
40	Trinidad and Tobago	68.80	68.80	106	Malawi	4.33	4.33
41	Cyprus	67.36	67.36	107	Rwanda	4.30	4.30
42	Russian Federation	65.90	65.90	107	Tanzania, United Rep.	4.30	4.30
43	Romania	64.57	64.57	109	Qatar	3.90	3.90
44	Singapore	61.67	61.67	110	Lesotho	3.80	3.80
45	Serbia	61.10	61.10	111	Mali	3.32	3.32
46	Tunisia	61.00	61.00	112	Nepal	2.80	2.80
47	Mauritius	60.90	60.90	113	Senegal	2.76	2.76
48	Chile	60.00	60.00	114	Burkina Faso	2.26	2.26
49	Egypt	53.60	53.60	115	Lao PDR	1.60	1.60
50	Brazil	52.48	52.48	116	Angola	1.25	1.25
51	Turkey	52.12	52.12	117	Bangladesh	0.85	0.85
52	Kyrgyzstan	51.94	51.94	118	Liberia	0.26	0.26
53	Jordan	51.50	51.50	119	Cambodia	0.00	0.00
54	Argentina	50.20	50.20		Albania	n/a	n/a
55	Saudi Arabia	50.10	50.10		Azerbaijan	n/a	n/a
56	Panama	48.73	48.73		Bahrain	n/a	n/a
57	Ukraine	47.06	47.06		Brunei Darussalam	n/a	n/a
58	Bosnia and Herzegovina	44.60	44.60		Ethiopia	n/a	n/a
59	Malaysia	43.20	43.20		Iceland	n/a	n/a
60	Ecuador	42.05	42.05		Jamaica	n/a	n/a
61	Algeria	41.03	41.03		Montenegro	n/a	n/a
62	Iran, Islamic Rep.	39.30	39.30		New Zealand	n/a	n/a
63	Armenia	36.92	36.92		Switzerland	n/a	n/a
64	Venezuela, Bolivarian Rep.	33.90	33.90		Uganda	n/a	n/a
65	Sri Lanka	32.10	32.10		United Arab Emirates	n/a	n/a
66	Dominican Republic	32.06	32.06		United Kingdom	n/a	n/a

SOURCE: International Labour Organization, *World Social Protection Report 2017–19* (<https://www.social-protection.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

4.1.2 Social protection

Average answer to the question: In your country, to what extent does a formal social safety net provide protection to the general population from economic insecurity in the event of job loss or disability? [1 = not at all; 7 = provides full protection] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Norway.....	6.20	100.00	67	Colombia.....	3.80	42.74
2	Denmark.....	6.17	99.20	68	Egypt.....	3.77	42.06
3	Luxembourg.....	6.17	99.11	69	Kenya.....	3.75	41.55
4	Austria.....	6.16	99.05	70	Kazakhstan.....	3.73	41.09
5	Belgium.....	6.15	98.78	71	Algeria.....	3.72	40.86
6	France.....	6.14	98.51	72	Philippines.....	3.71	40.76
7	Finland.....	6.12	98.11	73	Montenegro.....	3.69	40.24
8	Switzerland.....	6.01	95.40	74	Cabo Verde.....	3.66	39.51
9	Netherlands.....	5.80	90.50	75	Pakistan.....	3.64	39.12
10	Iceland.....	5.71	88.25	76	Mali.....	3.63	38.69
11	United States of America.....	5.70	88.02	77	Sri Lanka.....	3.60	38.06
12	Australia.....	5.66	87.17	78	Mexico.....	3.59	37.82
13	Canada.....	5.61	85.80	79	Brazil.....	3.57	37.42
14	Sweden.....	5.59	85.34	80	Ukraine.....	3.56	37.24
15	Spain.....	5.56	84.78	81	South Africa.....	3.50	35.69
16	Oman.....	5.55	84.46	82	Ethiopia.....	3.46	34.79
17	New Zealand.....	5.54	84.19	83	Bolivia, Plurinational St.....	3.44	34.33
18	Japan.....	5.35	79.77	84	Tunisia.....	3.42	33.76
19	Germany.....	5.24	76.98	85	Albania.....	3.40	33.21
20	Uruguay.....	5.16	75.21	86	Lesotho.....	3.39	33.19
21	Malaysia.....	5.15	74.93	87	Russian Federation.....	3.39	33.15
22	United Kingdom.....	5.12	74.19	88	Bulgaria.....	3.38	32.80
23	Ireland.....	5.09	73.64	89	Dominican Republic.....	3.34	31.96
24	Malta.....	5.01	71.61	90	Nicaragua.....	3.34	31.96
25	Qatar.....	5.00	71.38	91	Mongolia.....	3.33	31.77
26	Czech Republic.....	4.96	70.38	92	Armenia.....	3.33	31.72
27	Slovenia.....	4.93	69.63	93	Zambia.....	3.31	31.21
28	Costa Rica.....	4.92	69.36	94	Lao PDR.....	3.30	30.98
29	Saudi Arabia.....	4.90	68.94	95	Kyrgyzstan.....	3.29	30.72
30	Bahrain.....	4.87	68.21	96	Serbia.....	3.28	30.47
31	Kuwait.....	4.78	66.17	97	Honduras.....	3.28	30.36
32	Portugal.....	4.78	66.06	98	Lithuania.....	3.26	29.94
33	Romania.....	4.75	65.38	99	Eswatini.....	3.24	29.51
34	United Arab Emirates.....	4.63	62.57	100	Liberia.....	3.23	29.39
35	Rwanda.....	4.59	61.55	101	Croatia.....	3.23	29.21
36	Israel.....	4.55	60.72	102	Guatemala.....	3.22	29.15
37	Singapore.....	4.52	59.91	103	Peru.....	3.20	28.64
38	Azerbaijan.....	4.52	59.90	104	Jamaica.....	3.19	28.30
39	China.....	4.49	59.37	105	Senegal.....	3.15	27.29
40	Indonesia.....	4.36	56.11	106	Burkina Faso.....	3.12	26.57
41	Turkey.....	4.35	56.03	107	Morocco.....	3.11	26.38
42	India.....	4.29	54.42	108	Greece.....	3.09	25.97
43	Korea, Rep.....	4.27	54.00	109	Paraguay.....	3.05	25.03
44	Cyprus.....	4.22	52.93	110	Mozambique.....	3.02	24.17
45	Estonia.....	4.20	52.28	111	Côte d'Ivoire.....	2.98	23.41
46	Italy.....	4.17	51.53	112	Cameroon.....	2.98	23.31
47	Mauritius.....	4.15	51.14	113	Hungary.....	2.95	22.61
48	Brunei Darussalam.....	4.13	50.80	114	Uganda.....	2.92	21.83
49	Bhutan.....	4.09	49.74	115	Cambodia.....	2.91	21.71
50	Chile.....	4.05	48.71	116	Malawi.....	2.89	21.21
51	Slovakia.....	4.04	48.48	117	Poland.....	2.87	20.63
52	Jordan.....	4.02	48.16	118	Moldova, Rep.....	2.84	20.02
53	Namibia.....	3.98	47.21	119	North Macedonia.....	2.78	18.48
54	Thailand.....	3.98	47.02	120	Nepal.....	2.77	18.29
55	Ecuador.....	3.96	46.66	121	Georgia.....	2.75	17.82
56	Panama.....	3.95	46.48	122	El Salvador.....	2.69	16.37
57	Tajikistan.....	3.95	46.33	123	Congo, Dem. Rep.....	2.69	16.34
58	Latvia.....	3.94	46.20	124	Burundi.....	2.62	14.81
59	Gambia.....	3.94	46.17	125	Madagascar.....	2.56	13.24
60	Botswana.....	3.93	45.93	126	Bangladesh.....	2.53	12.67
61	Argentina.....	3.91	45.54	127	Bosnia and Herzegovina.....	2.50	11.87
62	Trinidad and Tobago.....	3.88	44.70	128	Zimbabwe.....	2.37	8.77
63	Tanzania, United Rep.....	3.88	44.69	129	Angola.....	2.28	6.60
64	Iran, Islamic Rep.....	3.86	44.31	130	Venezuela, Bolivarian Rep.....	2.27	6.51
65	Ghana.....	3.82	43.23	131	Nigeria.....	2.07	1.76
66	Viet Nam.....	3.82	43.22	132	Yemen.....	2.00	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

4.1.3 Brain retention

Average answer to the question: To what extent does your country retain talented people? [1 = not at all—the best and brightest leave to pursue opportunities abroad; 7 = to a great extent—the best and brightest stay and pursue opportunities in the country] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	5.90	100.00	67	Peru.....	3.38	39.92
2	United States of America.....	5.81	97.76	68	Ethiopia.....	3.37	39.84
3	United Arab Emirates.....	5.52	91.08	69	Portugal.....	3.37	39.76
4	Singapore.....	5.45	89.29	70	Brazil.....	3.37	39.72
5	Luxembourg.....	5.41	88.32	71	Tanzania, United Rep.	3.35	39.32
6	Netherlands.....	5.27	84.98	72	Ecuador.....	3.34	38.97
7	United Kingdom.....	5.27	84.95	73	Viet Nam.....	3.31	38.38
8	Germany.....	5.17	82.68	74	Spain.....	3.30	38.14
9	Malaysia.....	5.10	80.86	75	Liberia.....	3.29	37.97
10	Iceland.....	5.05	79.82	76	Jamaica.....	3.25	36.99
11	Norway.....	5.05	79.74	77	Malawi.....	3.25	36.94
12	Sweden.....	5.01	78.80	78	South Africa.....	3.25	36.92
13	Finland.....	4.97	77.79	79	Kazakhstan.....	3.21	36.05
14	Oman.....	4.96	77.64	80	Georgia.....	3.20	35.86
15	Canada.....	4.95	77.29	81	Montenegro.....	3.17	34.99
16	Chile.....	4.90	76.28	82	Zambia.....	3.17	34.99
17	Qatar.....	4.90	76.26	83	Poland.....	3.16	34.74
18	Australia.....	4.74	72.30	84	Dominican Republic.....	3.13	33.99
19	Ireland.....	4.73	72.27	85	Senegal.....	3.12	33.73
20	Rwanda.....	4.72	72.03	86	Bangladesh.....	3.11	33.69
21	Denmark.....	4.72	71.85	87	Morocco.....	3.09	33.16
22	Israel.....	4.71	71.80	88	Armenia.....	3.08	32.85
23	India.....	4.70	71.56	89	Slovenia.....	3.08	32.83
24	Saudi Arabia.....	4.58	68.55	90	Nicaragua.....	3.07	32.65
25	Korea, Rep.....	4.56	68.21	91	Côte d'Ivoire.....	3.05	32.18
26	Azerbaijan.....	4.53	67.52	92	Nigeria.....	3.04	31.97
27	Indonesia.....	4.46	65.81	93	Eswatini.....	3.04	31.82
28	New Zealand.....	4.46	65.70	94	Uruguay.....	3.00	31.04
29	Bahrain.....	4.43	65.10	95	Egypt.....	2.99	30.86
30	Malta.....	4.38	63.72	96	Mali.....	2.98	30.44
31	Costa Rica.....	4.37	63.50	97	Mozambique.....	2.95	29.86
32	China.....	4.33	62.71	98	Burkina Faso.....	2.94	29.63
33	Panama.....	4.29	61.58	99	Italy.....	2.91	28.87
34	Austria.....	4.26	60.94	100	Uganda.....	2.90	28.69
35	Gambia.....	4.17	58.73	101	Latvia.....	2.89	28.44
36	Belgium.....	4.11	57.41	102	Sri Lanka.....	2.89	28.31
37	Bhutan.....	4.08	56.78	103	Turkey.....	2.86	27.67
38	Thailand.....	4.08	56.61	104	Madagascar.....	2.83	26.97
39	Kenya.....	4.06	56.23	105	Cameroon.....	2.73	24.68
40	Philippines.....	4.05	56.06	106	Bolivia, Plurinational St.....	2.73	24.58
41	Japan.....	4.04	55.70	107	Iran, Islamic Rep.....	2.67	23.12
42	Ghana.....	4.01	55.00	108	Lithuania.....	2.67	23.10
43	Pakistan.....	3.98	54.22	109	Congo, Dem. Rep.....	2.67	23.10
44	Cyprus.....	3.87	51.75	110	Nepal.....	2.66	23.00
45	Guatemala.....	3.81	50.30	111	Albania.....	2.63	22.29
46	Namibia.....	3.76	49.19	112	Hungary.....	2.63	22.26
47	Lao PDR.....	3.76	49.18	113	Tunisia.....	2.60	21.55
48	Czech Republic.....	3.76	49.12	114	Bulgaria.....	2.58	21.08
49	Argentina.....	3.72	48.08	115	Kyrgyzstan.....	2.56	20.57
50	Botswana.....	3.63	46.05	116	Angola.....	2.55	20.39
51	Tajikistan.....	3.57	44.66	117	Algeria.....	2.52	19.53
52	Lesotho.....	3.57	44.62	118	Ukraine.....	2.50	19.14
53	Russian Federation.....	3.56	44.26	119	Burundi.....	2.50	19.11
54	Kuwait.....	3.55	44.19	120	Slovakia.....	2.41	16.98
55	Jordan.....	3.55	44.12	121	Zimbabwe.....	2.40	16.71
56	Mauritius.....	3.55	44.02	122	Mongolia.....	2.39	16.50
57	Cambodia.....	3.54	43.76	123	Greece.....	2.38	16.17
58	Trinidad and Tobago.....	3.54	43.75	124	El Salvador.....	2.36	15.64
59	Brunei Darussalam.....	3.53	43.63	125	Serbia.....	2.27	13.57
60	Mexico.....	3.53	43.52	126	North Macedonia.....	2.13	10.18
61	Paraguay.....	3.46	41.84	127	Moldova, Rep.....	1.96	6.29
62	Estonia.....	3.45	41.74	128	Yemen.....	1.94	5.71
63	Honduras.....	3.44	41.50	129	Croatia.....	1.88	4.43
64	Cabo Verde.....	3.44	41.48	130	Romania.....	1.88	4.31
65	France.....	3.43	41.24	131	Bosnia and Herzegovina.....	1.76	1.55
66	Colombia.....	3.41	40.85	132	Venezuela, Bolivarian Rep.....	1.70	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

4.2.1 Environmental performance

Environmental Performance Index | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	87.42	100.00	67	Jamaica.....	58.58	51.93
2	France.....	83.95	94.22	68	Namibia.....	58.46	51.73
3	Denmark.....	81.60	90.30	69	Iran, Islamic Rep.....	58.16	51.23
4	Malta.....	80.90	89.13	70	Philippines.....	57.65	50.38
5	Sweden.....	80.51	88.48	71	Mongolia.....	57.51	50.14
6	United Kingdom.....	79.89	87.45	72	Chile.....	57.49	50.11
7	Luxembourg.....	79.12	86.16	72	Serbia.....	57.49	50.11
8	Austria.....	78.97	85.91	74	Saudi Arabia.....	57.47	50.08
9	Ireland.....	78.77	85.58	75	Ecuador.....	57.42	49.99
10	Finland.....	78.64	85.36	76	Algeria.....	57.18	49.59
11	Iceland.....	78.57	85.25	77	Cabo Verde.....	56.94	49.19
12	Spain.....	78.39	84.95	78	Mauritius.....	56.63	48.67
13	Germany.....	78.37	84.91	79	Bolivia, Plurinational St.....	55.98	47.59
14	Norway.....	77.49	83.45	80	Georgia.....	55.69	47.11
15	Belgium.....	77.38	83.26	81	Bahrain.....	55.15	46.21
16	Italy.....	76.96	82.56	82	Nicaragua.....	55.04	46.02
17	New Zealand.....	75.96	80.90	83	Kyrgyzstan.....	54.86	45.72
18	Netherlands.....	75.46	80.06	84	Nigeria.....	54.76	45.56
19	Israel.....	75.01	79.31	85	Kazakhstan.....	54.56	45.22
20	Japan.....	74.69	78.78	86	Paraguay.....	53.93	44.17
21	Australia.....	74.12	77.83	87	El Salvador.....	53.91	44.14
22	Greece.....	73.60	76.96	88	Turkey.....	52.96	42.56
23	Cyprus.....	72.60	75.30	89	Ukraine.....	52.87	42.41
24	Canada.....	72.18	74.60	90	Guatemala.....	52.33	41.51
25	Portugal.....	71.91	74.15	91	Moldova, Rep.....	51.97	40.91
26	United States of America.....	71.19	72.95	92	Botswana.....	51.70	40.46
27	Slovakia.....	70.60	71.96	93	Honduras.....	51.51	40.14
28	Lithuania.....	69.33	69.84	94	Oman.....	51.32	39.82
29	Bulgaria.....	67.85	67.38	95	Zambia.....	50.97	39.24
29	Costa Rica.....	67.85	67.38	96	Tanzania, United Rep.....	50.83	39.01
31	Qatar.....	67.80	67.29	97	China.....	50.74	38.86
32	Czech Republic.....	67.68	67.09	98	Thailand.....	49.88	37.42
33	Slovenia.....	67.57	66.91	99	Ghana.....	49.66	37.06
34	Trinidad and Tobago.....	67.36	66.56	100	Senegal.....	49.52	36.82
35	Latvia.....	66.12	64.49	101	Malawi.....	49.21	36.31
36	Albania.....	65.46	63.39	102	Tajikistan.....	47.85	34.04
37	Croatia.....	65.45	63.38	103	Kenya.....	47.25	33.04
38	Colombia.....	65.22	62.99	104	Bhutan.....	47.22	32.99
39	Hungary.....	65.01	62.64	105	Viet Nam.....	46.96	32.56
40	Romania.....	64.78	62.26	106	Indonesia.....	46.92	32.49
41	Dominican Republic.....	64.71	62.14	107	Mozambique.....	46.37	31.57
42	Uruguay.....	64.65	62.04	108	Côte d'Ivoire.....	45.25	29.70
43	Estonia.....	64.31	61.48	109	Ethiopia.....	44.78	28.92
44	Singapore.....	64.23	61.34	110	South Africa.....	44.73	28.84
45	Poland.....	64.11	61.14	111	Uganda.....	44.28	28.09
46	Venezuela, Bolivarian Rep.....	63.89	60.78	112	Mali.....	43.71	27.14
47	Russian Federation.....	63.79	60.61	113	Rwanda.....	43.68	27.09
48	Brunei Darussalam.....	63.57	60.24	114	Zimbabwe.....	43.41	26.64
49	Morocco.....	63.47	60.08	115	Cambodia.....	43.23	26.34
50	Panama.....	62.71	58.81	116	Lao PDR.....	42.94	25.85
51	Tunisia.....	62.35	58.21	117	Burkina Faso.....	42.83	25.67
52	Azerbaijan.....	62.33	58.18	118	Gambia.....	42.42	24.99
53	Korea, Rep.....	62.30	58.13	119	Bosnia and Herzegovina.....	41.84	24.02
54	Kuwait.....	62.28	58.09	120	Liberia.....	41.62	23.65
55	Jordan.....	62.20	57.96	121	Cameroon.....	40.81	22.30
56	Armenia.....	62.07	57.74	122	Eswatini.....	40.32	21.49
57	Peru.....	61.92	57.49	123	Pakistan.....	37.50	16.79
58	Montenegro.....	61.33	56.51	124	Angola.....	37.44	16.69
59	Egypt.....	61.21	56.31	125	Lesotho.....	33.78	10.59
60	North Macedonia.....	61.06	56.06	126	Madagascar.....	33.73	10.50
61	Brazil.....	60.70	55.46	127	Nepal.....	31.44	6.68
62	Sri Lanka.....	60.61	55.31	128	India.....	30.57	5.23
63	Mexico.....	59.69	53.78	129	Congo, Dem. Rep.....	30.41	4.97
64	Argentina.....	59.30	53.13	130	Bangladesh.....	29.56	3.55
65	Malaysia.....	59.22	52.99	131	Burundi.....	27.43	0.00
66	United Arab Emirates.....	58.90	52.46		Yemen.....	n/a	n/a

SOURCE: Wendling, Z. A., Emerson, J. W., Esty, D. C., Levy, M. A., de Sherbinin, A., et al. (2018). *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy. (<https://epi.envirocenter.yale.edu/>)

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4.2.2 Personal safety

Personal safety indicator | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Singapore.....	96.64	100.00	67	Bolivia, Plurinational St.....	68.63	53.20
2	Japan.....	96.32	99.47	68	Moldova, Rep.....	68.22	52.51
3	Iceland.....	96.13	99.15	69	United Arab Emirates.....	67.75	51.73
4	Australia.....	92.88	93.72	70	Burkina Faso.....	67.55	51.40
5	Korea, Rep.....	92.74	93.48	71	Liberia.....	67.34	51.04
6	New Zealand.....	92.37	92.87	72	Gambia.....	66.80	50.14
7	Canada.....	91.42	91.28	73	Tajikistan.....	66.32	49.34
8	Switzerland.....	90.09	89.06	74	Azerbaijan.....	66.20	49.14
9	Netherlands.....	90.08	89.04	74	Costa Rica.....	66.20	49.14
10	Norway.....	90.03	88.96	74	Tanzania, United Rep.....	66.20	49.14
11	Slovenia.....	89.14	87.47	77	Paraguay.....	66.17	49.09
12	Sweden.....	88.91	87.08	78	Montenegro.....	66.14	49.04
13	Portugal.....	88.80	86.90	79	Tunisia.....	65.88	48.60
14	Austria.....	88.71	86.75	80	Kazakhstan.....	65.80	48.47
15	Denmark.....	88.68	86.70	81	Argentina.....	65.50	47.97
16	Czech Republic.....	88.25	85.98	82	Uruguay.....	64.91	46.98
17	Germany.....	87.73	85.11	83	Algeria.....	64.81	46.82
17	Ireland.....	87.73	85.11	84	Peru.....	64.01	45.48
19	Finland.....	87.07	84.01	85	Zambia.....	63.70	44.96
20	Poland.....	86.66	83.32	86	Bangladesh.....	63.62	44.83
21	Bhutan.....	85.38	81.19	87	India.....	63.52	44.66
22	Slovakia.....	85.37	81.17	88	Madagascar.....	63.23	44.18
23	Spain.....	83.39	77.86	89	Namibia.....	63.11	43.98
24	Mauritius.....	83.38	77.84	90	Ecuador.....	62.03	42.17
25	Malta.....	82.67	76.66	91	China.....	62.02	42.16
26	Luxembourg.....	82.50	76.37	92	Bahrain.....	61.64	41.52
27	United Kingdom.....	82.14	75.77	93	Mali.....	60.81	40.13
28	Greece.....	81.16	74.14	94	Rwanda.....	60.80	40.12
29	France.....	80.75	73.45	95	Turkey.....	60.15	39.03
30	Cyprus.....	80.43	72.92	96	Ethiopia.....	59.13	37.33
31	Qatar.....	80.40	72.87	97	Kenya.....	58.92	36.98
32	Belgium.....	79.59	71.51	98	Ukraine.....	58.83	36.83
32	Hungary.....	79.59	71.51	99	Côte d'Ivoire.....	58.72	36.64
34	Bulgaria.....	79.17	70.81	100	Trinidad and Tobago.....	58.57	36.39
35	Israel.....	78.79	70.18	101	Iran, Islamic Rep.....	58.53	36.32
36	Romania.....	78.74	70.09	102	Thailand.....	57.95	35.36
37	Estonia.....	78.18	69.16	103	Jamaica.....	56.50	32.93
38	Kuwait.....	76.97	67.13	104	Saudi Arabia.....	56.00	32.10
39	Indonesia.....	76.84	66.92	105	Cambodia.....	55.83	31.81
40	Italy.....	76.31	66.03	106	Eswatini.....	55.80	31.76
41	Latvia.....	76.14	65.75	107	Mozambique.....	55.68	31.56
42	Viet Nam.....	75.43	64.56	108	Dominican Republic.....	55.43	31.14
43	Mongolia.....	75.40	64.51	109	Cameroon.....	55.24	30.83
44	Malaysia.....	75.05	63.93	110	Egypt.....	54.61	29.77
45	Croatia.....	74.85	63.59	111	Colombia.....	54.34	29.32
46	Lithuania.....	74.79	63.49	112	Mexico.....	53.68	28.22
47	Morocco.....	74.36	62.77	113	Uganda.....	53.55	28.00
48	Jordan.....	74.14	62.41	114	Russian Federation.....	53.33	27.64
49	Senegal.....	73.84	61.90	115	Nicaragua.....	53.24	27.49
50	Sri Lanka.....	73.28	60.97	116	Philippines.....	52.86	26.85
51	Malawi.....	73.24	60.90	117	Nigeria.....	52.62	26.45
52	Nepal.....	73.18	60.80	118	Lao PDR.....	52.52	26.28
53	Ghana.....	73.07	60.62	119	Brazil.....	52.48	26.22
54	Chile.....	73.02	60.53	120	South Africa.....	50.18	22.37
55	United States of America.....	72.91	60.35	121	Angola.....	49.60	21.40
56	Botswana.....	72.30	59.33	122	Guatemala.....	48.22	19.10
57	Albania.....	72.13	59.05	123	Pakistan.....	47.43	17.78
58	Bosnia and Herzegovina.....	71.90	58.66	124	Honduras.....	46.42	16.09
59	Serbia.....	71.58	58.13	125	Lesotho.....	44.71	13.23
60	Cabo Verde.....	71.57	58.11	126	Burundi.....	42.66	9.81
61	North Macedonia.....	71.38	57.79	127	Zimbabwe.....	40.51	6.22
62	Armenia.....	71.34	57.73	128	El Salvador.....	40.43	6.08
63	Panama.....	70.28	55.96	129	Congo, Dem. Rep.....	37.46	1.12
64	Oman.....	70.26	55.92	130	Venezuela, Bolivarian Rep.....	36.98	0.32
65	Georgia.....	70.05	55.57	131	Yemen.....	36.79	0.00
66	Kyrgyzstan.....	69.08	53.95		Brunei Darussalam.....	n/a	n/a

SOURCE: Social Progress Imperative, The Social Progress Index 2019 (<https://www.socialprogress.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

4.2.3 Physician density

Physicians (per 1,000 people) | 2016

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Greece	6.25	100.00	67	Brunei Darussalam	1.75	27.69
2	Austria	5.23	83.56	68	Tajikistan	1.71	27.18
3	Georgia	4.78	76.28	69	Ecuador	1.66	26.40
4	Portugal	4.43	70.67	70	El Salvador	1.60	25.29
5	Norway	4.38	70.01	71	Panama	1.59	25.26
6	Lithuania	4.38	69.92	72	United Arab Emirates	1.56	24.68
7	Switzerland	4.25	67.82	73	Malaysia	1.53	24.28
8	Germany	4.19	66.90	74	Dominican Republic	1.49	23.65
9	Sweden	4.19	66.85	75	Iran, Islamic Rep.	1.49	23.60
10	Italy	4.02	64.18	76	Tunisia	1.29	20.37
11	Bulgaria	4.00	63.82	77	Albania	1.29	20.32
12	Russian Federation	3.98	63.44	77	Paraguay	1.29	20.32
13	Malta	3.91	62.36	79	Algeria	1.21	19.05
14	Argentina	3.91	62.35	80	Costa Rica	1.15	18.14
15	Spain	3.87	61.79	81	Peru	1.12	17.59
16	Iceland	3.79	60.49	82	Chile	1.03	16.26
17	Uruguay	3.74	59.61	83	Pakistan	0.98	15.38
18	Czech Republic	3.68	58.66	84	Bahrain	0.92	14.48
19	Denmark	3.65	58.31	85	Nicaragua	0.91	14.35
20	Israel	3.58	57.04	86	Guatemala	0.90	14.08
21	Australia	3.50	55.76	87	Sri Lanka	0.88	13.82
22	Netherlands	3.48	55.47	88	Viet Nam	0.82	12.86
23	Slovakia	3.45	55.02	89	South Africa	0.82	12.81
24	Estonia	3.43	54.70	90	Egypt	0.81	12.75
25	Jordan	3.43	54.63	91	Cabo Verde	0.79	12.33
26	Azerbaijan	3.40	54.25	92	India	0.76	11.85
27	Kazakhstan	3.27	52.20	93	Morocco	0.62	9.61
28	Mongolia	3.26	52.00	94	Nepal	0.60	9.28
29	France	3.24	51.62	95	Lao PDR	0.49	7.57
30	Latvia	3.21	51.15	96	Bolivia, Plurinational St.	0.47	7.28
31	Moldova, Rep.	3.20	50.98	97	Bangladesh	0.47	7.26
32	Finland	3.20	50.95	97	Jamaica	0.47	7.26
33	Croatia	3.13	49.82	99	Thailand	0.47	7.23
34	Hungary	3.09	49.29	100	Nigeria	0.40	6.03
35	New Zealand	3.06	48.78	101	Botswana	0.38	5.85
36	Belgium	3.01	47.98	102	Bhutan	0.38	5.81
37	Ukraine	3.00	47.80	103	Namibia	0.37	5.69
38	Ireland	2.96	47.18	104	Yemen	0.31	4.68
39	Luxembourg	2.92	46.54	105	Kenya	0.20	2.97
40	North Macedonia	2.88	45.80	106	Indonesia	0.20	2.92
41	United Kingdom	2.83	45.00	107	Eswatini	0.15	2.05
42	Slovenia	2.82	44.92	108	Angola	0.14	2.00
43	Armenia	2.80	44.64	108	Côte d'Ivoire	0.14	2.00
44	Romania	2.67	42.50	110	Cambodia	0.14	1.99
45	Kuwait	2.61	41.52	110	Madagascar	0.14	1.99
46	Saudi Arabia	2.57	40.88	112	Gambia	0.11	1.41
46	United States of America	2.57	40.88	113	Ghana	0.10	1.23
48	Canada	2.54	40.41	114	Uganda	0.09	1.19
49	Cyprus	2.50	39.72	115	Congo, Dem. Rep.	0.09	1.15
50	Serbia	2.46	39.19	115	Zambia	0.09	1.15
51	Japan	2.37	37.65	117	Mali	0.08	1.06
52	Montenegro	2.34	37.27	118	Cameroon	0.08	1.03
53	Korea, Rep.	2.33	36.99	119	Zimbabwe	0.08	0.93
54	Poland	2.29	36.42	120	Senegal	0.07	0.79
55	Singapore	2.28	36.19	121	Rwanda	0.06	0.72
56	Mexico	2.23	35.47	122	Mozambique	0.06	0.58
57	Mauritius	2.00	31.82	123	Burkina Faso	0.05	0.45
58	Qatar	1.96	31.19	124	Liberia	0.02	0.06
59	Oman	1.92	30.40	125	Ethiopia	0.02	0.05
60	Bosnia and Herzegovina	1.89	29.94	125	Tanzania, United Rep.	0.02	0.05
61	Kyrgyzstan	1.85	29.43	127	Malawi	0.02	0.00
62	Brazil	1.85	29.39		Burundi	n/a	n/a
63	Colombia	1.82	28.90		Honduras	n/a	n/a
63	Trinidad and Tobago	1.82	28.90		Lesotho	n/a	n/a
65	China	1.81	28.75		Philippines	n/a	n/a
66	Turkey	1.75	27.74		Venezuela, Bolivarian Rep.	n/a	n/a

SOURCE: World Bank, World Development Indicators based on World Health Organization, Global Atlas of the Health Workforce; OECD; and country data (<http://data.worldbank.org/data-catalog/world-development-indicators>)

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4.2.4 Sanitation

Population with access to improved sanitation facilities (%) | 2015

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Australia	100.00	100.00	67	Armenia	91.58	90.94
1	Bahrain	100.00	100.00	68	Paraguay	91.22	90.55
1	Israel	100.00	100.00	69	El Salvador	91.13	90.45
1	Japan	100.00	100.00	70	North Macedonia	90.91	90.22
1	Kuwait	100.00	100.00	71	Azerbaijan	89.35	88.54
1	New Zealand	100.00	100.00	72	Mexico	89.22	88.40
1	Qatar	100.00	100.00	73	Russian Federation	88.79	87.93
1	Saudi Arabia	100.00	100.00	74	Iran, Islamic Rep.	88.29	87.40
1	Singapore	100.00	100.00	75	Algeria	87.49	86.53
10	United Arab Emirates	99.98	99.98	76	Brazil	86.15	85.09
11	Austria	99.97	99.97	77	Ecuador	86.14	85.08
12	United States of America	99.97	99.97	78	Bulgaria	85.98	84.91
13	Malta	99.96	99.96	79	Jamaica	85.37	84.26
14	Spain	99.90	99.90	80	Georgia	84.88	83.72
15	Switzerland	99.89	99.88	81	Colombia	84.44	83.25
16	Chile	99.89	99.88	82	Morocco	83.47	82.21
17	Korea, Rep.	99.89	99.88	83	Dominican Republic	82.70	81.38
18	Estonia	99.61	99.58	84	Romania	81.81	80.43
19	Denmark	99.60	99.57	85	Honduras	79.78	78.24
20	Malaysia	99.57	99.54	86	Moldova, Rep.	78.40	76.75
21	Belgium	99.49	99.45	87	Viet Nam	78.24	76.58
22	Finland	99.45	99.41	88	Panama	76.87	75.10
23	Portugal	99.44	99.40	89	Peru	76.82	75.05
24	Cyprus	99.37	99.32	90	Nicaragua	76.35	74.55
25	Oman	99.32	99.27	91	China	75.04	73.14
26	Sweden	99.30	99.25	92	Philippines	74.98	73.07
27	Italy	99.28	99.23	93	South Africa	73.13	71.08
28	Germany	99.22	99.16	94	Lao PDR	72.59	70.51
29	Czech Republic	99.14	99.07	95	Indonesia	67.89	65.44
30	United Kingdom	99.11	99.05	96	Guatemala	67.36	64.88
31	Slovenia	99.11	99.04	97	Cabo Verde	65.21	62.56
32	Greece	98.96	98.89	98	Bhutan	62.87	60.04
33	Slovakia	98.93	98.85	99	Rwanda	62.35	59.48
34	Iceland	98.78	98.68	100	Botswana	59.96	56.91
35	France	98.65	98.55	101	Yemen	59.68	56.61
36	Canada	98.50	98.39	102	Mongolia	59.22	56.11
37	Poland	98.13	97.99	103	Pakistan	58.25	55.07
38	Norway	98.06	97.91	104	Eswatini	58.03	54.83
39	Hungary	97.99	97.84	105	Bolivia, Plurinational St.	52.61	49.00
40	Kazakhstan	97.81	97.64	106	Burundi	50.46	46.69
41	Netherlands	97.73	97.55	107	Cambodia	48.83	44.93
42	Albania	97.69	97.51	108	Senegal	48.36	44.42
43	Luxembourg	97.61	97.43	109	Bangladesh	46.92	42.88
44	Croatia	97.47	97.27	110	Nepal	46.13	42.02
45	Costa Rica	97.15	96.93	111	India	44.15	39.90
46	Jordan	96.71	96.46	112	Lesotho	43.79	39.51
47	Kyrgyzstan	96.59	96.33	113	Malawi	43.53	39.23
48	Turkey	96.37	96.10	114	Gambia	41.69	37.25
49	Brunei Darussalam	96.33	96.05	115	Angola	39.43	34.82
50	Ukraine	95.94	95.63	116	Cameroon	38.83	34.18
51	Montenegro	95.91	95.60	117	Zimbabwe	38.59	33.91
52	Uruguay	95.67	95.35	118	Namibia	33.84	28.80
53	Tajikistan	95.49	95.15	119	Nigeria	32.60	27.47
54	Thailand	95.01	94.63	120	Mali	31.27	26.03
55	Venezuela, Bolivarian Rep.	94.93	94.55	121	Zambia	31.11	25.86
56	Argentina	94.84	94.45	122	Côte d'Ivoire	29.93	24.59
57	Bosnia and Herzegovina	94.78	94.38	123	Kenya	29.84	24.50
58	Serbia	94.64	94.23	124	Mozambique	23.56	17.74
59	Sri Lanka	94.21	93.77	125	Tanzania, United Rep.	23.53	17.71
60	Lithuania	93.62	93.14	126	Burkina Faso	22.53	16.63
61	Egypt	93.17	92.65	127	Congo, Dem. Rep.	19.71	13.60
62	Mauritius	93.15	92.63	128	Uganda	19.15	12.99
63	Tunisia	93.13	92.60	129	Liberia	16.89	10.56
64	Latvia	92.86	92.32	130	Ghana	14.28	7.75
65	Ireland	92.18	91.58	131	Madagascar	9.69	2.81
66	Trinidad and Tobago	92.15	91.55	132	Ethiopia	7.08	0.00

SOURCE: World Bank, World Development Indicators based on WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation (<http://data.worldbank.org/data-catalog/world-development-indicators>)

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Pillar 5

Vocational and Technical Skills

5.1.1 Workforce with secondary education

Labour force with secondary education (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Kyrgyzstan	73.91	100.00	67	Saudi Arabia	33.41	44.53
2	Bosnia and Herzegovina	72.10	97.52	68	South Africa	32.83	43.73
3	Czech Republic	70.52	95.36	69	Luxembourg	32.74	43.62
4	Slovakia	68.90	93.14	70	Malta	32.72	43.59
5	Azerbaijan	66.22	89.47	71	Dominican Republic	32.38	43.12
6	Armenia	66.10	89.31	72	Sri Lanka	32.30	43.01
7	Tajikistan	64.40	86.98	73	Ecuador	31.60	42.05
8	Montenegro	62.51	84.39	74	Colombia	30.70	40.83
9	Croatia	62.41	84.25	75	Indonesia	29.67	39.41
10	Hungary	61.45	82.94	76	Paraguay	29.17	38.72
11	Romania	60.59	81.76	77	Singapore	27.80	36.85
12	Poland	60.08	81.06	78	Portugal	27.68	36.68
13	Georgia	58.55	78.97	79	Uganda	27.54	36.49
14	Brunei Darussalam	58.32	78.65	80	Zambia	27.35	36.24
15	Germany	57.61	77.68	81	Lesotho	26.67	35.30
16	Serbia	57.55	77.60	82	Qatar	25.80	34.10
17	Namibia	57.07	76.94	83	Canada	25.31	33.44
18	Bulgaria	56.74	76.49	84	Bolivia, Plurinational St.	24.77	32.70
19	North Macedonia	56.31	75.90	85	Spain	24.02	31.67
20	Slovenia	55.99	75.46	86	Nigeria	23.93	31.55
21	Latvia	55.81	75.22	87	Mexico	23.61	31.10
22	Israel	55.58	74.90	88	Yemen	22.96	30.21
23	Peru	53.30	71.78	89	Thailand	21.86	28.71
24	Chile	52.29	70.39	90	Nicaragua	21.48	28.19
25	Lithuania	52.27	70.36	91	Turkey	21.13	27.72
26	Austria	52.16	70.22	92	Ghana	21.02	27.56
27	Japan	51.06	68.71	93	Morocco	20.75	27.19
28	New Zealand	51.01	68.64	94	Kuwait	20.72	27.15
29	Trinidad and Tobago	49.89	67.11	95	Bangladesh	20.66	27.07
30	Estonia	48.76	65.56	96	Honduras	20.55	26.92
31	United States of America	48.67	65.43	97	Lao PDR	20.36	26.67
32	Mongolia	48.42	65.09	98	Côte d'Ivoire	20.27	26.53
33	Cabo Verde	46.22	62.08	99	Viet Nam	20.25	26.51
34	Italy	46.10	61.91	100	Pakistan	19.76	25.84
35	Finland	45.87	61.60	101	Costa Rica	19.64	25.67
36	Switzerland	44.98	60.38	102	Liberia	18.41	23.99
37	Ukraine	44.81	60.15	103	Botswana	17.48	22.72
38	Russian Federation	44.71	60.00	104	United Arab Emirates	16.42	21.27
39	Malaysia	43.75	58.69	105	Bhutan	15.95	20.61
40	France	43.71	58.64	106	Cameroon	14.84	19.10
41	Sweden	43.70	58.62	107	Malawi	14.67	18.87
42	Mauritius	43.62	58.52	108	Madagascar	14.50	18.63
43	Argentina	43.18	57.91	109	Guatemala	14.27	18.32
44	Greece	43.09	57.78	110	Venezuela, Bolivarian Rep.	12.87	16.40
45	Brazil	42.97	57.62	111	Gambia	12.28	15.60
46	Denmark	41.80	56.02	112	Uruguay	11.00	13.84
47	Netherlands	41.13	55.10	113	Rwanda	10.09	12.60
48	United Kingdom	40.27	53.93	114	Bahrain	9.59	11.91
49	Norway	40.22	53.86	115	India	8.53	10.46
50	Australia	40.06	53.64	116	Angola	7.75	9.38
51	Kazakhstan	39.97	53.51	117	Cambodia	7.56	9.13
52	Egypt	39.36	52.69	118	Senegal	6.19	7.25
53	Cyprus	39.19	52.44	119	Ethiopia	6.09	7.11
54	Korea, Rep.	39.03	52.23	120	Mozambique	5.87	6.81
55	Tunisia	38.99	52.17	121	Philippines	5.11	5.77
56	Belgium	38.87	52.02	122	Tanzania, United Rep.	3.97	4.21
57	Panama	38.24	51.14	123	Mali	3.37	3.39
58	Congo, Dem. Rep.	38.03	50.86	124	Burundi	2.39	2.05
59	Ireland	37.59	50.26	125	Burkina Faso	2.28	1.90
60	Kenya	37.16	49.67	126	Zimbabwe	2.01	1.53
61	Algeria	36.51	48.78	127	Eswatini	0.90	0.00
62	Albania	36.31	48.51		China	n/a	n/a
63	Moldova, Rep.	35.85	47.88		Iran, Islamic Rep.	n/a	n/a
64	Iceland	35.20	46.99		Jamaica	n/a	n/a
65	Nepal	33.62	44.82		Jordan	n/a	n/a
66	El Salvador	33.51	44.67		Oman	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

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5.1.2 Population with secondary education

Population with secondary education (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Kyrgyzstan	70.75	100.00	67	Iran, Islamic Rep.	25.32	34.91
2	Czech Republic	69.98	98.90	68	Jordan	25.17	34.70
3	Slovakia	67.48	95.31	69	Indonesia	24.33	33.50
4	Azerbaijan	63.20	89.18	70	Paraguay	22.57	30.98
5	Georgia	60.59	85.45	71	Dominican Republic	22.49	30.85
6	Poland	59.83	84.35	72	Qatar	22.13	30.34
7	Tajikistan	57.89	81.58	73	Russian Federation	21.93	30.05
8	Latvia	57.34	80.79	74	El Salvador	21.67	29.67
9	Germany	56.71	79.89	75	Kenya	21.64	29.64
10	South Africa	55.73	78.48	76	Panama	21.52	29.47
11	Sri Lanka	55.62	78.32	77	Malta	21.29	29.13
12	Slovenia	54.92	77.32	78	Bangladesh	20.45	27.93
13	Hungary	54.66	76.95	79	Pakistan	18.99	25.84
14	Montenegro	52.86	74.37	80	Viet Nam	18.98	25.83
15	Croatia	52.32	73.59	81	Spain	18.86	25.65
16	Lithuania	52.15	73.35	82	Bolivia, Plurinational St.	18.62	25.30
17	Romania	51.82	72.87	83	Kuwait	18.50	25.14
18	Austria	51.76	72.80	84	United Arab Emirates	18.21	24.72
19	Bosnia and Herzegovina	51.29	72.12	85	Congo, Dem. Rep.	18.15	24.63
20	Bulgaria	50.97	71.66	86	Mexico	18.13	24.60
21	Serbia	50.72	71.30	87	Guatemala	18.07	24.52
22	Brunei Darussalam	49.83	70.03	88	Portugal	17.77	24.09
23	Estonia	49.09	68.97	89	Turkey	17.59	23.84
24	Switzerland	47.72	67.01	90	Ghana	17.43	23.61
25	Trinidad and Tobago	46.87	65.79	91	Algeria	17.26	23.35
26	Japan	45.94	64.46	92	India	16.95	22.92
27	United States of America	45.58	63.94	93	Uruguay	16.85	22.78
28	Jamaica	44.67	62.64	94	Costa Rica	16.80	22.70
29	Armenia	44.51	62.41	95	Cameroon	16.72	22.59
30	Mongolia	43.86	61.47	96	Cambodia	15.63	21.02
31	Sweden	42.54	59.58	97	Honduras	13.82	18.43
32	Moldova, Rep.	41.65	58.31	98	Thailand	13.54	18.03
33	Denmark	41.31	57.83	99	China	13.50	17.98
34	France	40.07	56.04	100	Angola	13.23	17.59
35	Finland	39.67	55.47	101	Nepal	12.12	15.99
36	Malaysia	39.49	55.22	102	Lesotho	11.92	15.71
37	Norway	39.05	54.58	103	Cabo Verde	10.26	13.33
38	Netherlands	37.87	52.89	104	Ethiopia	7.74	9.72
39	Mauritius	37.83	52.84	105	Mozambique	7.64	9.58
40	Chile	37.13	51.83	106	Senegal	6.83	8.42
41	New Zealand	36.55	51.00	107	Côte d'Ivoire	5.87	7.04
42	Luxembourg	36.44	50.84	108	Rwanda	4.94	5.71
43	Korea, Rep.	36.15	50.42	109	Mali	3.58	3.76
44	United Kingdom	35.73	49.82	110	Burkina Faso	2.81	2.65
45	Argentina	35.30	49.21	111	Zimbabwe	2.14	1.69
46	Peru	35.11	48.93	112	Burundi	1.97	1.46
47	Canada	35.07	48.89	113	Uganda	1.70	1.06
48	Italy	34.80	48.49	114	Tanzania, United Rep.	1.47	0.73
49	Cyprus	34.67	48.30	115	Bhutan	0.96	0.00
50	Belgium	34.54	48.12		Botswana	n/a	n/a
51	Israel	34.34	47.83		Egypt	n/a	n/a
52	Australia	34.12	47.52		Eswatini	n/a	n/a
53	Greece	33.44	46.54		Gambia	n/a	n/a
54	Kazakhstan	32.75	45.56		Iceland	n/a	n/a
55	Albania	32.38	45.02		Lao PDR	n/a	n/a
56	Ireland	32.00	44.49		Liberia	n/a	n/a
57	Philippines	31.87	44.30		Madagascar	n/a	n/a
58	Brazil	30.19	41.89		Malawi	n/a	n/a
59	Bahrain	29.61	41.05		Morocco	n/a	n/a
60	Tunisia	29.43	40.80		Namibia	n/a	n/a
61	Oman	29.08	40.30		Nicaragua	n/a	n/a
62	Ecuador	28.82	39.92		Nigeria	n/a	n/a
63	Saudi Arabia	27.91	38.62		North Macedonia	n/a	n/a
64	Venezuela, Bolivarian Rep.	27.60	38.18		Ukraine	n/a	n/a
65	Colombia	27.11	37.48		Yemen	n/a	n/a
66	Singapore	26.84	37.09		Zambia	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

5.1.3 Technicians and associate professionals

Technicians and associate professionals (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Japan.....	22.82	100.00	67	Kuwait.....	7.49	32.13
2	Germany.....	22.57	98.91	68	Georgia.....	7.44	31.93
3	Nigeria.....	21.09	92.32	69	Oman.....	7.43	31.87
4	Singapore.....	20.73	90.75	70	Uruguay.....	7.43	31.85
5	France.....	19.91	87.12	71	Egypt.....	7.23	30.97
6	Finland.....	19.22	84.06	72	Mexico.....	7.11	30.46
7	Switzerland.....	19.05	83.33	73	Qatar.....	6.81	29.12
8	Sweden.....	18.55	81.09	74	Sri Lanka.....	6.76	28.90
9	Luxembourg.....	17.67	77.19	75	Nicaragua.....	6.64	28.39
10	Italy.....	17.61	76.96	76	Bahrain.....	6.20	26.42
11	Denmark.....	17.45	76.22	77	Dominican Republic.....	6.07	25.84
12	Czech Republic.....	17.28	75.49	78	Indonesia.....	6.04	25.70
13	Austria.....	17.25	75.32	79	Romania.....	6.04	25.69
14	Canada.....	16.84	73.53	80	Moldova, Rep.....	6.00	25.53
15	Korea, Rep.....	16.83	73.48	81	Turkey.....	5.97	25.42
16	Norway.....	16.10	70.26	82	Honduras.....	5.85	24.88
17	Netherlands.....	15.98	69.74	83	Tajikistan.....	5.77	24.53
18	Slovakia.....	15.68	68.37	84	Iran, Islamic Rep.....	5.66	24.03
19	Malta.....	15.11	65.86	85	Jamaica.....	5.61	23.81
20	Hungary.....	14.64	63.78	86	Congo, Dem. Rep.....	5.56	23.61
21	Croatia.....	14.39	62.68	87	Namibia.....	5.46	23.13
22	Belgium.....	14.25	62.05	88	Cabo Verde.....	5.20	21.99
23	United States of America.....	14.21	61.88	89	Albania.....	4.94	20.84
24	Iceland.....	13.93	60.65	90	Ecuador.....	4.78	20.11
25	Brunei Darussalam.....	13.86	60.32	91	Bolivia, Plurinational St.....	4.76	20.06
26	Estonia.....	13.71	59.68	92	Algeria.....	4.76	20.05
27	Latvia.....	13.71	59.66	93	Thailand.....	4.58	19.23
28	Poland.....	13.36	58.11	94	Nepal.....	4.44	18.63
29	Trinidad and Tobago.....	13.30	57.87	95	Morocco.....	4.40	18.45
30	Slovenia.....	13.07	56.82	96	Côte d'Ivoire.....	4.33	18.14
31	Russian Federation.....	12.95	56.29	97	El Salvador.....	4.22	17.64
32	Israel.....	12.86	55.91	98	Lesotho.....	4.20	17.57
33	Cyprus.....	12.79	55.60	99	Eswatini.....	4.06	16.96
34	Australia.....	12.74	55.37	100	Philippines.....	4.04	16.86
35	United Kingdom.....	12.61	54.81	101	Pakistan.....	3.97	16.55
36	Peru.....	12.53	54.45	102	Angola.....	3.63	15.04
37	New Zealand.....	12.44	54.05	103	Zambia.....	3.58	14.83
38	Montenegro.....	12.23	53.14	104	Bhutan.....	3.55	14.69
39	Saudi Arabia.....	12.19	52.94	105	Yemen.....	3.47	14.34
40	Kazakhstan.....	12.00	52.10	106	India.....	3.32	13.67
41	Serbia.....	11.66	50.60	107	Viet Nam.....	3.27	13.44
42	Chile.....	11.59	50.30	108	Uganda.....	2.89	11.77
43	Ireland.....	11.38	49.37	109	Cameroon.....	2.89	11.76
44	Portugal.....	11.36	49.29	110	Guatemala.....	2.64	10.67
45	Spain.....	11.24	48.72	111	Lao PDR.....	2.63	10.60
46	Ukraine.....	11.20	48.56	112	Mongolia.....	2.62	10.55
47	Mauritius.....	10.56	45.73	113	Ghana.....	2.55	10.24
48	Malaysia.....	10.26	44.40	114	Tanzania, United Rep.....	2.08	8.17
49	United Arab Emirates.....	10.21	44.19	115	Bangladesh.....	1.86	7.21
50	North Macedonia.....	9.87	42.65	116	Burundi.....	1.62	6.15
51	Costa Rica.....	9.79	42.30	117	Zimbabwe.....	1.60	6.06
52	Lithuania.....	9.59	41.41	118	Gambia.....	1.50	5.59
53	Bulgaria.....	9.42	40.67	119	Senegal.....	1.49	5.56
54	Azerbaijan.....	9.35	40.37	120	Rwanda.....	1.47	5.48
55	Bosnia and Herzegovina.....	9.23	39.83	121	Mozambique.....	1.47	5.47
56	Argentina.....	9.10	39.26	122	Ethiopia.....	1.30	4.71
57	Armenia.....	8.80	37.95	123	Mali.....	1.17	4.15
58	Colombia.....	8.80	37.93	124	Liberia.....	1.16	4.11
59	South Africa.....	8.76	37.77	125	Cambodia.....	0.97	3.28
60	Greece.....	7.94	34.12	126	Madagascar.....	0.86	2.77
61	Kyrgyzstan.....	7.84	33.68	127	Malawi.....	0.23	0.00
62	Botswana.....	7.80	33.51		Burkina Faso.....	n/a	n/a
63	Panama.....	7.73	33.22		China.....	n/a	n/a
64	Brazil.....	7.63	32.73		Jordan.....	n/a	n/a
65	Tunisia.....	7.57	32.49		Kenya.....	n/a	n/a
66	Paraguay.....	7.54	32.37		Venezuela, Bolivarian Rep.....	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

5.1.4 Labour productivity per employee

Labour productivity per person employed (2018 US\$) | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Qatar.....	170,528.53	100.00	67	Sri Lanka.....	36,367.74	20.16
2	Singapore.....	153,123.97	89.64	68	China.....	35,604.34	19.71
3	Ireland.....	152,145.65	89.06	69	Thailand.....	35,555.98	19.68
4	Luxembourg.....	141,060.35	82.46	70	Serbia.....	34,855.53	19.26
5	Norway.....	139,960.22	81.81	71	Albania.....	34,572.13	19.10
6	Saudi Arabia.....	138,682.72	81.05	72	Colombia.....	33,219.50	18.29
7	United States of America.....	131,783.05	76.94	73	Brazil.....	32,863.97	18.08
8	Kuwait.....	129,337.48	75.49	74	Armenia.....	30,870.17	16.89
9	Belgium.....	114,405.43	66.60	75	Indonesia.....	28,693.57	15.60
10	United Arab Emirates.....	110,221.02	64.11	76	Peru.....	27,341.47	14.79
11	Switzerland.....	107,122.39	62.27	77	Morocco.....	25,966.48	13.98
12	Sweden.....	106,004.00	61.60	78	Georgia.....	25,463.05	13.68
13	France.....	105,106.10	61.07	79	Ecuador.....	24,821.52	13.29
14	Netherlands.....	103,412.12	60.06	80	Ukraine.....	24,715.03	13.23
15	Australia.....	103,329.57	60.01	81	Philippines.....	23,770.19	12.67
16	Austria.....	102,332.33	59.42	82	Venezuela, Bolivarian Rep.....	21,578.56	11.36
17	Denmark.....	101,064.91	58.66	83	Moldova, Rep.....	21,534.95	11.34
18	Finland.....	98,109.62	56.91	84	Guatemala.....	21,138.96	11.10
19	Iceland.....	97,625.32	56.62	85	India.....	20,127.21	10.50
20	Germany.....	96,409.84	55.89	86	Jamaica.....	19,840.06	10.33
21	Canada.....	95,612.57	55.42	87	Pakistan.....	18,959.46	9.81
22	Bahrain.....	93,765.60	54.32	88	Bolivia, Plurinational St.....	16,858.99	8.56
23	Italy.....	93,519.23	54.17	89	Nigeria.....	16,669.75	8.44
24	Spain.....	93,007.75	53.87	90	Angola.....	16,126.22	8.12
25	United Kingdom.....	92,771.96	53.73	91	Senegal.....	14,292.63	7.03
26	Malta.....	90,602.37	52.44	92	Zambia.....	14,196.57	6.97
27	Japan.....	82,381.88	47.55	93	Viet Nam.....	13,768.41	6.72
28	Cyprus.....	82,067.56	47.36	94	Côte d'Ivoire.....	13,686.90	6.67
29	Korea, Rep.....	80,565.77	46.47	95	Ghana.....	13,046.65	6.29
30	Slovakia.....	80,505.01	46.43	96	Tajikistan.....	12,938.10	6.22
31	Israel.....	80,279.21	46.30	97	Yemen.....	12,253.26	5.81
32	Turkey.....	77,482.75	44.63	98	Bangladesh.....	11,713.22	5.49
33	Poland.....	75,650.98	43.54	99	Kyrgyzstan.....	10,388.66	4.71
34	New Zealand.....	75,614.33	43.52	100	Kenya.....	8,600.60	3.64
35	Oman.....	74,898.35	43.09	101	Cambodia.....	7,447.75	2.96
36	Slovenia.....	74,253.40	42.71	102	Uganda.....	7,179.00	2.80
37	Czech Republic.....	73,846.87	42.47	103	Tanzania, United Rep.....	6,990.08	2.68
38	Greece.....	73,257.24	42.12	104	Mali.....	6,901.62	2.63
39	Lithuania.....	72,339.72	41.57	105	Cameroon.....	6,569.18	2.43
40	Estonia.....	70,040.30	40.20	106	Zimbabwe.....	4,881.15	1.43
41	Hungary.....	68,737.93	39.43	107	Burkina Faso.....	4,585.16	1.25
42	Malaysia.....	68,472.93	39.27	108	Mozambique.....	3,821.48	0.80
43	Trinidad and Tobago.....	68,391.42	39.22	109	Ethiopia.....	3,537.87	0.63
44	Portugal.....	66,396.16	38.03	110	Madagascar.....	3,260.35	0.46
45	Iran, Islamic Rep.....	65,299.26	37.38	111	Congo, Dem. Rep.....	2,646.64	0.10
46	Latvia.....	65,278.51	37.37	112	Malawi.....	2,481.62	0.00
47	Croatia.....	63,880.02	36.54		Bhutan.....	n/a	n/a
48	Romania.....	61,281.79	34.99		Botswana.....	n/a	n/a
49	Algeria.....	61,121.84	34.90		Brunei Darussalam.....	n/a	n/a
50	Kazakhstan.....	59,881.77	34.16		Burundi.....	n/a	n/a
51	Russian Federation.....	59,174.22	33.74		Cabo Verde.....	n/a	n/a
52	Chile.....	58,351.19	33.25		El Salvador.....	n/a	n/a
53	Bosnia and Herzegovina.....	57,926.77	32.99		Eswatini.....	n/a	n/a
54	Montenegro.....	55,678.31	31.66		Gambia.....	n/a	n/a
55	Uruguay.....	50,197.19	28.39		Honduras.....	n/a	n/a
56	Egypt.....	49,092.80	27.74		Lao PDR.....	n/a	n/a
57	Mexico.....	47,129.48	26.57		Lesotho.....	n/a	n/a
58	South Africa.....	47,053.36	26.52		Liberia.....	n/a	n/a
59	Bulgaria.....	46,987.10	26.48		Mauritius.....	n/a	n/a
60	Argentina.....	44,186.86	24.82		Mongolia.....	n/a	n/a
61	Jordan.....	43,210.95	24.24		Namibia.....	n/a	n/a
62	Costa Rica.....	42,003.46	23.52		Nepal.....	n/a	n/a
63	Tunisia.....	41,985.53	23.51		Nicaragua.....	n/a	n/a
64	Dominican Republic.....	40,704.34	22.75		Panama.....	n/a	n/a
65	North Macedonia.....	40,062.58	22.36		Paraguay.....	n/a	n/a
66	Azerbaijan.....	37,317.34	20.73		Rwanda.....	n/a	n/a

SOURCE: The Conference Board, Total Economy Database™ (Adjusted version) (www.conference-board.org/data/economydatabase)

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5.2.1 Ease of finding skilled employees

Average answer to the question: In your country, to what extent can companies find people with the skills required to fill their vacancies? [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	5.75	100.00	67	Cabo Verde.....	4.09	54.68
2	Israel.....	5.47	92.36	68	Mali.....	4.03	53.15
3	Finland.....	5.34	88.79	69	Honduras.....	4.03	53.10
4	Malaysia.....	5.28	87.27	70	Albania.....	4.03	53.07
5	Norway.....	5.24	85.95	71	Madagascar.....	4.03	53.00
6	Switzerland.....	5.21	85.17	72	Ecuador.....	4.03	52.95
7	Germany.....	5.20	85.09	73	Tanzania, United Rep.	4.02	52.84
8	United Kingdom.....	5.15	83.63	74	South Africa.....	4.02	52.80
9	United Arab Emirates.....	5.10	82.28	75	Iran, Islamic Rep.....	4.01	52.66
10	Singapore.....	5.10	82.18	76	Dominican Republic.....	4.01	52.47
11	Qatar.....	5.06	81.03	77	Mauritius.....	3.97	51.55
12	Ireland.....	5.04	80.65	78	Uruguay.....	3.97	51.39
13	Netherlands.....	5.00	79.41	79	Kuwait.....	3.96	51.25
14	Canada.....	4.99	79.15	80	Eswatini.....	3.96	51.21
15	Iceland.....	4.97	78.83	81	Montenegro.....	3.96	51.06
16	Sweden.....	4.97	78.71	82	Tajikistan.....	3.94	50.53
17	Costa Rica.....	4.94	77.84	83	Kazakhstan.....	3.90	49.46
18	Philippines.....	4.89	76.50	84	Thailand.....	3.90	49.42
19	Kenya.....	4.88	76.37	85	Armenia.....	3.87	48.67
20	Denmark.....	4.86	75.58	86	Malawi.....	3.86	48.55
21	Chile.....	4.83	74.92	87	Botswana.....	3.85	48.21
22	Australia.....	4.81	74.38	88	Congo, Dem. Rep.....	3.85	48.13
23	Korea, Rep.....	4.80	74.02	89	Algeria.....	3.84	47.97
24	France.....	4.80	73.97	90	Nepal.....	3.84	47.87
25	Cyprus.....	4.78	73.49	91	Lao PDR.....	3.82	47.46
26	Belgium.....	4.73	72.02	92	Latvia.....	3.82	47.28
27	Azerbaijan.....	4.72	71.87	93	Nigeria.....	3.80	46.93
28	Portugal.....	4.70	71.36	94	Bhutan.....	3.80	46.89
29	Bahrain.....	4.69	71.19	95	Morocco.....	3.77	45.97
30	India.....	4.68	70.91	96	Malta.....	3.72	44.60
31	Indonesia.....	4.67	70.47	97	Liberia.....	3.71	44.40
32	Austria.....	4.65	70.04	98	Ethiopia.....	3.69	43.80
33	Zambia.....	4.65	69.97	99	Viet Nam.....	3.68	43.47
34	Côte d'Ivoire.....	4.64	69.67	100	Bangladesh.....	3.66	43.09
35	Senegal.....	4.61	68.98	101	Peru.....	3.64	42.34
36	Ghana.....	4.61	68.95	102	Burundi.....	3.63	42.12
37	Spain.....	4.61	68.91	103	Brunei Darussalam.....	3.62	41.99
38	Uganda.....	4.60	68.64	104	Egypt.....	3.62	41.93
39	Japan.....	4.60	68.61	105	El Salvador.....	3.61	41.63
40	China.....	4.58	68.12	106	Georgia.....	3.56	40.37
41	Gambia.....	4.54	66.86	107	Estonia.....	3.55	40.05
42	Saudi Arabia.....	4.52	66.33	108	Kyrgyzstan.....	3.54	39.58
43	Jordan.....	4.51	66.11	109	Namibia.....	3.51	39.00
44	Italy.....	4.48	65.32	110	Bolivia, Plurinational St.....	3.51	38.89
45	Trinidad and Tobago.....	4.48	65.30	111	Turkey.....	3.46	37.41
46	Jamaica.....	4.47	65.19	112	Lesotho.....	3.42	36.56
47	New Zealand.....	4.39	63.00	113	Panama.....	3.40	36.01
48	Greece.....	4.39	63.00	114	Yemen.....	3.39	35.59
49	Russian Federation.....	4.39	62.79	115	Cambodia.....	3.37	35.15
50	Ukraine.....	4.38	62.54	116	Bulgaria.....	3.34	34.36
51	Cameroon.....	4.37	62.31	117	Lithuania.....	3.32	33.83
52	Oman.....	4.35	61.72	118	Croatia.....	3.32	33.79
53	Sri Lanka.....	4.29	60.06	119	Czech Republic.....	3.32	33.67
54	Guatemala.....	4.28	59.95	120	Nicaragua.....	3.32	33.66
55	Colombia.....	4.27	59.64	121	Brazil.....	3.32	33.59
56	Mexico.....	4.27	59.62	122	Mozambique.....	3.31	33.36
57	Slovenia.....	4.26	59.40	123	North Macedonia.....	3.29	32.80
58	Luxembourg.....	4.25	59.11	124	Bosnia and Herzegovina.....	3.28	32.75
59	Pakistan.....	4.24	58.76	125	Slovakia.....	3.27	32.30
60	Rwanda.....	4.20	57.63	126	Venezuela, Bolivarian Rep.....	3.25	31.69
61	Zimbabwe.....	4.17	56.93	127	Romania.....	3.24	31.45
62	Tunisia.....	4.17	56.81	128	Paraguay.....	3.19	30.08
63	Poland.....	4.14	56.15	129	Moldova, Rep.....	3.15	29.14
64	Burkina Faso.....	4.14	56.04	130	Hungary.....	2.95	23.56
65	Argentina.....	4.10	55.11	131	Mongolia.....	2.64	15.19
66	Serbia.....	4.10	55.06	132	Angola.....	2.08	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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5.2.2 Relevance of education system to the economy

Average answer to the question: In your country, how well does the education system meet the needs of a competitive economy? [1 = not well at all; 7 = extremely well] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.15	100.00	67	Zambia.....	3.61	43.65
2	United States of America.....	6.01	96.93	68	Czech Republic.....	3.59	43.21
3	Singapore.....	5.79	91.96	69	Tanzania, United Rep.	3.56	42.49
4	Finland.....	5.71	90.22	70	Nepal.....	3.55	42.26
5	Ireland.....	5.50	85.63	71	Kazakhstan.....	3.53	41.96
6	Netherlands.....	5.43	83.99	72	Chile.....	3.52	41.63
7	Malaysia.....	5.30	81.11	73	Botswana.....	3.51	41.44
8	Germany.....	5.30	81.05	74	Ethiopia.....	3.49	41.06
9	Qatar.....	5.29	80.88	75	Bulgaria.....	3.48	40.89
10	Canada.....	5.19	78.62	76	Uganda.....	3.48	40.82
11	Norway.....	5.01	74.65	77	Poland.....	3.47	40.55
12	Denmark.....	4.98	74.07	78	Spain.....	3.46	40.25
13	United Arab Emirates.....	4.97	73.82	79	Eswatini.....	3.43	39.79
14	Sweden.....	4.94	73.21	80	Cameroon.....	3.43	39.67
15	Iceland.....	4.82	70.51	81	Serbia.....	3.42	39.42
16	Australia.....	4.81	70.24	82	Lesotho.....	3.42	39.39
17	Belgium.....	4.77	69.31	83	Colombia.....	3.40	39.05
18	India.....	4.74	68.66	84	Bangladesh.....	3.33	37.48
19	United Kingdom.....	4.73	68.53	85	Viet Nam.....	3.33	37.44
20	New Zealand.....	4.70	67.89	86	Lithuania.....	3.27	36.11
21	Philippines.....	4.69	67.66	87	Moldova, Rep.....	3.26	36.01
22	Malta.....	4.67	67.19	88	Namibia.....	3.25	35.82
23	Bahrain.....	4.64	66.47	89	Ecuador.....	3.25	35.64
24	Oman.....	4.61	65.93	90	Liberia.....	3.23	35.26
25	Israel.....	4.56	64.76	91	Honduras.....	3.21	34.76
26	Luxembourg.....	4.53	64.15	92	Tunisia.....	3.17	33.89
27	China.....	4.52	63.76	93	Algeria.....	3.16	33.72
28	Bhutan.....	4.50	63.40	94	Malawi.....	3.13	33.15
29	Brunei Darussalam.....	4.50	63.33	95	Côte d'Ivoire.....	3.13	32.99
30	Japan.....	4.50	63.32	96	Kyrgyzstan.....	3.11	32.56
31	Estonia.....	4.46	62.53	97	Mali.....	3.07	31.71
32	Kenya.....	4.46	62.51	98	Burundi.....	3.06	31.49
33	Saudi Arabia.....	4.44	62.09	99	Romania.....	3.05	31.39
34	Portugal.....	4.44	62.08	100	Georgia.....	3.05	31.33
35	Indonesia.....	4.42	61.73	101	Argentina.....	3.03	30.83
36	Albania.....	4.42	61.66	102	Iran, Islamic Rep.....	3.02	30.66
37	Azerbaijan.....	4.40	61.19	103	Madagascar.....	2.96	29.29
38	Gambia.....	4.35	60.04	104	Burkina Faso.....	2.96	29.24
39	Austria.....	4.30	58.99	105	Mexico.....	2.94	28.94
40	Jamaica.....	4.28	58.46	106	South Africa.....	2.93	28.72
41	Costa Rica.....	4.19	56.61	107	Turkey.....	2.91	28.22
42	Cyprus.....	4.18	56.26	108	Hungary.....	2.89	27.67
43	Ghana.....	4.14	55.45	109	Morocco.....	2.81	25.96
44	France.....	4.14	55.45	110	Greece.....	2.79	25.56
45	Montenegro.....	4.08	54.14	111	North Macedonia.....	2.79	25.45
46	Slovenia.....	4.07	53.97	112	Slovakia.....	2.76	24.80
47	Pakistan.....	4.03	53.08	113	Panama.....	2.75	24.63
48	Zimbabwe.....	4.02	52.77	114	Dominican Republic.....	2.74	24.46
49	Jordan.....	4.00	52.37	115	Congo, Dem. Rep.....	2.66	22.70
50	Tajikistan.....	3.99	52.09	116	Venezuela, Bolivarian Rep.....	2.65	22.45
51	Trinidad and Tobago.....	3.98	51.92	117	Croatia.....	2.60	21.40
52	Sri Lanka.....	3.94	51.04	118	Guatemala.....	2.58	20.81
53	Armenia.....	3.93	50.80	119	Mozambique.....	2.57	20.71
54	Mauritius.....	3.93	50.67	120	Mongolia.....	2.56	20.39
55	Lao PDR.....	3.92	50.49	121	Nigeria.....	2.55	20.22
56	Rwanda.....	3.91	50.26	122	Peru.....	2.54	19.99
57	Cabo Verde.....	3.89	49.89	123	Egypt.....	2.54	19.98
58	Ukraine.....	3.80	47.98	124	Bolivia, Plurinational St.....	2.53	19.73
59	Latvia.....	3.75	46.70	125	Uruguay.....	2.53	19.67
60	Kuwait.....	3.74	46.53	126	Brazil.....	2.35	15.86
61	Korea, Rep.....	3.73	46.44	127	Bosnia and Herzegovina.....	2.35	15.79
62	Russian Federation.....	3.73	46.32	128	Nicaragua.....	2.31	14.85
63	Thailand.....	3.72	46.03	129	Yemen.....	2.28	14.27
64	Cambodia.....	3.66	44.81	130	El Salvador.....	2.17	11.81
65	Italy.....	3.65	44.58	131	Paraguay.....	2.10	10.26
66	Senegal.....	3.64	44.33	132	Angola.....	1.64	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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5.2.3 Skills matching with secondary education

Average answer to the question: In your country, to what extent do graduating students possess the skills needed by businesses at the following levels: a. Secondary education [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	5.88	100.00	67	Montenegro.....	3.72	42.34
2	United States of America.....	5.77	97.06	68	Ecuador.....	3.72	42.33
3	Finland.....	5.38	86.52	69	Kazakhstan.....	3.70	41.93
4	Netherlands.....	5.34	85.60	70	Senegal.....	3.70	41.91
5	Germany.....	5.20	81.77	71	Cabo Verde.....	3.70	41.79
6	Malaysia.....	5.14	80.22	72	Jordan.....	3.66	40.71
7	Iceland.....	5.10	79.04	73	Slovakia.....	3.65	40.62
8	Singapore.....	5.05	77.93	74	Thailand.....	3.65	40.51
9	Sweden.....	5.00	76.38	75	Burkina Faso.....	3.64	40.30
10	Israel.....	4.88	73.17	76	Mexico.....	3.63	39.92
11	Denmark.....	4.82	71.58	77	Guatemala.....	3.59	38.96
12	Austria.....	4.81	71.30	78	Bulgaria.....	3.57	38.31
13	Luxembourg.....	4.80	71.18	79	Panama.....	3.50	36.63
14	United Arab Emirates.....	4.78	70.50	80	Ghana.....	3.50	36.54
15	Australia.....	4.74	69.67	81	South Africa.....	3.50	36.44
16	Cyprus.....	4.73	69.30	82	Namibia.....	3.44	35.05
17	New Zealand.....	4.70	68.60	83	Tanzania, United Rep.	3.44	35.02
18	Qatar.....	4.70	68.36	84	Hungary.....	3.44	34.86
19	Ireland.....	4.69	68.10	85	Argentina.....	3.43	34.71
20	Norway.....	4.68	67.99	86	Tunisia.....	3.43	34.66
21	Canada.....	4.66	67.41	87	Rwanda.....	3.42	34.44
22	Malta.....	4.63	66.64	88	Burundi.....	3.39	33.59
23	Portugal.....	4.62	66.35	89	Nepal.....	3.38	33.34
24	Azerbaijan.....	4.61	66.05	90	Turkey.....	3.38	33.27
25	Belgium.....	4.59	65.68	91	Eswatini.....	3.36	32.90
26	Costa Rica.....	4.58	65.28	92	Croatia.....	3.36	32.89
27	China.....	4.52	63.58	93	Côte d'Ivoire.....	3.36	32.79
28	Estonia.....	4.51	63.49	94	North Macedonia.....	3.36	32.78
29	India.....	4.50	63.19	95	Bolivia, Plurinational St.....	3.35	32.46
30	United Kingdom.....	4.42	61.04	96	El Salvador.....	3.32	31.68
31	Philippines.....	4.41	60.80	97	Iran, Islamic Rep.....	3.32	31.64
32	Slovenia.....	4.33	58.52	98	Uruguay.....	3.31	31.59
33	France.....	4.33	58.51	99	Zambia.....	3.31	31.40
34	Japan.....	4.32	58.35	100	Moldova, Rep.....	3.30	31.12
35	Indonesia.....	4.28	57.22	101	Kuwait.....	3.30	31.10
36	Czech Republic.....	4.27	57.09	102	Peru.....	3.29	31.02
37	Oman.....	4.25	56.44	103	Dominican Republic.....	3.27	30.43
38	Bahrain.....	4.24	56.26	104	Venezuela, Bolivarian Rep.....	3.25	29.99
39	Korea, Rep.....	4.24	56.22	105	Brazil.....	3.24	29.60
40	Mauritius.....	4.19	54.83	106	Poland.....	3.23	29.50
41	Sri Lanka.....	4.14	53.60	107	Madagascar.....	3.23	29.48
42	Serbia.....	4.13	53.27	108	Kyrgyzstan.....	3.23	29.28
43	Greece.....	4.10	52.62	109	Algeria.....	3.21	28.95
44	Pakistan.....	4.10	52.44	110	Lao PDR.....	3.21	28.94
45	Brunei Darussalam.....	4.08	51.99	111	Morocco.....	3.12	26.39
46	Albania.....	4.05	51.24	112	Lithuania.....	3.12	26.35
47	Spain.....	4.01	50.21	113	Viet Nam.....	3.10	25.83
48	Trinidad and Tobago.....	4.00	49.94	114	Georgia.....	3.09	25.62
49	Jamaica.....	4.00	49.85	115	Botswana.....	3.08	25.43
50	Tajikistan.....	3.98	49.29	116	Paraguay.....	3.08	25.40
51	Saudi Arabia.....	3.92	47.80	117	Nicaragua.....	3.08	25.38
52	Bhutan.....	3.92	47.79	118	Bangladesh.....	3.06	24.81
53	Chile.....	3.89	46.81	119	Bosnia and Herzegovina.....	3.02	23.75
54	Gambia.....	3.88	46.65	120	Liberia.....	3.02	23.73
55	Colombia.....	3.88	46.62	121	Lesotho.....	2.97	22.33
56	Russian Federation.....	3.85	45.94	122	Congo, Dem. Rep.....	2.94	21.60
57	Ukraine.....	3.85	45.92	123	Cambodia.....	2.90	20.69
58	Kenya.....	3.84	45.52	124	Ethiopia.....	2.90	20.49
59	Italy.....	3.83	45.45	125	Malawi.....	2.85	19.23
60	Mongolia.....	3.80	44.41	126	Romania.....	2.84	18.99
61	Mali.....	3.78	44.00	127	Uganda.....	2.73	15.94
62	Honduras.....	3.77	43.73	128	Nigeria.....	2.67	14.35
63	Cameroon.....	3.74	43.01	129	Egypt.....	2.61	12.77
64	Latvia.....	3.73	42.62	130	Mozambique.....	2.53	10.69
65	Armenia.....	3.73	42.61	131	Yemen.....	2.22	2.44
66	Zimbabwe.....	3.72	42.53	132	Angola.....	2.13	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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5.2.4 Skills matching with tertiary education

Average answer to the question: In your country, to what extent do graduating students possess the skills needed by businesses at the following levels: b. University level [1 = not at all; 7 = to a great extent] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	6.11	100.00	67	Albania.....	4.36	54.28
2	United States of America.....	5.99	97.08	68	Venezuela, Bolivarian Rep.....	4.35	54.22
3	Israel.....	5.66	88.40	69	Mauritius.....	4.35	54.14
4	Singapore.....	5.66	88.37	70	Serbia.....	4.34	53.92
5	Netherlands.....	5.66	88.29	71	Burundi.....	4.34	53.90
6	Ireland.....	5.53	85.03	72	Tajikistan.....	4.30	52.88
7	Sweden.....	5.53	84.96	73	Tanzania, United Rep.....	4.28	52.26
8	Belgium.....	5.50	84.23	74	Honduras.....	4.25	51.47
9	Iceland.....	5.50	84.05	75	South Africa.....	4.20	50.31
10	Finland.....	5.48	83.74	76	Jordan.....	4.19	50.07
11	Denmark.....	5.48	83.61	77	Panama.....	4.19	49.88
12	Malaysia.....	5.47	83.48	78	Rwanda.....	4.18	49.62
13	Germany.....	5.41	81.92	79	Nepal.....	4.16	49.09
14	Austria.....	5.40	81.53	80	Montenegro.....	4.13	48.47
15	Qatar.....	5.40	81.43	81	Peru.....	4.12	48.24
16	New Zealand.....	5.33	79.61	82	Cambodia.....	4.12	48.10
17	Canada.....	5.30	79.08	83	Russian Federation.....	4.12	48.08
18	Australia.....	5.28	78.48	84	Cameroon.....	4.10	47.66
19	Philippines.....	5.28	78.40	85	Zimbabwe.....	4.10	47.64
20	Norway.....	5.25	77.71	86	Dominican Republic.....	4.05	46.42
21	Costa Rica.....	5.23	77.21	87	Lithuania.....	4.05	46.22
22	United Arab Emirates.....	5.23	77.01	88	Turkey.....	4.04	46.04
23	United Kingdom.....	5.22	76.91	89	Liberia.....	4.04	46.02
24	Luxembourg.....	5.22	76.90	90	Madagascar.....	4.04	45.99
25	Chile.....	5.20	76.31	91	Côte d'Ivoire.....	4.03	45.90
26	Bahrain.....	5.19	76.08	92	Burkina Faso.....	4.02	45.42
27	Malta.....	5.12	74.13	93	Uganda.....	4.01	45.22
28	Cyprus.....	5.11	73.87	94	Cabo Verde.....	3.96	43.89
29	Indonesia.....	5.05	72.42	95	Hungary.....	3.96	43.87
30	Portugal.....	4.98	70.59	96	Mali.....	3.95	43.74
31	France.....	4.98	70.48	97	Namibia.....	3.93	43.32
32	Estonia.....	4.95	69.79	98	Armenia.....	3.92	42.98
33	Jamaica.....	4.91	68.79	99	Malawi.....	3.90	42.39
34	Gambia.....	4.91	68.72	100	Ethiopia.....	3.89	42.25
35	Uruguay.....	4.84	67.06	101	Kuwait.....	3.89	42.02
36	Oman.....	4.82	66.42	102	Eswatini.....	3.89	42.02
37	Azerbaijan.....	4.81	66.03	103	Poland.....	3.86	41.25
38	India.....	4.76	64.93	104	Bolivia, Plurinational St.....	3.85	41.00
39	Lesotho.....	4.76	64.81	105	Morocco.....	3.80	39.82
40	Japan.....	4.71	63.51	106	Tunisia.....	3.78	39.27
41	Saudi Arabia.....	4.70	63.26	107	El Salvador.....	3.78	39.18
42	Spain.....	4.69	62.91	108	Botswana.....	3.76	38.78
43	Sri Lanka.....	4.68	62.82	109	Bangladesh.....	3.75	38.49
44	Ghana.....	4.66	62.26	110	Slovakia.....	3.75	38.41
45	Colombia.....	4.65	61.90	111	Kazakhstan.....	3.74	38.36
46	Lao PDR.....	4.65	61.86	112	Romania.....	3.70	37.14
47	Czech Republic.....	4.64	61.74	113	Bulgaria.....	3.69	37.02
48	Korea, Rep.....	4.62	61.31	114	Georgia.....	3.69	36.81
49	Thailand.....	4.62	61.29	115	Algeria.....	3.68	36.64
50	Greece.....	4.61	60.97	116	Iran, Islamic Rep.....	3.66	36.23
51	Guatemala.....	4.60	60.69	117	Moldova, Rep.....	3.64	35.55
52	Mexico.....	4.59	60.38	118	Paraguay.....	3.63	35.36
53	Brunei Darussalam.....	4.59	60.33	119	Congo, Dem. Rep.....	3.63	35.25
54	China.....	4.58	60.14	120	North Macedonia.....	3.59	34.32
55	Bhutan.....	4.57	60.00	121	Croatia.....	3.56	33.65
56	Argentina.....	4.57	59.80	122	Viet Nam.....	3.53	32.88
57	Kenya.....	4.56	59.60	123	Brazil.....	3.52	32.58
58	Pakistan.....	4.47	57.38	124	Nicaragua.....	3.45	30.73
59	Italy.....	4.44	56.50	125	Kyrgyzstan.....	3.39	29.09
60	Ecuador.....	4.43	56.32	126	Bosnia and Herzegovina.....	3.30	26.76
61	Senegal.....	4.43	56.28	127	Egypt.....	3.22	24.54
62	Zambia.....	4.42	56.08	128	Nigeria.....	3.18	23.67
63	Latvia.....	4.41	55.82	129	Mozambique.....	3.12	21.93
64	Ukraine.....	4.40	55.56	130	Yemen.....	3.11	21.83
65	Trinidad and Tobago.....	4.39	55.23	131	Mongolia.....	3.03	19.76
66	Slovenia.....	4.36	54.52	132	Angola.....	2.28	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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Pillar 6

Global Knowledge Skills

6.1.1 Workforce with tertiary education

Labour force with tertiary education (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Canada.....	65.91	100.00	67	Costa Rica	19.20	28.44
2	Singapore.....	54.62	82.70	68	Kuwait	19.11	28.31
3	Ukraine	53.40	80.84	69	Albania.....	19.01	28.16
4	Russian Federation	51.36	77.72	70	Mauritius.....	18.55	27.45
5	Japan.....	48.86	73.89	71	Chile.....	18.23	26.96
6	United States of America.....	47.65	72.02	72	Kyrgyzstan.....	18.20	26.91
7	Ireland	46.83	70.77	73	Qatar.....	18.18	26.88
8	Cyprus	45.70	69.05	74	Mexico.....	17.70	26.14
9	Korea, Rep.	45.60	68.89	75	Thailand	16.38	24.12
10	Belgium.....	45.34	68.50	76	South Africa.....	15.90	23.38
11	Luxembourg	44.89	67.80	77	Botswana.....	15.86	23.33
12	Lithuania.....	43.45	65.59	78	Tajikistan.....	15.84	23.29
13	Norway.....	43.25	65.29	79	Panama.....	15.77	23.18
14	Finland.....	42.99	64.89	80	Ecuador	15.67	23.04
15	United Kingdom	42.97	64.85	81	Eswatini.....	14.89	21.84
16	Sweden	41.05	61.91	82	Cabo Verde.....	14.83	21.75
17	Switzerland.....	41.01	61.86	83	Paraguay.....	14.62	21.42
18	Estonia	40.53	61.12	84	Uruguay	14.23	20.82
19	Spain	39.93	60.20	85	Nigeria.....	13.66	19.96
20	France.....	39.80	60.00	86	Zambia.....	12.99	18.93
21	Iceland	38.73	58.36	87	Lao PDR.....	12.83	18.68
22	Australia	38.15	57.48	88	Bosnia and Herzegovina.....	12.79	18.63
23	Netherlands.....	36.70	55.25	89	Viet Nam.....	12.49	18.16
24	United Arab Emirates.....	36.59	55.08	90	Dominican Republic.....	12.40	18.03
25	Denmark.....	36.03	54.23	91	Indonesia.....	12.20	17.72
26	Latvia.....	35.85	53.95	92	Namibia.....	11.40	16.49
27	Kazakhstan.....	35.08	52.78	93	Zimbabwe.....	11.35	16.41
28	Poland.....	34.76	52.29	94	India.....	9.95	14.28
29	Slovenia.....	34.76	52.28	95	Nicaragua.....	9.85	14.12
30	Israel.....	34.56	51.98	96	Bahrain.....	9.84	14.10
31	Greece.....	34.45	51.81	97	Nepal.....	9.37	13.38
32	Austria.....	34.28	51.54	98	Uganda.....	9.25	13.20
33	Georgia.....	34.20	51.42	99	Morocco.....	9.10	12.97
34	New Zealand	31.79	47.74	100	Pakistan.....	8.65	12.29
35	Mongolia.....	31.56	47.37	101	Ghana.....	8.29	11.72
36	Bulgaria.....	30.69	46.05	102	Rwanda.....	8.16	11.53
37	Malta	29.94	44.90	103	Yemen.....	7.91	11.15
38	Peru.....	29.87	44.79	104	El Salvador.....	7.74	10.89
39	Venezuela, Bolivarian Rep.....	29.82	44.71	105	Bangladesh.....	6.46	8.93
40	Armenia.....	29.67	44.49	106	Côte d'Ivoire.....	6.46	8.92
41	Germany.....	29.03	43.51	107	Congo, Dem. Rep.	6.36	8.77
42	Croatia.....	28.88	43.28	108	Cameroon.....	6.27	8.64
43	Colombia.....	28.59	42.83	109	Honduras.....	6.00	8.22
44	Montenegro.....	27.68	41.43	110	Cambodia.....	5.96	8.16
45	Saudi Arabia.....	27.13	40.60	111	Senegal.....	5.62	7.63
46	Azerbaijan.....	26.75	40.01	112	Sri Lanka.....	5.18	6.97
47	Portugal	26.34	39.38	113	Bhutan.....	5.09	6.82
48	Hungary.....	26.25	39.25	114	Madagascar.....	4.80	6.38
49	Serbia.....	25.69	38.38	115	Lesotho.....	4.47	5.87
50	Philippines.....	25.52	38.12	116	Guatemala.....	4.34	5.68
51	Slovakia.....	25.10	37.49	117	Kenya	4.13	5.35
52	Czech Republic.....	24.75	36.94	118	Liberia.....	3.87	4.96
53	North Macedonia.....	24.41	36.43	119	Angola.....	3.43	4.28
54	Moldova, Rep.	24.24	36.16	120	Mozambique	2.07	2.20
55	Turkey	23.75	35.41	121	Mali.....	2.01	2.11
56	Malaysia.....	23.50	35.03	122	Burkina Faso.....	1.73	1.67
57	Algeria.....	22.73	33.85	123	Malawi.....	1.40	1.18
58	Italy.....	22.00	32.74	124	Ethiopia.....	1.18	0.84
59	Argentina.....	21.97	32.69	125	Tanzania, United Rep.	1.11	0.73
60	Trinidad and Tobago.....	21.85	32.50	126	Burundi.....	0.83	0.31
61	Brunei Darussalam.....	20.78	30.87	127	Gambia.....	0.63	0.00
62	Brazil.....	20.71	30.75		China.....	n/a	n/a
63	Bolivia, Plurinational St.....	20.10	29.82		Iran, Islamic Rep.....	n/a	n/a
64	Romania.....	20.08	29.80		Jamaica.....	n/a	n/a
65	Tunisia.....	19.36	28.69		Jordan.....	n/a	n/a
66	Egypt.....	19.22	28.47		Oman.....	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

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6.1.2 Population with tertiary education

Population with tertiary education (%) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Russian Federation	61.93	100.00	67	Romania	14.61	22.21
2	Kazakhstan	52.38	84.30	68	Italy	14.35	21.79
3	Canada	47.67	76.56	69	Sri Lanka	14.11	21.39
4	Armenia	47.32	75.99	70	Paraguay	14.05	21.29
5	Israel	47.07	75.58	71	Oman	14.03	21.27
6	Singapore	43.85	70.28	72	Brazil	13.56	20.49
7	United States of America	43.51	69.72	73	Uruguay	13.17	19.84
8	Australia	41.39	66.23	74	Albania	12.90	19.41
9	Korea, Rep.	40.30	64.45	75	Dominican Republic	12.38	18.55
10	United Kingdom	38.98	62.27	76	Bahrain	12.15	18.18
11	Estonia	37.80	60.33	77	Bosnia and Herzegovina	11.09	16.42
12	Norway	37.23	59.40	78	Honduras	10.79	15.94
13	Ireland	36.66	58.45	79	India	9.89	14.46
14	Switzerland	36.62	58.39	80	Cabo Verde	9.77	14.27
15	Cyprus	36.50	58.19	81	Trinidad and Tobago	9.61	14.00
16	Denmark	35.42	56.42	82	Kuwait	9.52	13.85
17	United Arab Emirates	34.86	55.50	83	Indonesia	9.40	13.65
18	Japan	34.40	54.74	84	Congo, Dem. Rep.	9.12	13.19
19	Finland	34.35	54.66	85	Bangladesh	8.85	12.75
20	Venezuela, Bolivarian Rep.	34.29	54.56	86	China	8.81	12.69
21	Luxembourg	34.28	54.54	87	Pakistan	8.62	12.37
22	Lithuania	33.86	53.85	88	Guatemala	8.53	12.22
23	Moldova, Rep.	33.07	52.56	89	Uganda	8.15	11.59
24	Georgia	32.86	52.21	90	Algeria	8.03	11.40
25	Belgium	32.54	51.69	91	El Salvador	7.95	11.27
26	New Zealand	32.31	51.31	92	South Africa	7.82	11.05
27	Sweden	32.23	51.18	93	Viet Nam	6.70	9.21
28	Latvia	31.63	50.19	94	Côte d'Ivoire	5.31	6.93
29	Netherlands	31.51	49.99	95	Mauritius	5.28	6.87
30	Spain	29.79	47.17	96	Nepal	4.62	5.80
31	France	29.51	46.71	97	Bhutan	4.55	5.68
32	Austria	27.45	43.32	98	Senegal	4.03	4.83
33	Slovenia	26.95	42.50	99	Zimbabwe	3.40	3.79
34	Philippines	26.59	41.90	100	Rwanda	3.32	3.67
35	Germany	26.18	41.23	101	Ghana	3.13	3.35
36	Azerbaijan	25.47	40.06	102	Angola	2.63	2.53
37	Poland	25.03	39.35	103	Kenya	2.18	1.79
38	Cambodia	24.78	38.93	104	Mali	2.06	1.59
39	Bulgaria	24.63	38.68	105	Tanzania, United Rep.	1.93	1.37
40	Bolivia, Plurinational St.	24.01	37.66	106	Lesotho	1.89	1.31
41	Mongolia	23.71	37.18	107	Mozambique	1.81	1.17
42	Iran, Islamic Rep.	23.06	36.11	108	Cameroon	1.44	0.58
43	Tajikistan	22.75	35.59	109	Burundi	1.35	0.43
44	Costa Rica	21.45	33.45	110	Ethiopia	1.09	0.00
45	Hungary	21.40	33.37		Botswana	n/a	n/a
46	Panama	21.36	33.31		Brunei Darussalam	n/a	n/a
47	Greece	21.20	33.05		Burkina Faso	n/a	n/a
48	Saudi Arabia	20.98	32.69		Ecuador	n/a	n/a
49	Peru	20.88	32.52		Egypt	n/a	n/a
50	Serbia	20.69	32.21		Eswatini	n/a	n/a
51	Czech Republic	20.24	31.47		Gambia	n/a	n/a
52	Colombia	20.14	31.30		Iceland	n/a	n/a
53	Chile	19.81	30.76		Jamaica	n/a	n/a
54	Montenegro	19.57	30.37		Lao PDR	n/a	n/a
55	Argentina	19.42	30.13		Liberia	n/a	n/a
56	Thailand	19.07	29.54		Madagascar	n/a	n/a
57	Portugal	19.00	29.44		Malawi	n/a	n/a
58	Malaysia	18.84	29.17		Morocco	n/a	n/a
59	Slovakia	18.81	29.12		Namibia	n/a	n/a
60	Croatia	18.29	28.27		Nicaragua	n/a	n/a
61	Kyrgyzstan	17.62	27.17		Nigeria	n/a	n/a
62	Malta	16.78	25.79		North Macedonia	n/a	n/a
63	Turkey	16.52	25.36		Qatar	n/a	n/a
64	Jordan	16.18	24.80		Ukraine	n/a	n/a
65	Tunisia	15.16	23.12		Yemen	n/a	n/a
66	Mexico	15.15	23.11		Zambia	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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6.1.3 Professionals

Professionals (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Luxembourg	37.87	100.00	67	Argentina	10.01	25.71
2	Sweden	28.74	75.63	68	Algeria	9.93	25.49
3	Norway	27.27	71.72	69	Mexico	9.57	24.54
4	Denmark	26.90	70.74	70	Mauritius	9.56	24.50
5	Netherlands	26.51	69.70	71	Kyrgyzstan	9.38	24.02
6	Iceland	25.76	67.70	72	Cabo Verde	9.24	23.65
7	Israel	25.67	67.46	73	Qatar	9.07	23.20
8	Switzerland	25.35	66.62	74	Jamaica	8.91	22.77
9	United Kingdom	25.28	66.41	75	Bhutan	8.68	22.16
10	Finland	25.25	66.35	76	Nepal	8.18	20.83
11	Belgium	25.10	65.93	77	Lao PDR	7.87	20.00
12	Russian Federation	24.57	64.52	78	Zambia	7.81	19.85
13	Lithuania	23.40	61.42	79	Dominican Republic	7.79	19.78
14	Ireland	23.38	61.37	80	Namibia	7.64	19.38
15	United States of America	22.38	58.69	81	Bahrain	7.61	19.30
16	Slovenia	22.22	58.26	82	Tajikistan	7.58	19.22
17	Australia	22.04	57.78	83	Ghana	7.46	18.90
18	Estonia	20.84	54.57	84	Ecuador	7.43	18.82
19	Singapore	20.03	52.42	85	Oman	7.37	18.66
20	Korea, Rep.	20.01	52.37	86	Yemen	7.25	18.35
21	Austria	19.96	52.23	87	Viet Nam	7.20	18.22
22	Poland	19.93	52.16	88	Bolivia, Plurinational St.	7.19	18.17
23	Greece	19.26	50.36	89	El Salvador	6.88	17.35
24	Montenegro	18.93	49.49	90	Sri Lanka	6.80	17.14
25	Cyprus	18.91	49.44	91	Botswana	6.77	17.06
26	Portugal	18.88	49.35	92	Tunisia	6.75	17.01
27	Canada	18.73	48.95	93	Paraguay	6.50	16.34
28	France	18.45	48.21	94	Liberia	6.26	15.70
29	Ukraine	18.41	48.10	95	Nigeria	6.14	15.39
30	Malta	18.13	47.35	96	Trinidad and Tobago	6.10	15.29
31	Germany	17.90	46.74	97	Uganda	5.90	14.74
32	Spain	17.90	46.73	98	Guatemala	5.61	13.97
33	Croatia	17.75	46.34	99	Thailand	5.56	13.83
34	Brunei Darussalam	17.05	44.47	100	South Africa	5.52	13.73
35	Kazakhstan	17.02	44.39	101	Philippines	5.45	13.54
36	Latvia	16.99	44.31	102	Angola	5.41	13.44
37	New Zealand	16.81	43.83	103	Rwanda	5.37	13.34
38	Bulgaria	16.65	43.40	104	Pakistan	5.26	13.03
39	Czech Republic	16.08	41.90	105	Nicaragua	5.21	12.90
40	Romania	15.37	40.00	106	Cameroon	5.04	12.44
41	Hungary	15.36	39.96	107	Bangladesh	4.82	11.87
42	Italy	15.04	39.12	108	Côte d'Ivoire	4.74	11.65
43	Venezuela, Bolivarian Rep.	15.01	39.04	109	Honduras	4.23	10.30
44	North Macedonia	14.91	38.77	110	Senegal	4.06	9.83
45	Mongolia	14.64	38.04	111	Gambia	3.76	9.04
46	Armenia	14.49	37.66	112	India	3.71	8.91
47	Moldova, Rep.	14.23	36.95	113	Zimbabwe	3.48	8.29
48	Serbia	13.91	36.10	114	Cambodia	3.42	8.13
49	United Arab Emirates	13.60	35.27	115	Mali	3.12	7.33
50	Costa Rica	12.68	32.83	116	Malawi	2.96	6.90
51	Azerbaijan	12.64	32.72	117	Saudi Arabia	2.73	6.29
52	Slovakia	12.53	32.43	118	Ethiopia	2.56	5.83
53	Chile	12.48	32.29	119	Congo, Dem. Rep.	2.40	5.41
54	Malaysia	12.39	32.05	120	Colombia	2.19	4.85
55	Georgia	12.28	31.76	121	Madagascar	2.05	4.48
56	Uruguay	12.12	31.33	122	Mozambique	2.04	4.46
57	Eswatini	11.94	30.84	123	Morocco	1.80	3.81
58	Bosnia and Herzegovina	11.46	29.56	124	Indonesia	1.27	2.40
59	Albania	11.31	29.17	125	Lesotho	1.18	2.16
60	Egypt	11.27	29.07	126	Tanzania, United Rep.	0.85	1.27
61	Peru	11.15	28.74	127	Burundi	0.37	0.00
62	Brazil	11.00	28.35		Burkina Faso	n/a	n/a
63	Panama	10.85	27.96		China	n/a	n/a
64	Kuwait	10.45	26.88		Japan	n/a	n/a
65	Turkey	10.44	26.84		Jordan	n/a	n/a
66	Iran, Islamic Rep.	10.05	25.81		Kenya	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

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6.1.4 Researchers

Full-time equivalent researchers (per million population) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Israel	8,250.47	100.00	67	Chile	502.10	5.97
2	Denmark	7,896.85	95.71	68	South Africa	493.72	5.86
3	Sweden	7,592.50	92.01	69	Kuwait	491.81	5.84
4	Korea, Rep.	7,514.39	91.07	70	Bosnia and Herzegovina	463.90	5.50
5	Singapore	6,729.68	81.54	71	Ecuador	400.71	4.73
6	Finland	6,707.49	81.27	72	Bahrain	368.90	4.35
7	Iceland	6,635.11	80.40	73	Pakistan	354.13	4.17
8	Norway	6,477.76	78.49	74	Venezuela, Bolivarian Rep.	283.93	3.32
9	Japan	5,304.90	64.25	75	Mexico	244.18	2.84
10	Switzerland	5,257.36	63.68	76	Oman	243.96	2.83
11	Austria	5,157.52	62.46	77	Kenya	225.03	2.60
12	Germany	5,036.18	60.99	78	India	216.18	2.50
13	Netherlands	5,007.06	60.64	79	Indonesia	215.73	2.49
14	Belgium	4,941.98	59.85	80	Philippines	187.66	2.15
15	Luxembourg	4,682.45	56.70	81	Botswana	179.47	2.05
16	Australia	4,539.49	54.96	82	Bolivia, Plurinational St.	165.95	1.89
17	Slovenia	4,467.84	54.09	83	Albania	156.10	1.77
18	France	4,441.07	53.77	84	Namibia	143.32	1.61
19	United Kingdom	4,376.96	52.99	85	Paraguay	122.05	1.35
20	Portugal	4,290.82	51.95	86	Eswatini	119.14	1.32
21	Canada	4,274.70	51.75	87	Sri Lanka	106.98	1.17
22	United States of America	4,256.29	51.53	88	Zimbabwe	88.72	0.95
23	Ireland	4,107.60	49.72	89	Colombia	88.48	0.95
24	New Zealand	4,052.42	49.05	90	El Salvador	65.88	0.67
25	Czech Republic	3,689.92	44.65	91	Cabo Verde	49.21	0.47
26	Estonia	3,568.94	43.18	92	Malawi	48.27	0.46
27	Greece	3,152.84	38.13	93	Burkina Faso	47.58	0.45
28	Lithuania	3,013.19	36.44	94	Angola	47.48	0.45
29	Hungary	2,924.02	35.36	95	Ethiopia	44.97	0.42
30	Spain	2,873.41	34.74	96	Mozambique	41.48	0.38
31	Russian Federation	2,851.71	34.48	97	Zambia	40.97	0.37
32	Slovakia	2,794.96	33.79	98	Panama	39.08	0.35
33	Poland	2,528.04	30.55	99	Ghana	38.37	0.34
34	United Arab Emirates	2,406.57	29.08	100	Gambia	33.56	0.28
35	Malaysia	2,357.92	28.49	101	Mali	32.81	0.27
36	Italy	2,294.55	27.72	102	Madagascar	30.62	0.24
37	Bulgaria	2,130.55	25.73	103	Cambodia	30.37	0.24
38	Serbia	2,079.20	25.11	104	Uganda	26.47	0.19
39	Malta	2,075.04	25.05	105	Lesotho	22.83	0.15
40	Tunisia	1,964.97	23.72	106	Honduras	22.77	0.15
41	Croatia	1,865.44	22.51	107	Guatemala	22.15	0.14
42	Latvia	1,785.94	21.55	108	Tanzania, United Rep.	18.34	0.09
43	Turkey	1,385.76	16.69	109	Rwanda	12.35	0.02
44	Georgia	1,339.71	16.13	110	Congo, Dem. Rep.	10.57	0.00
45	China	1,234.78	14.86		Armenia	n/a	n/a
46	Argentina	1,232.60	14.83		Azerbaijan	n/a	n/a
47	Thailand	1,210.35	14.56		Bangladesh	n/a	n/a
48	Cyprus	1,174.45	14.12		Bhutan	n/a	n/a
49	Morocco	1,068.96	12.84		Brunei Darussalam	n/a	n/a
50	Ukraine	994.08	11.94		Burundi	n/a	n/a
51	Romania	890.17	10.67		Cameroon	n/a	n/a
52	Brazil	881.38	10.57		Côte d'Ivoire	n/a	n/a
53	Algeria	820.75	9.83		Dominican Republic	n/a	n/a
54	Mauritius	778.49	9.32		Jamaica	n/a	n/a
55	North Macedonia	728.95	8.72		Kyrgyzstan	n/a	n/a
56	Moldova, Rep.	723.88	8.66		Lao PDR	n/a	n/a
57	Montenegro	714.27	8.54		Liberia	n/a	n/a
58	Viet Nam	700.78	8.38		Mongolia	n/a	n/a
59	Iran, Islamic Rep.	671.02	8.02		Nepal	n/a	n/a
60	Egypt	669.39	8.00		Nicaragua	n/a	n/a
61	Uruguay	667.68	7.97		Nigeria	n/a	n/a
62	Kazakhstan	661.59	7.90		Peru	n/a	n/a
63	Qatar	603.79	7.20		Saudi Arabia	n/a	n/a
64	Jordan	601.09	7.17		Tajikistan	n/a	n/a
65	Senegal	549.32	6.54		Trinidad and Tobago	n/a	n/a
66	Costa Rica	529.93	6.30		Yemen	n/a	n/a

SOURCE: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

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6.1.5 Senior officials and managers

Legislators, senior officials, and managers (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Philippines	16.01	100.00	67	Thailand	3.68	21.42
1	Saudi Arabia	28.13	100.00	68	Oman	3.68	21.42
3	Singapore	15.33	95.68	69	Botswana	3.35	19.31
4	New Zealand	13.67	85.10	70	Finland	3.33	19.21
5	Estonia	12.46	77.36	71	Mexico	3.20	18.33
6	Egypt	11.79	73.10	72	Algeria	3.17	18.17
7	United Kingdom	11.31	70.05	73	Cabo Verde	3.14	17.98
8	Australia	11.13	68.91	74	Iran, Islamic Rep.	2.97	16.89
9	Lao PDR	10.78	66.66	75	Honduras	2.95	16.77
10	United States of America	10.76	66.54	76	Cameroon	2.94	16.73
11	Trinidad and Tobago	10.44	64.49	77	Serbia	2.88	16.31
12	Malta	10.33	63.83	78	Greece	2.85	16.13
13	Iceland	10.27	63.40	79	Tajikistan	2.72	15.28
14	Latvia	9.96	61.44	80	Denmark	2.68	15.04
15	Israel	9.89	61.00	81	Uruguay	2.51	13.99
16	Brunei Darussalam	9.83	60.63	82	Bosnia and Herzegovina	2.47	13.68
17	Switzerland	9.44	58.11	83	Bolivia, Plurinational St.	2.43	13.45
18	Lithuania	9.18	56.46	84	Pakistan	2.36	13.01
19	South Africa	8.88	54.54	85	Chile	2.28	12.52
20	Norway	8.80	54.04	86	Qatar	2.24	12.24
21	United Arab Emirates	8.80	54.03	87	Dominican Republic	2.15	11.69
22	Ireland	8.65	53.10	88	Ghana	2.15	11.67
23	Canada	8.16	49.98	89	Luxembourg	2.13	11.51
24	Bahrain	8.10	49.59	90	Bhutan	2.02	10.84
25	Ukraine	8.07	49.40	91	Japan	2.01	10.77
26	Belgium	7.95	48.66	92	Zambia	2.00	10.72
27	Slovenia	7.29	44.41	93	Nicaragua	1.99	10.67
28	France	7.25	44.15	94	Eswatini	1.99	10.64
29	India	7.16	43.62	95	Costa Rica	1.93	10.27
30	Indonesia	7.16	43.59	96	Angola	1.90	10.07
31	Jamaica	7.12	43.35	97	Romania	1.89	10.00
32	Sri Lanka	6.83	41.50	98	El Salvador	1.73	8.96
33	Tunisia	6.62	40.16	99	Bangladesh	1.64	8.40
34	Russian Federation	6.57	39.84	100	Yemen	1.63	8.36
35	Mongolia	6.55	39.74	101	Kyrgyzstan	1.61	8.22
36	Moldova, Rep.	6.35	38.41	102	Korea, Rep.	1.56	7.90
37	Poland	6.21	37.53	103	Rwanda	1.40	6.88
38	Sweden	6.18	37.33	104	Lesotho	1.38	6.76
39	Armenia	6.09	36.77	105	Congo, Dem. Rep.	1.34	6.50
40	Colombia	5.75	34.61	106	Uganda	1.27	6.06
41	Portugal	5.58	33.51	107	Liberia	1.25	5.93
42	Georgia	5.57	33.44	108	Azerbaijan	1.25	5.93
43	Bulgaria	5.53	33.20	109	Côte d'Ivoire	1.21	5.66
44	Panama	5.44	32.66	110	Ecuador	1.20	5.63
45	Montenegro	5.40	32.39	111	Albania	1.20	5.61
46	Kazakhstan	5.23	31.30	112	Nepal	1.19	5.57
47	Turkey	5.17	30.94	113	Nigeria	1.16	5.38
48	Netherlands	5.16	30.83	114	Viet Nam	1.14	5.26
49	Namibia	4.98	29.73	115	Mali	1.13	5.16
50	Argentina	4.97	29.64	116	Zimbabwe	1.05	4.65
51	Croatia	4.91	29.25	117	Cambodia	0.91	3.73
52	Kuwait	4.71	27.98	118	Senegal	0.86	3.45
53	Germany	4.71	27.98	119	Guatemala	0.80	3.08
54	Austria	4.66	27.66	120	Madagascar	0.75	2.77
55	Malaysia	4.65	27.60	121	Peru	0.72	2.53
56	Czech Republic	4.63	27.46	122	Morocco	0.70	2.42
57	Brazil	4.47	26.49	123	Ethiopia	0.65	2.11
58	Hungary	4.42	26.13	124	Malawi	0.55	1.49
59	Slovakia	4.39	25.92	125	Gambia	0.46	0.86
60	Paraguay	4.29	25.29	126	Tanzania, United Rep.	0.45	0.84
61	Venezuela, Bolivarian Rep.	4.16	24.48	127	Mozambique	0.34	0.16
62	Spain	4.14	24.33	128	Burundi	0.32	0.00
63	Cyprus	3.91	22.89		Burkina Faso	n/a	n/a
64	North Macedonia	3.89	22.78		China	n/a	n/a
65	Mauritius	3.77	21.96		Jordan	n/a	n/a
66	Italy	3.72	21.67		Kenya	n/a	n/a

SOURCE: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

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6.1.6 Availability of scientists and engineers

Average answer to the question: In your country, to what extent are scientists and engineers available? [1 = not at all; 7 = widely available] | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	United States of America.....	5.85	100.00	67	Czech Republic.....	3.94	48.81
2	Finland.....	5.80	98.64	68	Panama.....	3.86	46.66
3	Malaysia.....	5.44	88.90	69	Rwanda.....	3.85	46.43
4	Japan.....	5.32	85.93	70	Guatemala.....	3.84	46.07
5	Canada.....	5.32	85.84	71	Kuwait.....	3.84	45.95
6	Israel.....	5.22	83.20	72	Malta.....	3.83	45.66
7	Switzerland.....	5.16	81.44	73	Algeria.....	3.81	45.29
8	Qatar.....	5.15	81.22	74	Mongolia.....	3.78	44.32
9	United Arab Emirates.....	5.14	80.89	75	Jamaica.....	3.77	44.26
10	Singapore.....	5.13	80.63	76	Viet Nam.....	3.77	44.06
11	Germany.....	5.12	80.50	77	Albania.....	3.75	43.55
12	Greece.....	5.08	79.42	78	South Africa.....	3.74	43.34
13	Norway.....	5.03	78.08	79	Colombia.....	3.73	43.21
14	United Kingdom.....	4.98	76.74	80	Argentina.....	3.73	43.14
15	Sweden.....	4.93	75.38	81	Hungary.....	3.72	42.80
16	Jordan.....	4.93	75.37	82	Bangladesh.....	3.69	42.06
17	Cyprus.....	4.85	73.29	83	Kazakhstan.....	3.69	41.94
18	Australia.....	4.85	73.19	84	Senegal.....	3.69	41.94
19	India.....	4.84	72.98	85	Mauritius.....	3.67	41.56
20	Iceland.....	4.79	71.60	86	Madagascar.....	3.66	41.07
21	Chile.....	4.78	71.42	87	Nigeria.....	3.65	40.95
22	Saudi Arabia.....	4.78	71.23	88	Honduras.....	3.62	40.01
23	Netherlands.....	4.78	71.22	89	Turkey.....	3.60	39.66
24	Azerbaijan.....	4.75	70.43	90	Ethiopia.....	3.60	39.57
25	France.....	4.71	69.32	91	Cameroon.....	3.59	39.37
26	Ireland.....	4.69	69.00	92	Namibia.....	3.59	39.32
27	China.....	4.68	68.58	93	Mali.....	3.59	39.21
28	Indonesia.....	4.67	68.42	94	Bulgaria.....	3.57	38.85
29	Korea, Rep.....	4.66	68.09	95	Dominican Republic.....	3.54	38.09
30	Philippines.....	4.63	67.32	96	Brunei Darussalam.....	3.53	37.75
31	Portugal.....	4.58	65.91	97	Latvia.....	3.50	36.84
32	Iran, Islamic Rep.....	4.56	65.45	98	Congo, Dem. Rep.....	3.48	36.43
33	Tunisia.....	4.53	64.44	99	Botswana.....	3.48	36.40
34	Spain.....	4.48	63.13	100	Ecuador.....	3.48	36.29
35	Oman.....	4.46	62.73	101	Romania.....	3.47	36.19
36	New Zealand.....	4.46	62.66	102	Gambia.....	3.46	35.79
37	Kenya.....	4.45	62.51	103	Uruguay.....	3.46	35.75
38	Costa Rica.....	4.45	62.45	104	Peru.....	3.44	35.41
39	Denmark.....	4.45	62.43	105	Slovakia.....	3.44	35.29
40	Italy.....	4.42	61.64	106	Nepal.....	3.42	34.82
41	Ukraine.....	4.42	61.54	107	Malawi.....	3.42	34.73
42	Bahrain.....	4.38	60.55	108	Cabo Verde.....	3.39	34.08
43	Estonia.....	4.38	60.51	109	Brazil.....	3.39	33.96
44	Egypt.....	4.37	60.21	110	Lao PDR.....	3.33	32.41
45	Russian Federation.....	4.36	60.14	111	Yemen.....	3.32	32.13
46	Austria.....	4.31	58.63	112	Croatia.....	3.28	31.03
47	Armenia.....	4.29	58.18	113	Bosnia and Herzegovina.....	3.27	30.85
48	Belgium.....	4.27	57.53	114	Kyrgyzstan.....	3.26	30.41
49	Mexico.....	4.24	56.87	115	Bhutan.....	3.24	29.92
50	Trinidad and Tobago.....	4.24	56.80	116	Lesotho.....	3.20	28.97
51	Lithuania.....	4.22	56.38	117	Cambodia.....	3.18	28.26
52	Thailand.....	4.21	55.98	118	Zimbabwe.....	3.09	25.77
53	Sri Lanka.....	4.20	55.76	119	North Macedonia.....	3.07	25.42
54	Tajikistan.....	4.18	55.09	120	Burkina Faso.....	3.07	25.39
55	Uganda.....	4.12	53.56	121	Burundi.....	3.05	24.87
56	Luxembourg.....	4.09	52.76	122	Bolivia, Plurinational St.....	3.02	24.00
57	Pakistan.....	4.09	52.76	123	Moldova, Rep.....	3.00	23.41
58	Serbia.....	4.08	52.50	124	Mozambique.....	2.98	22.87
59	Morocco.....	4.06	51.99	125	Georgia.....	2.97	22.69
60	Tanzania, United Rep.....	4.05	51.63	126	Nicaragua.....	2.95	22.23
61	Poland.....	4.05	51.55	127	Eswatini.....	2.92	21.35
62	Côte d'Ivoire.....	4.03	51.25	128	Paraguay.....	2.80	18.01
63	Montenegro.....	4.01	50.61	129	Liberia.....	2.70	15.45
64	Ghana.....	3.98	49.72	130	Venezuela, Bolivarian Rep.....	2.68	14.79
65	Zambia.....	3.96	49.18	131	El Salvador.....	2.67	14.50
66	Slovenia.....	3.94	48.83	132	Angola.....	2.13	0.00

SOURCE: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

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6.2.1 Innovation output

Innovation Output Sub-Index | 2019

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	63.50	100.00	67	South Africa.....	22.30	27.85
2	Netherlands.....	57.50	89.49	68	Jamaica.....	22.10	27.50
3	Sweden.....	56.90	88.44	68	Jordan.....	22.10	27.50
4	United Kingdom.....	54.40	84.06	68	Qatar.....	22.10	27.50
5	China.....	52.80	81.26	71	Panama.....	21.90	27.15
6	United States of America.....	52.60	80.91	72	Tanzania, United Rep.	21.80	26.97
7	Finland.....	51.60	79.16	73	Argentina.....	21.60	26.62
7	Israel.....	51.60	79.16	73	Egypt.....	21.60	26.62
9	Germany.....	51.10	78.28	75	Colombia.....	20.90	25.39
10	Ireland.....	50.10	76.53	76	Indonesia.....	20.80	25.22
11	Luxembourg.....	49.20	74.96	76	Sri Lanka.....	20.80	25.22
12	Denmark.....	47.50	71.98	78	Bosnia and Herzegovina.....	20.40	24.52
13	Korea, Rep.....	47.20	71.45	79	Ethiopia.....	20.10	23.99
14	France.....	45.00	67.60	79	Senegal.....	20.10	23.99
15	Singapore.....	44.60	66.90	81	Cambodia.....	19.70	23.29
16	Japan.....	44.30	66.37	81	Tajikistan.....	19.70	23.29
17	Iceland.....	44.00	65.85	83	Saudi Arabia.....	19.50	22.94
18	Estonia.....	43.80	65.50	84	Peru.....	19.40	22.77
19	Czech Republic.....	43.40	64.80	85	Bahrain.....	19.30	22.59
19	Malta.....	43.40	64.80	86	Dominican Republic.....	19.20	22.42
21	Canada.....	41.40	61.30	87	Pakistan.....	19.10	22.24
22	Cyprus.....	41.10	60.77	88	Azerbaijan.....	18.80	21.72
23	Belgium.....	39.60	58.14	89	Côte d'Ivoire.....	18.70	21.54
24	Austria.....	39.10	57.27	90	Albania.....	18.30	20.84
25	Hungary.....	38.70	56.57	90	Kazakhstan.....	18.30	20.84
26	Norway.....	38.50	56.22	92	Paraguay.....	18.20	20.67
27	Spain.....	38.40	56.04	93	Mauritius.....	18.00	20.32
28	Italy.....	37.90	55.17	94	Ecuador.....	17.70	19.79
29	Slovenia.....	36.40	52.54	94	Ghana.....	17.70	19.79
30	Australia.....	36.30	52.36	96	Trinidad and Tobago.....	17.50	19.44
31	New Zealand.....	36.00	51.84	97	Mali.....	17.30	19.09
32	Slovakia.....	35.60	51.14	98	Oman.....	16.90	18.39
33	Latvia.....	35.20	50.44	99	Guatemala.....	16.80	18.21
34	Portugal.....	34.60	49.39	100	Namibia.....	16.70	18.04
35	Ukraine.....	34.10	48.51	101	Honduras.....	16.50	17.69
36	Viet Nam.....	33.90	48.16	102	Nigeria.....	16.40	17.51
37	Bulgaria.....	32.60	45.88	103	Cameroon.....	16.10	16.99
38	Malaysia.....	32.40	45.53	104	Bangladesh.....	15.50	15.94
39	Lithuania.....	32.30	45.36	104	Madagascar.....	15.50	15.94
40	Poland.....	31.70	44.31	104	Uganda.....	15.50	15.94
41	Philippines.....	30.70	42.56	107	Zimbabwe.....	15.40	15.76
41	Thailand.....	30.70	42.56	108	Kyrgyzstan.....	15.30	15.59
43	Moldova, Rep.....	30.30	41.86	108	Malawi.....	15.30	15.59
43	Mongolia.....	30.30	41.86	110	Bolivia, Plurinational St.....	15.10	15.24
45	Montenegro.....	30.00	41.33	111	Mozambique.....	14.80	14.71
46	Iran, Islamic Rep.....	29.90	41.16	112	Burkina Faso.....	14.30	13.84
47	Costa Rica.....	29.30	40.11	113	El Salvador.....	14.20	13.66
48	Armenia.....	28.60	38.88	114	Botswana.....	14.00	13.31
48	Turkey.....	28.60	38.88	115	Algeria.....	13.30	12.08
50	India.....	28.50	38.70	116	Brunei Darussalam.....	13.00	11.56
51	Croatia.....	28.30	38.35	116	Nepal.....	13.00	11.56
52	Romania.....	28.00	37.83	118	Zambia.....	12.70	11.03
53	Greece.....	27.60	37.13	119	Nicaragua.....	12.10	9.98
54	Mexico.....	27.40	36.78	120	Rwanda.....	11.30	8.58
55	Kuwait.....	27.20	36.43	121	Burundi.....	8.80	4.20
56	Serbia.....	26.90	35.90	122	Yemen.....	6.40	0.00
57	United Arab Emirates.....	26.70	35.55		Angola.....	n/a	n/a
58	Russian Federation.....	26.10	34.50		Bhutan.....	n/a	n/a
59	Georgia.....	25.80	33.98		Cabo Verde.....	n/a	n/a
60	Uruguay.....	25.30	33.10		Congo, Dem. Rep.....	n/a	n/a
61	Chile.....	25.00	32.57		Eswatini.....	n/a	n/a
62	North Macedonia.....	24.90	32.40		Gambia.....	n/a	n/a
63	Kenya.....	24.20	31.17		Lao PDR.....	n/a	n/a
64	Tunisia.....	23.50	29.95		Lesotho.....	n/a	n/a
65	Morocco.....	23.30	29.60		Liberia.....	n/a	n/a
66	Brazil.....	22.90	28.90		Venezuela, Bolivarian Rep.....	n/a	n/a

SOURCE: INSEAD, Cornell University, and World Intellectual Property Organization, *The Global Innovation Index 2019* (<https://www.globalinnovationindex.org>)
For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

6.2.2 High-value exports

High technology manufactures (%) | 2017

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Lao PDR.....	33.58	100.00	67	Tunisia.....	5.24	15.58
1	Philippines.....	57.77	100.00	68	Burkina Faso.....	5.18	15.42
1	Singapore.....	49.17	100.00	69	Moldova, Rep.....	5.15	15.32
4	Brunei Darussalam.....	29.90	89.03	70	Guatemala.....	5.06	15.05
5	Viet Nam.....	29.49	87.82	71	El Salvador.....	5.04	15.00
6	Malaysia.....	28.15	83.82	72	Ukraine.....	4.98	14.82
7	China.....	23.81	70.91	73	Bolivia, Plurinational St.....	4.86	14.46
8	France.....	23.55	70.11	74	Yemen.....	4.70	13.98
9	Kazakhstan.....	22.70	67.60	75	Cameroon.....	4.67	13.89
10	Thailand.....	21.51	64.06	76	Peru.....	4.66	13.86
11	Malta.....	21.47	63.94	77	Ecuador.....	4.65	13.85
12	United Kingdom.....	20.71	61.67	78	South Africa.....	4.64	13.82
13	Ireland.....	19.17	57.09	79	Côte d'Ivoire.....	4.57	13.61
14	Netherlands.....	18.58	55.32	80	Portugal.....	4.25	12.65
15	Latvia.....	18.52	55.16	81	Kuwait.....	4.20	12.50
16	Norway.....	18.43	54.89	82	North Macedonia.....	3.69	10.98
17	Ethiopia.....	17.24	51.35	83	Morocco.....	3.62	10.76
18	Mexico.....	16.01	47.66	84	Mongolia.....	3.20	9.53
19	Estonia.....	15.77	46.95	85	Kenya.....	3.15	9.38
20	Korea, Rep.....	14.18	42.23	86	Honduras.....	3.02	8.98
21	Germany.....	13.90	41.40	87	Georgia.....	2.97	8.84
22	Israel.....	13.84	41.22	88	Bosnia and Herzegovina.....	2.93	8.71
23	United States of America.....	13.82	41.15	89	Saudi Arabia.....	2.82	8.40
24	Japan.....	13.81	41.11	90	Montenegro.....	2.54	7.55
25	Hungary.....	13.80	41.08	91	Turkey.....	2.53	7.53
26	Czech Republic.....	13.34	39.73	92	Tanzania, United Rep.....	2.37	7.04
27	Canada.....	12.85	38.27	93	United Arab Emirates.....	2.32	6.90
28	Australia.....	12.79	38.09	94	Mauritius.....	2.23	6.64
29	Cyprus.....	12.73	37.91	95	Qatar.....	2.20	6.54
30	Sweden.....	12.48	37.16	96	Pakistan.....	2.13	6.34
31	Brazil.....	12.28	36.57	97	Zimbabwe.....	2.01	5.98
32	Rwanda.....	12.28	36.57	98	Zambia.....	1.97	5.86
33	Russian Federation.....	11.52	34.31	99	Azerbaijan.....	1.95	5.81
34	Lithuania.....	11.51	34.28	100	Nigeria.....	1.90	5.65
35	Denmark.....	11.24	33.47	101	Jordan.....	1.80	5.36
36	Malawi.....	11.13	33.15	102	Uganda.....	1.79	5.32
37	Switzerland.....	10.99	32.73	103	Burundi.....	1.46	4.33
38	Slovakia.....	10.93	32.55	104	Iran, Islamic Rep.....	1.31	3.91
39	Greece.....	10.83	32.25	105	Namibia.....	1.24	3.68
40	Iceland.....	10.75	32.00	106	Nepal.....	1.16	3.43
41	Austria.....	9.78	29.13	107	Venezuela, Bolivarian Rep.....	1.13	3.36
42	Paraguay.....	9.64	28.70	108	Oman.....	1.12	3.32
43	Belgium.....	9.49	28.24	109	Senegal.....	1.10	3.27
44	Romania.....	9.27	27.59	110	Bahrain.....	1.05	3.11
45	Argentina.....	8.95	26.65	111	Mali.....	0.89	2.65
46	New Zealand.....	8.77	26.12	112	Sri Lanka.....	0.89	2.64
47	Kyrgyzstan.....	8.71	25.92	113	Botswana.....	0.89	2.64
48	Colombia.....	8.69	25.87	114	Egypt.....	0.87	2.57
49	Ghana.....	8.13	24.22	115	Algeria.....	0.54	1.61
50	Poland.....	7.74	23.03	116	Madagascar.....	0.54	1.60
51	Dominican Republic.....	7.73	23.00	117	Nicaragua.....	0.54	1.59
52	Bulgaria.....	7.58	22.56	118	Jamaica.....	0.45	1.33
53	Croatia.....	7.45	22.18	119	Cambodia.....	0.43	1.28
54	Uruguay.....	7.42	22.10	120	Bangladesh.....	0.30	0.88
55	Costa Rica.....	7.41	22.05	121	Eswatini.....	0.29	0.85
56	Finland.....	7.32	21.79	122	Lesotho.....	0.19	0.57
57	Spain.....	7.05	20.97	123	Trinidad and Tobago.....	0.13	0.37
58	India.....	7.01	20.87	124	Albania.....	0.09	0.25
59	Italy.....	6.84	20.38	125	Gambia.....	0.08	0.23
60	Luxembourg.....	6.71	19.99	126	Bhutan.....	0.02	0.06
61	Armenia.....	6.47	19.27	127	Cabo Verde.....	0.00	0.00
62	Slovenia.....	6.32	18.82		Angola.....	n/a	n/a
63	Chile.....	6.13	18.24		Congo, Dem. Rep.....	n/a	n/a
64	Panama.....	5.73	17.04		Liberia.....	n/a	n/a
65	Indonesia.....	5.69	16.93		Serbia.....	n/a	n/a
66	Mozambique.....	5.64	16.79		Tajikistan.....	n/a	n/a

SOURCE: World Bank, World Development Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>). The classification of exports is based on Lall, S. (2000), The Technological Structure and Performance of Developing Country Manufactured Exports, *Oxford Development Studies*, 28(3), 1985–1989
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6.2.3 New product entrepreneurial activity

New product entrepreneurial activity (%) | 2018

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Luxembourg	47.94	100.00	67	Colombia	16.07	27.94
2	Chile	47.58	99.19	68	Trinidad and Tobago	15.96	27.70
3	India	46.88	97.60	69	Cameroon	15.90	27.56
4	Denmark	46.34	96.38	70	North Macedonia	15.50	26.66
5	Canada	41.30	84.99	71	Indonesia	15.36	26.34
6	Namibia	40.08	82.23	72	El Salvador	14.90	25.30
7	Belgium	39.72	81.42	73	Bulgaria	14.89	25.28
8	Guatemala	39.16	80.15	74	Morocco	14.88	25.25
9	Cyprus	38.63	78.95	75	Ghana	14.73	24.92
10	Austria	37.02	75.31	76	Norway	13.97	23.20
11	Ireland	35.75	72.44	77	Viet Nam	13.86	22.95
12	United States of America	33.99	68.46	78	Ethiopia	13.72	22.63
13	Sweden	33.71	67.83	79	Venezuela, Bolivarian Rep.	13.44	22.00
14	China	33.06	66.36	80	Madagascar	13.38	21.86
15	Israel	32.90	66.00	81	Poland	12.17	19.13
16	Argentina	32.17	64.35	82	Algeria	11.48	17.57
16	Tunisia	32.17	64.35	83	Bosnia and Herzegovina	10.93	16.32
18	Philippines	31.84	63.60	84	Panama	10.47	15.28
19	Mexico	31.71	63.31	85	Senegal	8.21	10.17
20	Switzerland	31.68	63.24	86	Russian Federation	8.09	9.90
21	Turkey	30.80	61.25	87	Zambia	7.86	9.38
22	Germany	30.53	60.64	88	Uganda	7.56	8.70
23	Estonia	30.20	59.89	89	Bangladesh	6.78	6.94
24	Romania	30.00	59.44	90	Brazil	3.71	0.00
25	Korea, Rep.	29.94	59.30		Albania	n/a	n/a
26	South Africa	29.66	58.67		Armenia	n/a	n/a
27	Lithuania	29.55	58.42		Azerbaijan	n/a	n/a
28	Finland	29.40	58.08		Bahrain	n/a	n/a
29	Malaysia	29.33	57.92		Bhutan	n/a	n/a
30	Australia	28.51	56.07		Brunei Darussalam	n/a	n/a
31	Pakistan	28.49	56.03		Burundi	n/a	n/a
32	Greece	28.44	55.91		Cabo Verde	n/a	n/a
33	Latvia	28.41	55.84		Cambodia	n/a	n/a
34	United Arab Emirates	28.24	55.46		Congo, Dem. Rep.	n/a	n/a
35	Malawi	28.21	55.39		Côte d'Ivoire	n/a	n/a
36	France	28.07	55.08		Dominican Republic	n/a	n/a
37	Bolivia, Plurinational St.	27.88	54.65		Eswatini	n/a	n/a
38	Japan	27.74	54.33		Gambia	n/a	n/a
39	Egypt	27.52	53.83		Honduras	n/a	n/a
40	Czech Republic	27.51	53.81		Iceland	n/a	n/a
41	Qatar	26.95	52.54		Kenya	n/a	n/a
42	Slovenia	25.54	49.36		Kuwait	n/a	n/a
43	Uruguay	25.28	48.77		Kyrgyzstan	n/a	n/a
44	Croatia	24.59	47.21		Lao PDR	n/a	n/a
45	Italy	24.27	46.48		Lesotho	n/a	n/a
46	Jordan	23.90	45.65		Liberia	n/a	n/a
47	Netherlands	23.83	45.49		Mali	n/a	n/a
48	Kazakhstan	23.54	44.83		Malta	n/a	n/a
49	Saudi Arabia	23.26	44.20		Mauritius	n/a	n/a
50	Costa Rica	23.18	44.02		Moldova, Rep.	n/a	n/a
51	Burkina Faso	22.50	42.48		Mongolia	n/a	n/a
52	Spain	22.33	42.10		Montenegro	n/a	n/a
53	Slovakia	21.96	41.26		Mozambique	n/a	n/a
54	Peru	21.90	41.13		Nepal	n/a	n/a
55	United Kingdom	21.63	40.52		New Zealand	n/a	n/a
56	Portugal	21.00	39.09		Nicaragua	n/a	n/a
57	Singapore	20.47	37.89		Oman	n/a	n/a
58	Hungary	20.40	37.73		Paraguay	n/a	n/a
59	Botswana	20.27	37.44		Rwanda	n/a	n/a
60	Georgia	20.10	37.06		Serbia	n/a	n/a
60	Jamaica	20.10	37.06		Sri Lanka	n/a	n/a
62	Nigeria	18.30	32.99		Tajikistan	n/a	n/a
63	Angola	17.80	31.86		Tanzania, United Rep.	n/a	n/a
63	Thailand	17.80	31.86		Ukraine	n/a	n/a
65	Iran, Islamic Rep.	17.23	30.57		Yemen	n/a	n/a
66	Ecuador	16.54	29.01		Zimbabwe	n/a	n/a

SOURCE: Global Entrepreneurship Research Association, Global Entrepreneurship Monitor database (www.gemconsortium.org/data)

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6.2.4 New business density

New corporate registrations (per 1,000 working-age population) | 2016

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Estonia	20.76	100.00	67	Bosnia and Herzegovina	1.13	5.41
2	Botswana	18.37	88.46	68	Zambia	1.12	5.34
3	Malta	17.89	86.17	69	Namibia	1.09	5.19
4	Cyprus	16.56	79.75	70	Azerbaijan	1.03	4.92
5	United Kingdom	15.74	75.81	71	Thailand	0.99	4.73
6	Australia	15.51	74.69	72	Nepal	0.98	4.67
7	Luxembourg	15.35	73.91	73	Ghana	0.90	4.27
8	New Zealand	14.50	69.81	74	Kenya	0.84	4.02
9	Iceland	12.14	58.47	75	Panama	0.84	3.98
10	Bulgaria	10.89	52.42	76	Greece	0.77	3.64
11	South Africa	10.22	49.20	77	Nigeria	0.76	3.62
12	Denmark	9.91	47.73	78	Uganda	0.70	3.32
13	Mauritius	9.78	47.08	79	Jordan	0.60	2.84
14	Chile	8.93	42.96	80	Austria	0.60	2.82
15	Singapore	8.62	41.51	81	Algeria	0.58	2.74
16	Georgia	8.37	40.29	82	Bolivia, Plurinational St.	0.54	2.56
17	Norway	8.15	39.23	83	Guatemala	0.54	2.55
18	Sweden	8.09	38.95	84	Mexico	0.54	2.54
19	Latvia	8.04	38.68	85	El Salvador	0.53	2.52
20	Ireland	6.71	32.31	86	Sri Lanka	0.51	2.43
21	Montenegro	6.70	32.25	87	Saudi Arabia	0.44	2.07
22	Mongolia	6.31	30.34	88	Argentina	0.43	2.03
23	Netherlands	6.07	29.22	89	Senegal	0.42	1.96
24	Romania	5.61	26.97	90	Indonesia	0.33	1.56
25	Portugal	5.01	24.11	91	Philippines	0.33	1.55
26	Croatia	4.96	23.83	92	Lao PDR	0.30	1.39
27	Slovakia	4.70	22.62	93	Tajikistan	0.18	0.83
28	Russian Federation	4.34	20.88	94	Japan	0.15	0.69
29	Switzerland	4.31	20.71	95	Burkina Faso	0.15	0.67
30	Czech Republic	3.98	19.15	96	Paraguay	0.14	0.65
31	Finland	3.95	18.98	97	Brazil	0.13	0.57
32	North Macedonia	3.88	18.64	98	India	0.11	0.47
33	Belgium	3.72	17.88	99	Bangladesh	0.09	0.39
34	Peru	3.63	17.45	100	Bhutan	0.09	0.37
35	Israel	3.44	16.51	101	Malawi	0.08	0.35
36	Hungary	3.38	16.25	102	Madagascar	0.07	0.30
37	Lithuania	3.33	15.99	103	Canada	0.06	0.26
38	Spain	3.23	15.51	104	Pakistan	0.06	0.24
39	Slovenia	3.13	15.04	105	Congo, Dem. Rep.	0.04	0.14
40	Italy	2.65	12.71	106	Ethiopia	0.03	0.10
41	United Arab Emirates	2.62	12.60	107	Liberia	0.01	0.00
42	Korea, Rep.	2.58	12.39		Angola	n/a	n/a
43	Brunei Darussalam	2.48	11.90		Bahrain	n/a	n/a
44	Colombia	2.28	10.94		Burundi	n/a	n/a
45	Malaysia	2.26	10.85		Cabo Verde	n/a	n/a
46	Kazakhstan	2.24	10.77		Cambodia	n/a	n/a
47	Oman	2.11	10.12		Cameroon	n/a	n/a
48	Costa Rica	2.10	10.08		China	n/a	n/a
49	Uruguay	2.07	9.91		Côte d'Ivoire	n/a	n/a
50	Rwanda	1.95	9.33		Ecuador	n/a	n/a
51	France	1.84	8.80		Egypt	n/a	n/a
52	Serbia	1.76	8.44		Eswatini	n/a	n/a
53	Moldova, Rep.	1.75	8.41		Gambia	n/a	n/a
54	Armenia	1.74	8.32		Honduras	n/a	n/a
55	Qatar	1.70	8.14		Iran, Islamic Rep.	n/a	n/a
56	Tunisia	1.67	8.02		Kuwait	n/a	n/a
57	Poland	1.66	7.97		Mali	n/a	n/a
58	Morocco	1.65	7.92		Mozambique	n/a	n/a
59	Lesotho	1.55	7.41		Nicaragua	n/a	n/a
60	Ukraine	1.54	7.39		Tanzania, United Rep.	n/a	n/a
61	Dominican Republic	1.48	7.07		Trinidad and Tobago	n/a	n/a
62	Albania	1.35	6.47		United States of America	n/a	n/a
63	Jamaica	1.31	6.25		Venezuela, Bolivarian Rep.	n/a	n/a
64	Germany	1.30	6.23		Viet Nam	n/a	n/a
65	Kyrgyzstan	1.27	6.08		Yemen	n/a	n/a
66	Turkey	1.18	5.63		Zimbabwe	n/a	n/a

SOURCE: World Bank, Doing Business, Entrepreneurship Project (<http://www.doingbusiness.org/en/data/exploretopics/entrepreneurship>)

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

6.2.5 Scientific journal articles

Number of scientific and technical journal articles (per 10,000 inhabitants) | 2016

Rank	Country	Value	Score	Rank	Country	Value	Score
1	Switzerland.....	25.23	100.00	67	Trinidad and Tobago.....	1.34	5.29
2	Denmark.....	23.52	93.20	68	Colombia.....	1.27	5.00
3	Australia.....	21.11	83.66	69	Mauritius.....	1.23	4.85
4	Norway.....	20.49	81.20	70	Mexico.....	1.18	4.63
5	Sweden.....	20.09	79.62	71	Morocco.....	1.16	4.55
6	Singapore.....	20.07	79.53	72	Egypt.....	1.14	4.50
7	Iceland.....	19.43	77.00	73	Algeria.....	1.10	4.31
8	Finland.....	19.19	76.04	74	Botswana.....	1.05	4.12
9	Netherlands.....	17.59	69.68	75	Kazakhstan.....	0.88	3.44
10	Slovenia.....	16.50	65.37	76	India.....	0.83	3.26
11	New Zealand.....	15.91	63.02	77	Moldova, Rep.....	0.83	3.26
12	Canada.....	15.88	62.94	78	Costa Rica.....	0.77	3.01
13	Czech Republic.....	15.11	59.86	79	Albania.....	0.67	2.60
14	United Kingdom.....	14.87	58.91	80	Ecuador.....	0.66	2.59
15	Belgium.....	14.47	57.32	81	Bhutan.....	0.55	2.12
16	Ireland.....	14.37	56.94	82	Azerbaijan.....	0.49	1.91
17	Austria.....	14.15	56.08	83	Sri Lanka.....	0.49	1.89
18	Luxembourg.....	14.05	55.68	84	Jamaica.....	0.46	1.80
19	Israel.....	13.92	55.13	85	Namibia.....	0.46	1.77
20	Portugal.....	13.34	52.85	86	Pakistan.....	0.45	1.75
21	United States of America.....	12.66	50.15	87	Panama.....	0.39	1.52
22	Germany.....	12.52	49.61	88	Mongolia.....	0.37	1.42
23	Korea, Rep.....	12.31	48.75	89	Ghana.....	0.34	1.33
24	Italy.....	11.40	45.17	90	Peru.....	0.33	1.25
25	Spain.....	11.36	45.01	91	Viet Nam.....	0.32	1.21
26	Estonia.....	11.26	44.61	92	Indonesia.....	0.30	1.13
27	France.....	10.38	41.13	93	Venezuela, Bolivarian Rep.....	0.29	1.10
28	Greece.....	9.95	39.42	94	Cameroon.....	0.28	1.07
29	Slovakia.....	9.87	39.09	95	Eswatini.....	0.28	1.06
30	Croatia.....	9.72	38.48	96	Senegal.....	0.24	0.89
31	Poland.....	8.69	34.39	97	Gambia.....	0.22	0.82
32	Cyprus.....	8.31	32.92	98	Zimbabwe.....	0.21	0.80
33	Lithuania.....	7.60	30.11	99	Nigeria.....	0.21	0.77
34	Japan.....	7.60	30.10	100	Nepal.....	0.20	0.76
35	Serbia.....	7.16	28.34	101	Kenya.....	0.20	0.76
36	Malta.....	7.04	27.86	102	Kyrgyzstan.....	0.17	0.62
37	Malaysia.....	6.63	26.23	103	Bangladesh.....	0.16	0.60
38	Latvia.....	6.41	25.39	104	Cabo Verde.....	0.15	0.56
39	Hungary.....	6.33	25.04	105	Philippines.....	0.15	0.56
40	Romania.....	5.17	20.47	106	Uganda.....	0.14	0.53
41	Brunei Darussalam.....	5.17	20.44	107	Paraguay.....	0.14	0.52
42	Iran, Islamic Rep.....	5.15	20.38	108	Lao PDR.....	0.12	0.45
43	Qatar.....	4.94	19.54	109	Burkina Faso.....	0.12	0.43
44	Tunisia.....	4.66	18.43	110	Malawi.....	0.12	0.43
45	Turkey.....	4.25	16.80	111	Lesotho.....	0.11	0.40
46	Montenegro.....	4.14	16.38	112	Zambia.....	0.11	0.39
47	Russian Federation.....	4.10	16.20	113	Ethiopia.....	0.11	0.39
48	Chile.....	3.70	14.65	114	Tanzania, United Rep.....	0.10	0.36
49	Bulgaria.....	3.59	14.19	115	Rwanda.....	0.10	0.35
50	China.....	3.09	12.22	116	Bolivia, Plurinational St.....	0.09	0.30
51	Saudi Arabia.....	2.85	11.24	117	Côte d'Ivoire.....	0.07	0.25
52	Brazil.....	2.60	10.27	118	Cambodia.....	0.07	0.25
53	Uruguay.....	2.36	9.33	119	Nicaragua.....	0.06	0.18
54	United Arab Emirates.....	2.33	9.20	120	Tajikistan.....	0.05	0.18
55	North Macedonia.....	2.32	9.16	121	Guatemala.....	0.05	0.16
56	South Africa.....	2.11	8.34	122	Mali.....	0.05	0.15
57	Argentina.....	1.98	7.83	123	El Salvador.....	0.04	0.14
58	Kuwait.....	1.87	7.36	124	Madagascar.....	0.04	0.12
59	Oman.....	1.77	7.00	125	Yemen.....	0.04	0.12
60	Armenia.....	1.77	6.99	126	Liberia.....	0.04	0.10
61	Jordan.....	1.73	6.82	127	Mozambique.....	0.04	0.10
62	Ukraine.....	1.64	6.46	128	Honduras.....	0.04	0.10
63	Georgia.....	1.55	6.12	129	Dominican Republic.....	0.03	0.07
64	Bosnia and Herzegovina.....	1.50	5.91	130	Congo, Dem. Rep.....	0.01	0.02
65	Bahrain.....	1.48	5.82	131	Angola.....	0.01	0.01
66	Thailand.....	1.39	5.47	132	Burundi.....	0.01	0.00

SOURCE: World Bank, World Development Indicators based on National Science Foundation, Science and Engineering Indicators; population data come from World Bank, World Development Indicators

For some countries, the latest year for which data are available may differ from the year that appears at the top of the page. The cut-off year is 2008.

Appendices

Appendix I

Technical Notes

Technical Notes

Audit by the Joint Research Centre of the European Commission

The Joint Research Centre (JRC) of the European Commission has conducted extensive research on the development of composite indicators, most notably publishing the *Handbook on Constructing Composite Indicators: Methodology and User Guide* in collaboration with the Organisation for Economic Co-operation and Development (OECD). For the seventh consecutive edition of the Global Talent Competitiveness Index (GTCI), the GTCI development team engaged the JRC to conduct an audit.¹ This exercise has provided external validation and further improved the statistical analyses to ensure the consistency and rigour of the GTCI model.

In July 2019, an earlier version of the index model for the GTCI 2020 was submitted to the JRC team. The results from the preliminary audit were taken into account and are reflected in the final version of the index model, as appropriate. The final audit was then completed in October 2019 based on the latest model, the results of which can be found in Chapter 6.

Composite Indicators

The GTCI framework builds on six pillars: (1) Enable, (2) Attract, (3) Grow, (4) Retain, (5) Vocational and Technical Skills, and (6) Global Knowledge Skills. Each pillar consists of two to three sub-pillars. Each sub-pillar is composed of three to six variables. Each sub-pillar score is derived from the simple arithmetic average of its individual variables. The successive arithmetic aggregation continues at the pillar level.

Overall, the GTCI includes three indices:

- The Talent Competitiveness Input sub-index is the simple average of the first four pillars.
- The Talent Competitiveness Output sub-index is the simple average of the last two pillars.
- The Global Talent Competitiveness Index is the simple average of the six pillars.

Individual Variables

The GTCI 2020 model includes 70 variables, which fall within the following categories:²

1. Hard/quantitative data (27 variables)
2. Index/composite indicator data (14 variables)
3. Survey/qualitative data (29 variables)

Hard Data

The 27 variables based on hard data were drawn from a variety of public sources, such as the United Nations Educational,

Scientific and Cultural Organization (UNESCO), the United Nations Conference on Trade and Development (UNCTAD), the International Labour Organization (ILO), the World Bank, the OECD, and The Conference Board. Most variables were already scaled at their source and therefore did not need to be re-scaled.

Indices

The 14 variables measured as indices come from sources such as the World Bank (the World Governance Indicators and the *Doing Business* report series), the International Telecommunication Union, and Transparency International. They also come from other composite indicators such as the Social Progress Index, the Global Innovation Index (Cornell, INSEAD, and the World Intellectual Property Organization), and the Environmental Performance Index (Yale University and Columbia University). There are two main concerns about using 'indices within an index': (1) doubts over its methodology to derive a single score; and (2) the risk of duplicating variables. Despite these concerns, the GTCI team determined that the gains outweighed the downsides, as there are certain phenomena that are best captured by a multi-dimensional index. To address these concerns, only indices that transparently indicate their methodology and are widely well received were included in the GTCI. Additionally, to avoid double-counting, only indices with a narrow focus were selected.

Survey Data

The 29 variables based on survey data were mainly extracted from the World Economic Forum's Executive Opinion Survey. Qualitative information tends to provide the most current assessment of certain areas related to talent competitiveness for which hard data either do not exist or have low country coverage.

Country Coverage and Missing Data

The 132 countries covered in the GTCI 2020 were selected based on an aggregate data availability threshold of at least 80% (56 out of 70 variables) and a sub-pillar level data availability threshold of at least 40%. The most recent data points for each country were considered in the calculation, with 2008 as the cut-off year. Meanwhile, each variable had to pass a country-based availability threshold of 50% (66 out of 132 countries). In order to provide transparency and replicability, there was no imputation effort to fill in missing values in the data set. Missing values were noted with 'n/a' and were not considered in the calculation of sub-pillar scores.

Treatment of Series with Outliers

Inclusion of series with outliers can be problematic and potentially bias the rankings. Outliers were detected based on an absolute value of skewness greater than 2 and kurtosis greater than 3.5.³ In our data set, there were six variables with outliers.⁴ As a general rule, for variables with one to four outliers, the Winsorisation method should be applied. The values distorting the variable distribution were assigned the next highest value until the reported skewness and/or kurtosis fell within the ranges specified above. For variables with five outliers and above, transformation by natural logarithms, with the following formula, was used:⁵

$$\ln \left[(\max \times \text{factor} - 1) \times \frac{(\text{value} - \min)}{(\max - \min)} + 1 \right]$$

Normalisation

To adjust for differences in units of measurement and ranges of variation, all 70 variables were normalised into the [0, 100] range, with higher scores representing better outcomes. A min-max normalisation method was adopted, given the minimum and maximum values of each variable respectively.

For variables where higher values indicate higher outcomes, the following normalisation formula was applied:

$$100 \times \frac{(\text{value} - \min)}{(\max - \min)}$$

For variables where higher values indicate worse outcomes, the following reverse normalisation formula was applied:⁶

$$100 \times \frac{(\max - \text{value})}{(\max - \min)}$$

ENDNOTES

- 1 The JRC has audited various index projects, including the Global Innovation Index (Cornell, INSEAD, and WIPO), the Environment Performance Index (Yale and Columbia), and the Corruption Perceptions Index (Transparency international).
- 2 The GTCI 2019 had 68 variables in total, 25 of which were hard/quantitative data, 15 were index/composite indicators, and 28 were survey/qualitative data.
- 3 Adopted from Groeneveld & Meeden (1984).
- 4 The six indicators are: 1.3.8 Robot density; 2.1.3 Migrant stock; 2.1.4 International students; 2.2.5 Gender development gap, 6.1.5 Senior officials and managers, and 6.2.2 High-value exports.
- 5 The formula ensures that natural logarithms are positive and start at zero. Transformation by natural logarithms was needed in the case of indicator 2.1.3 Migrant stock. For the other five variables, Winsorisation was sufficient to treat the outliers.
- 6 Reverse normalisation was needed for two indicators: 1.3.1 Tertiary-educated unemployment and 2.2.1 Tolerance of minorities.

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Appendix II

Sources and Definitions

Sources and Definitions

1 ENABLE

1.1 Regulatory Landscape

1.1.1 Government effectiveness

Government effectiveness indicator | 2017

The government effectiveness indicator captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Scores are standardised.

Source: World Bank, *Worldwide Governance Indicators* 2018
Update (www.govindicators.org)

1.1.2 Rule of law

Rule of law indicator | 2017

The rule of law indicator 'reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. Scores are standardised.

Source: World Bank, *Worldwide Governance Indicators* 2018
Update (www.govindicators.org)

1.1.3 Political stability

Political stability and absence of violence indicator | 2017

The political stability and absence of violence indicator measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Scores are standardised.

Source: World Bank, *Worldwide Governance Indicators* 2018
Update (www.govindicators.org)

1.1.4 Regulatory quality

Regulatory quality indicator | 2017

The regulatory quality indicator captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Scores are standardised.

Source: World Bank, *Worldwide Governance Indicators* 2018
Update (www.govindicators.org)

1.1.5 Corruption

Corruption Perceptions Index | 2018

The Corruption Perceptions Index aggregates data from a number of different sources that provide perceptions of business people and country experts of the level of corruption in the public sector.

Source: Transparency International, *The Corruption Perceptions Index 2018* (<http://www.transparency.org/research/cpi>)

1.2 Market Landscape

1.2.1 Competition intensity

Average answer to the question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.2.2 Ease of doing business

Ease of doing business index | 2018

The ease of doing business index aggregates a country's percentile rankings on 10 topics covered in the World Bank's *Doing Business* report series. The topics are: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. A high ranking indicates that the regulatory environment is more conducive to setting up business.

Source: World Bank, *Doing Business 2019: Training for Reform* (<http://www.doingbusiness.org/en/reports/global-reports/doing-business-2019>)

1.2.3 Cluster development

Average answer to the question: In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)? [1 = nonexistent; 7 = widespread in many fields] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.2.4 R&D expenditure

Gross expenditure on R&D (%) | 2017

R&D expenditure refers to the total domestic intramural expenditure on research and development (R&D) during a given period as a percentage of GDP. Intramural R&D expenditure is all expenditure for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

1.2.5 ICT infrastructure

ICT access index | 2017

The ICT access index is a composite indicator that aggregates five ICT indicators (at 20% each): (1) Fixed-telephone subscriptions per 100 inhabitants, (2) Mobile-cellular telephone subscriptions per 100 inhabitants, (3) International internet bandwidth (bit/s) per internet user, (4) Percentage of households with a computer, and (5) Percentage of households with internet access. It is the first sub-index in ITU's ICT Development Index (IDI).

Source: International Telecommunication Union, *Measuring the Information Society Report 2017*, ICT Development Index 2017 (<http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx>)

1.2.6 Urban population

Population of urban areas (%) | 2018

Urban population refers to people living in urban areas as defined by national statistical offices. The data are collected and smoothed by the United Nations Population Division.

Source: United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2018 Revision* (<https://population.un.org/wup/>)

1.3 Business and Labour Landscape

Labour Market

1.3.1 Tertiary-educated unemployment

Unemployment rate with tertiary education (%) | 2018

This indicator refers to the percentage of the labour force with an advanced level of education who are unemployed. Advanced education comprises short-cycle tertiary education, a bachelor's degree or equivalent education level, a master's degree or equivalent education level, or a doctoral degree or equivalent education level according to the International Standard Classification of Education 2011 (ISCED 2011).

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

1.3.2 Active labour market policies

Average answer to the question: In your country, to what extent do labour market policies help unemployed people to reskill and find new employment (including skills matching, retraining, etc.)? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.3.3 Labour-employer cooperation

Average answer to the question: In your country, how do you characterize labor-employer relations? [1 = generally confrontational; 7 = generally cooperative] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

Management Practice

1.3.4 Professional management

Average answer to the question: In your country, who holds senior management positions in companies? [1 = usually relatives or friends without regard to merit; 7 = mostly professional managers chosen for merit and qualifications] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.3.5 Relationship of pay to productivity

Average answer to the question: In your country, to what extent is pay related to employee productivity? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

Technology Adoption

1.3.6 Technology utilisation

Average answer to the question: In your country, to what extent do businesses adopt the latest technologies? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.3.7 Investment in emerging technologies

Average answer to the question: In your country, to what extent do companies invest in emerging technologies (e.g. Internet of Things, advanced analytics and artificial intelligence, augmented virtual reality and wearables, advanced robotics, 3D printing)? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

1.3.8 Robot density

Number of robots in operation per 10,000 employees in the manufacturing industry | 2019

Robot density refers to the estimated number of multipurpose industrial robots per 10,000 persons employed in the manufacturing industry (ISIC rev.4: C). The International Federation of Robotics (IFR) collects country-level data on operational stock of industrial robots and, for some countries, computes robot densities. The computed robot densities are published in the annual *World Robotics* report.

Source: Data on robot density and operational stock of industrial robots for 2019 kindly provided by the International Federation of Robotics (<https://ifr.org>). Data on employment in manufacturing in the countries for which IFR has not computed robot densities are sourced from the International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

2 ATTRACT

2.1 External Openness

Attract Business

2.1.1 FDI and technology transfer

Average answer to the question: To what extent does foreign direct investment (FDI) bring new technology into your country? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

2.1.2 Prevalence of foreign ownership

Average answer to the question: In your country, how prevalent is foreign ownership of companies? [1 = extremely rare; 7 = extremely prevalent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

Attract People

2.1.3 Migrant stock

Adult migrant stock (%) | 2017

Adult migrant stock refers to the number of the migrant stock population above 25 years old as a percentage of the total population of the same age group.

Source: United Nations Population Division, Trends in International Migrant Stock: Migrants by Age and Sex (www.un.org/en/development/desa/population/migration/data/estimates2/estimates17.shtml)

2.1.4 International students

Tertiary inbound mobility ratio (%) | 2017

Tertiary inbound mobility ratio refers to the number of students from abroad studying in a given country as a percentage of the total tertiary enrolment in that country.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

2.1.5 Brain gain

Average answer to the question: To what extent does your country attract talented people from abroad? [1 = not at all; 7 = to a great extent—the country attracts the best and brightest from around the world] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

2.2 Internal Openness

Social Inclusion

2.2.1 Tolerance of minorities

Discrimination and violence against minorities | 2019

Tolerance of minorities is based on the Group Grievance indicator included in the *Fragile States Index* published by The Fund for Peace. Group Grievance 'focuses on divisions and schisms between different groups in society—particularly divisions based on social or political characteristics—and their role in access to services or resources, and inclusion in the political process'. Its dimensions include post-conflict response, equality, divisions, and communal violence. It is measured on a scale of 0 (low pressures) to 10 (very high pressures).

Source: The Fund for Peace, *Fragile States Index 2019* (<https://fragilestatesindex.org/>)

2.2.2 Tolerance of immigrants

The percentage of respondents answering 'Good place' to the question: Is the city or area where you live a good place or not a good place to live for immigrants from other countries? | 2018

The Gallup World Poll is an annual survey carried out in more than 140 countries. One of the topics included in the poll concerns social issues, where the question related to the Tolerance of immigrants indicator is one of four questions asked.

Source: The Gallup World Poll (2006–2018). Data kindly provided by Gallup, Inc. (<https://www.gallup.com/analytics/232838/world-poll.aspx>)

2.2.3 Social mobility

Average answer to the question: In your country, to what extent do individuals have the opportunity to improve their economic situation through their personal efforts regardless of the socio-economic status of their parents? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

Gender Equality

2.2.4 Female graduates

Female tertiary graduates (%) | 2018

Female tertiary graduates refers to the percentage of female graduates whose highest educational attainment is the tertiary level. The tertiary level is based on International Standard Classification of Education (ISCED) levels 5–8.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

2.2.5 Gender development gap

Gender Development Index | 2017

The *Gender Development Index* (GDI) refers to disparities between women and men in three basic dimensions of human development—health, knowledge, and living standards. Based on the same methodology and component indicators as the Human Development Index (HDI), the GDI is a direct measure of gender gap showing the female HDI as a percentage of the male HDI.

Source: United Nations Development Programme (UNDP), *Human Development Indices and Indicators: 2018 Statistical Update* (<http://hdr.undp.org/en/content/gender-development-index-gdi>)

2.2.6 Leadership opportunities for women

Average answer to the question: In your country, to what extent do companies provide women with the same opportunities as men to rise to positions of leadership? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3 GROW

3.1 Formal Education

Enrolment

3.1.1 Vocational enrolment

Vocational enrolment (%) | 2018

Vocational enrolment refers to the total number of students enrolled in vocational programmes in secondary education, expressed as a percentage of the total number of students enrolled in all programmes (vocational and general) at that level. The secondary level is based on International Standard Classification of Education (ISCED) levels 2–4.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

3.1.2 Tertiary enrolment

Tertiary enrolment (%) | 2018

Tertiary enrolment refers to the ratio of total tertiary enrolment, regardless of age, to the population of the age group that officially corresponds to the tertiary level of education. Tertiary education, whether or not to an advanced research qualification, normally requires as a minimum condition of admission the successful completion of education at the secondary level. The tertiary level is based on International Standard Classification of Education (ISCED) levels 5–8.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

Quality

3.1.3 Tertiary education expenditure

Government expenditure on tertiary education (%) | 2018

Government expenditure on tertiary education as a percentage of GDP. Tertiary education is based on International Standard Classification of Education (ISCED) levels 5–8.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

3.1.4 Reading, maths, and science

PISA average scores in reading, mathematics, and science | 2015

The OECD Programme for International Student Assessment (PISA) develops triennial surveys that examine 15-year-old students' performance in reading, mathematics, and science. The scores are calculated so that the mean is 500 and the standard deviation is 100. The scores for China come from Beijing-Shanghai-Jiangsu-Guangdong.

Source: OECD Programme for International Student Assessment (PISA) (www.oecd.org/pisa)

3.1.5 University ranking

QS World University Ranking | 2019

The QS World University Ranking is based on six indicators (with their weights in parentheses): (1) Academic reputation from global survey (40%), (2) Employer reputation from global survey (10%), (3) Citations per faculty from Elsevier's *Scopus* database (20%), (4) Faculty-student ratio (20%), (5) Proportion of international students (5%), and (6) Proportion of international faculty (5%). The value is derived from the average score of the top three universities per country. A country without any university in the ranking is given a score of 0.

Source: Quacquarelli Symonds Ltd (QS), QS World University Ranking 2020, Top Universities (www.topuniversities.com/university-rankings/world-university-rankings)

3.2 Lifelong Learning

3.2.1 Quality of management schools

Average answer to the question: In your country, how do you assess the quality of business schools? [1 = extremely poor—among the worst in the world; 7 = excellent—among the best in the world] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3.2.2 Prevalence of training in firms

Proportion of firms offering formal training (%) | 2019

The Enterprise Survey is a firm-level survey of a representative sample of an economy's private sector. The survey covers a broad range of business environment topics including access to finance, corruption, infrastructure, crime, competition, and performance measures. Since 2005–06, under its developed Global Methodology, the World Bank's Enterprise Analysis Unit has collected these data based on over 135,000 interviews with top managers and business owners in 139 economies.

Source: World Bank, Enterprise Surveys (www.enterprisesurveys.org)

3.2.3 Employee development

Average answer to the question: In your country, to what extent do companies invest in training and employee development? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement the *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3.3 Access to Growth Opportunities

Empowerment

3.3.1 Delegation of authority

Average answer to the question: In your country, to what extent does senior management delegate authority to subordinates? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3.3.2 Personal rights

Personal rights indicator | 2019

Personal Rights are a component in the Opportunity dimension of the Social Progress Index. This component is based on four variables: Political rights, Freedom of expression, Freedom of religion, Access to justice, and Property rights for women.

Source: Social Progress Imperative, The Social Progress Index 2019 (<https://www.socialprogress.org/>)

Collaboration

3.3.3 Use of virtual social networks

Average answer to the question: In your country, how widely are virtual social networks used (e.g., Facebook, Twitter, LinkedIn)? [1 = not at all used; 7 = used extensively] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3.3.4 Use of virtual professional networks

LinkedIn users (per 1,000 labour force) | 2018

LinkedIn users refers to the number of registered LinkedIn accounts per 1,000 labour force (15–64 years old).

Source: Data on LinkedIn users kindly provided by LinkedIn. Data on labour force are sourced from the International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

3.3.5 Collaboration within organisations

Average answer to the question: In your country, to what extent do people collaborate and share ideas within a company? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

3.3.6 Collaboration across organisations

Average answer to the question: In your country, to what extent do companies collaborate in sharing ideas and innovating? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

4 RETAIN

4.1 Sustainability

4.1.1 Pension system

Workforce contributing to pension system (%) | 2015

Pension system refers to old-age effective coverage in terms of contributors. It is reported as the percentage of people who are 15 years old or above who contribute to a pension scheme.

Source: International Labour Organization, *World Social Protection Report 2017–19* (<https://www.social-protection.org>)

4.1.2 Social protection

Average answer to the question: In your country, to what extent does a formal social safety net provide protection to the general population from economic insecurity in the event of job loss or disability? [1 = not at all; 7 = provides full protection] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

4.1.3 Brain retention

Average answer to the question: To what extent does your country retain talented people? [1 = not at all—the best and brightest leave to pursue opportunities abroad; 7 = to a great extent—the best and brightest stay and pursue opportunities in the country] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

4.2 Lifestyle

4.2.1 Environmental performance

Environmental Performance Index | 2018

The Environmental Performance Index (EPI) ranks how well countries perform in two fundamental dimensions of sustainable development: environmental health and ecosystem vitality. Indicators in the EPI measure how close countries are to meeting internationally established targets or, in the absence of agreed-upon targets, how they compare relative to the best-performing countries.

Source: Wendling, Z. A., Emerson, J. W., Esty, D. C., Levy, M. A., de Sherbinin, A., et al. (2018). *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy (<https://epi.envirocenter.yale.edu/>)

4.2.2 Personal safety

Personal safety indicator | 2019

Personal safety is a component in the Basic Human Needs dimension of the Social Progress Index. This component is based on four variables: Homicide rate, Perceived criminality, Political killings and torture, and Traffic deaths.

Source: Social Progress Imperative, The Social Progress Index 2019 (<https://www.socialprogress.org/>)

4.2.3 Physician density

Physicians (per 1,000 people) | 2016

Physician density refers to the number of medical doctors (physicians), including generalist and specialist medical practitioners, per 1,000 people.

Source: World Bank, World Development Indicators based on World Health Organization, Global Atlas of the Health Workforce; OECD; and country data (<http://data.worldbank.org/data-catalog/world-development-indicators>)

4.2.4 Sanitation

Population with access to improved sanitation facilities (%) | 2015

This indicator refers to the percentage of the population using at least basic sanitation services—that is, improved sanitation facilities that are not shared with other households. This indicator encompasses both people using basic sanitation services as well as those using safely managed sanitation services. Improved sanitation facilities include flush/pour-flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.

Source: World Bank, World Development Indicators based on WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene (<http://data.worldbank.org/data-catalog/world-development-indicators>)

5 VOCATIONAL AND TECHNICAL SKILLS

5.1 Mid-Level Skills

5.1.1 Workforce with secondary education

Labour force with secondary education (%) | 2018

Workforce with secondary education refers to the percentage of the labour force (above 15 years old) whose highest educational attainment is at the secondary level. Secondary level includes both upper secondary and post-secondary non-tertiary education based on International Standard Classification of Education (ISCED) levels 3–4.

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

5.1.2 Population with secondary education

Population with secondary education (%) | 2018

Population with secondary education refers to the percentage of the population (above 25 years old) whose highest educational attainment is at the secondary level. This is based on International Standard Classification of Education (ISCED) levels 3–4.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

5.1.3 Technicians and associate professionals

Technicians and associate professionals (%) | 2018

Technicians and associate professionals refers to the number of technicians and associate professionals as a share of the total workforce. The employment by occupation is based on the International Standard Classification of Occupation (ISCO) Revision 2008 (data based on ISCO Rev. 1988 is used for those countries where ISCO Rev. 2008 is not available). It includes physical and engineering science associate professionals, life science and health associate professionals, teaching associate professionals, and other associate professionals (finance and sales, social work, artistic, entertainment and sports, religious associate professionals, police inspectors and detectives, administrative, customs, and tax and related government associate professionals).

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

5.1.4 Labour productivity per employee

Labour productivity per person employed (2018 US\$) | 2019

The Conference Board provides two calculations of its estimates on output, labour, and labour productivity: an original version based on official GDP data and an adjusted version based on GDP growth and levels that take into account rapidly falling ICT prices. *Labour productivity per employee* is based on the estimates of the adjusted version.

Source: The Conference Board, Total Economy Database™ (Adjusted version) (www.conference-board.org/data/economydatabase)

5.2 Employability

5.2.1 Ease of finding skilled employees

Average answer to the question: In your country, to what extent can companies find people with the skills required to fill their vacancies? [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

5.2.2 Relevance of education system to the economy

Average answer to the question: In your country, how well does the education system meet the needs of a competitive economy? [1 = not well at all; 7 = extremely well] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

5.2.3 Skills matching with secondary education

Average answer to the question: In your country, to what extent do graduating students possess the skills needed by businesses at the following levels: a. Secondary education [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

5.2.4 Skills matching with tertiary education

Average answer to the question: In your country, to what extent do graduating students possess the skills needed by businesses at the following levels: b. University level [1 = not at all; 7 = to a great extent] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

6 GLOBAL KNOWLEDGE SKILLS

6.1 High-Level Skills

6.1.1 Workforce with tertiary education

Labour force with tertiary education (%) | 2018

Workforce with tertiary education refers to the percentage of the labour force (above 15 years old) whose highest educational attainment is at the tertiary level. The tertiary level is based on International Standard Classification of Education (ISCED) levels 5–8.

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

6.1.2 Population with tertiary education

Population with tertiary education (%) | 2017

Population with tertiary education refers to the percentage of the population (above 25 years old) whose highest educational attainment is at the tertiary level. The tertiary level is based on International Standard Classification of Education (ISCED) levels 5–8.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

6.1.3 Professionals

Professionals (%) | 2018

Professionals refers to the number of professionals as a share of the total workforce. The employment by occupation is based on the International Standard Classification of Occupation (ISCO) Revision 2008 (data based on ISCO Rev. 1988 is used for those countries where ISCO Rev. 2008 is not available). It includes physical, mathematical, and engineering science professionals; life science and health professionals; teaching professionals; and other professionals (business, legal, archivists, librarians, social science, religious professionals, writers, and creative or performing artists).

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

6.1.4 Researchers

Full-time equivalent researchers (per million population) | 2017

Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems, as well as the management of these projects. Full-time equivalence (FTE) R&D data are a measure of the actual volume of human resources devoted to R&D and are especially useful for international comparisons. 'One FTE may be thought of as one person-year. Thus, a person who normally spends 30% of time on R&D and the rest on other activities (such as teaching, university administration, and student counselling) should be considered as 0.3 FTE. Similarly, if a full-time R&D worker is employed at an R&D unit for only six months, this results in an FTE of 0.5.' The data are reported per million population.

Source: UNESCO Institute for Statistics, *UIS.Stat* (<http://data.uis.unesco.org/>)

6.1.5 Senior officials and managers

Legislators, senior officials, and managers (%) | 2018

This variable measures the percentage of legislators, senior officials, and managers within total employment. The employment by occupation is based on the International Standard Classification of Occupation (ISCO) Revision 2008 (data based on ISCO Rev. 1988 is used for those countries where ISCO Rev. 2008 is not available).

Source: International Labour Organization, *ILOSTAT* (<https://ilostat.ilo.org/>)

6.1.6 Availability of scientists and engineers

Average answer to the question: In your country, to what extent are scientists and engineers available? [1 = not at all; 7 = widely available] | 2018

The World Economic Forum's Executive Opinion Survey (EOS) is conducted on an annual basis to gather information from business leaders on topics for which hard data sources are scarce or nonexistent. It is part of the effort to supplement *The Global Competitiveness Report* in assessing issues that drive national competitiveness.

Source: World Economic Forum, Executive Opinion Survey 2017–2018 (<http://reports.weforum.org>)

6.2 Talent Impact

6.2.1 Innovation output

Innovation Output Sub-Index | 2019

The Global Innovation Index (GII), developed jointly by INSEAD and the World Intellectual Property Organization, aims to capture the richness of innovation in society. Innovation output is one of the two sub-indices in the GI, which is derived by aggregating two output pillars: Knowledge and Technology Outputs and Creative Outputs. The first pillar covers elements of knowledge creation, impact, and diffusion, while the second pillar includes creative intangibles, creative goods and services, and online creativity.

Source: INSEAD, Cornell University, and World Intellectual Property Organization, *The Global Innovation Index 2019* (<https://www.globalinnovationindex.org>)

6.2.2 High-value exports

High technology manufactures (%) | 2017

High-value exports here refers to high technology manufactures (electronic and electrical and other), as calculated according to the Lall classification, over exports of all manufactured goods.

Source: World Bank, World Development Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>). The classification of exports is based on Lall, S. (2000), *The Technological Structure and Performance of Developing Country Manufactured Exports*, *Oxford Development Studies* 28(3), 1985–1989

6.2.3 New product entrepreneurial activity

New product entrepreneurial activity (%) | 2018

New product entrepreneurial activity refers to the percentage of total early-stage entrepreneurs who indicate that their product or service is new to at least some customers AND that few/no other businesses offer the same product. The Global Entrepreneurship Monitor project is an annual assessment of the entrepreneurial activity, aspirations, and attitudes of individuals across a wide range of countries.

Source: Global Entrepreneurship Research Association, Global Entrepreneurship Monitor database (www.gemconsortium.org/data)

6.2.4 New business density

New corporate registrations (per 1,000 working-age population) | 2016

New business density is defined as the number of newly registered firms with limited liability per 1,000 working-age people (between 15 and 64 years old) per calendar year.

Source: World Bank, Doing Business, Entrepreneurship Project (<http://www.doingbusiness.org/en/data/exploretopics/entrepreneurship>)

6.2.5 Scientific journal articles

Number of scientific and technical journal articles (per 10,000 inhabitants) | 2016

Scientific and technical journal articles refers to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. The data are reported per 10,000 inhabitants.

Source: World Bank, World Development Indicators based on National Science Foundation, Science and Engineering Indicators; population data come from World Bank, World Development Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>)

Appendix III

About the Contributors
and Partners

About the Contributors



Dimitris Bertsimas

Dimitris Bertsimas is currently the Boeing Professor of Operations Research and the Associate Dean of Business Analytics at the Sloan School of Management at MIT. He received his SM and PhD in Applied Mathematics and Operations Research from MIT in 1987 and 1988, respectively. He has been

with the MIT faculty since 1988. His research interests include optimisation and machine learning and their applications in health care and transportation. He has co-authored more than 200 scientific papers and five graduate-level textbooks. He is the Editor-in-Chief of *INFORMS Journal of Optimization* and former department editor in Optimization for Management Science and in Financial Engineering in Operations Research. He has supervised 72 doctoral students and he is currently supervising 25 others. He has been a member of the National Academy of Engineering since 2005, is an INFORMS fellow, and has received numerous research awards—including the John von Neumann Theory Prize for fundamental, sustained contributions to the theory of operations research and the management sciences and the INFORMS Presidents Award recognizing important contributions to the welfare of society, both in 2019. He has been a serial entrepreneur in the area of analytics and he is a co-founder of 10 analytics companies.



Michael Bratt

Michael Bratt is a Consultant for INSEAD, leading the analytical work of the Global Talent Competitiveness Index by being responsible for the calculation and analysis of the country and city rankings. Prior to his current role he was Consultant and Associate Economic Affairs Officer at United

Nations Conference on Trade and Development (UNCTAD), working primarily on issues of trade and development related to least-developed countries and landlocked developing countries. Other past work experience includes consulting for the World Trade Organization and working as an analyst at the Swedish National Board of Trade, CUTS International, and Mintel International. He holds a PhD in Economics from the University of Geneva and a Master of International Law and Economics from the World Trade Institute (University of Bern).



Giulio Caperna

Giulio Caperna is a Researcher and Statistician at the European Commission's Joint Research Centre in Ispra, Italy. Before joining the Competence Centre on Composite Indicators and Scoreboards (COIN), Dr Caperna worked at the University of Padua as a Post-Doc Researcher where he taught

statistics and the construction of composite indicators. Before earning his PhD in Statistical Science at the University of Padua, he worked as Data-Manager and Data-Analyst in a medical department in Rome. He studied Statistical Science and Demography at the 'Sapienza' University of Rome. His main research interests include the methodology of composite indicators, as well as its use for the description of complex concepts such as civic participation and well-being.



Fabio Caversan

Fabio Caversan is an expert in Artificial Intelligence (AI) and cognitive sciences, co-founding a computer software company 10 years ago in Brazil. The company, Woopi, was acquired by Stefanini in 2013. Mr Caversan is responsible for creating the Sophie platform, Stefanini's AI assistant. Sophie can

be uniquely integrated with various technologies, continuing to learn with each interaction in order to help enterprises run more efficiently.

Mr Caversan has a strong background in academics, teaching the disciplines of computational logic, data structures and algorithms, and AI at Facens, an engineering school in Sao Paulo. For 15 years, he shared his knowledge and passion for computer engineering with students.

Mr Caversan is now the AI Research and Development Director at Stefanini based in Southfield, Michigan. He leads the company's efforts in cognitive sciences and AI, ensuring that Stefanini's innovative technology continues to propel businesses forward.



Alain Dehaze

Alain Dehaze is CEO of the Adecco Group, the world's leading HR solutions company. Through its international brands Adecco, Adia, Modis, Badenoch & Clark, General Assembly, Lee Hecht Harrison, Pontoon, Spring Professional, Vetterly, and YOSS, the Adecco Group delivers on its mission to

make the future work for everyone.

As a Fortune 500 Company, the Adecco Group enables around 3.5 million people to participate in the world of work and assists more than 100,000 organisations successfully navigate the work-life cycle. With 34,000 full-time team members in 60 countries, the Adecco Group ranked 11th on the 2019 World's Best Workplaces list, the only HR solutions company in the top 25.

The 55-year-old Belgian national graduated as a Commercial Engineer from the ICHec Brussels Management School before rising through the ranks at Henkel and ISS. He joined the workforce solutions sector in 2000, when he was appointed Managing Director of Creyf's Interim in Belgium. His path took him to the CEO position at Solvus, COO of USG People—when the latter took over Solvus—and CEO of the Dutch staffing services company Humares between 2007 and 2009.

Mr Dehaze joined the Adecco Group in 2009 as a member of the Executive Committee, responsible first for Northern Europe, then for the Group's largest market, France, before taking on the CEO position in September 2015. Mr Dehaze plays an active role in shaping the labour markets of tomorrow as board member of the Global Apprenticeship Network (GAN), a member of the ILO Global Commission on the Future of Work, and as Steward of the World Economic Forum's System Initiative 'Shaping the Future of Education, Work and Gender'.

Before leading the Adecco Group, he held board positions at the sector level with the World Employment Confederation, including the Vice-Presidency of the World Employment Confederation Europe (formerly EUROCIETT).



Theodoros (Theos) Evgeniou

Professor Evgeniou has been working on Machine Learning and AI for more than 20 years, in areas ranging from computer vision to marketing, project management, healthcare, and finance, among others. He received four degrees from MIT: two BS degrees simultaneously, one in Computer

Science, and one in Mathematics, also graduating first in the MIT dual degrees in Mathematics class; he also earned master's and PhD degrees in Computer Science in the field of machine learning and AI. At INSEAD he has been developing and teaching courses on Data Science and Machine Learning/AI for Managers and Executives, on Decision-Making, and on IT strategies. Professor Evgeniou gives talks and consults for a number of organisations in his areas of expertise. In recent years he has been also an advisor for hedge funds. More recently his interests focus on the broader topic of AI, business, and society, working on areas ranging from AI and regulation to AI innovations for business process optimisation to new methodologies—for example, for explainable AI. He is particularly interested in innovative 'Human+Machine' models to improve business decisions and performance.

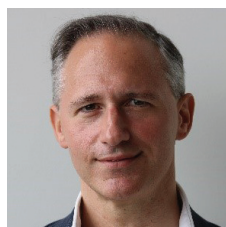


Anja Hendel

Since 2017, Anja Hendel has been Director of Innovation Management and Digital Transformation for Finance at Porsche AG and she works alongside Dr Mahdi Derakhshanmanesh to head up the Porsche Digital Lab in Berlin. This technical laboratory is a platform for collaborating with technology

companies, start-ups, and scientific institutions, and deals with the practical application of concepts such as blockchain, Artificial Intelligence, and the internet of things at Porsche. With a degree in Business Data Processing, Anja Hendel worked as Assistant to the Chief Financial Officer at Porsche from 2015 onwards, and was responsible for the IT portfolio and strategy from 2013 onwards.

Before joining Porsche, she managed various departments at former pharmaceutical company Celesio AG (now known as McKesson Europe AG) from 2007 onwards, including the 'SAP services' and 'IT project portfolio' departments. Prior to these roles, Ms Hendel worked at Stuttgart-based consulting firm Capgemini Deutschland GmbH for six years.



Ivan Jiménez Aira

Versatile director and dedicated, Ivan Jiménez Aira has eight years of experience as Managing Director in Bizkaia Talent, an organisation with international expansion and a close relationship with the entire Basque network of science and technology and building connections with European and

worldwide organisations focused on Talent Attraction. With the support of the Department for Economic Development of the Provincial Council of Bizkaia, and the largest Basque enterprises, technology and research centres, and all the Basques universities, Bizkaia Talent was established in 2005 as a non-profit organisation with a clear mission: to foster and facilitate the implementation of the necessary conditions for attracting, connecting, and retaining in the Basque Country highly qualified people in the areas of knowledge and innovation. Mr Jiménez Aira has been a participant in many international conferences as a speaker and author of different articles in the international press about territorial talent management and the different services and tools of Bizkaia Talent as one of the best examples worldwide. He is also the promoter and creator of the 'Bebasquetalentnetwork', the largest network of professionals related to the Basque Country, with more than 13,000 people in more than 100 countries around the world. Finally, he is also the promoter and creator of the Basque Talent Observatory, Be Basque Career Development and Headhunting support centres, and of the first Dual Career Centre in the Spanish State, 'Bebasque Dual Career Centre'.



Leire Lagunilla Ramos

Leire Lagunilla is the Innovation Manager at Bizkaia Talent. She is also the coordinator of the Be Basque Talent Conferences, international professional networking meetings, which bring together a number of Basque players coming from industry and academia, as well as from public administration

with highly qualified professionals working abroad. She also participates in various international projects, such as The Wellbeing Project.

In 2018 Ms Lagunilla was appointed President of Seber Altube Ikastola, S.Coop., an educational cooperative that is part of the European Cooperative Ikastolen Elkarte that coalesces around 110 educational centres and 56,000 pupils and students. Its educational model is based on the pedagogy of trust; that is, putting the children and youngsters in the centre, providing them the tools to believe in themselves, to trust others and the environment.

Before joining Bizkaia Talent, she developed professionally at the finance department of a big aluminium multinational, a BigFour consultancy providing advice to a public sector entity and within the Human Resources area at Airbus Operations GmbH in Germany. Ms Lagunilla holds a Business Administration and Management degree and an MBA in Managerial Development from the Deusto Business School - Deusto University and a Master's degree on Open Innovation and Intrapreneurship from MTA - Mondragon Team Academy, Mondragon University.



Bruno Lanvin

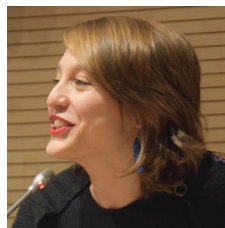
Bruno Lanvin is the Executive Director of INSEAD's Global Indices (the Networked Readiness Index of the Global Information Technology Report, the Global Innovation Index, and the Global Talent Competitiveness Index). Before joining INSEAD, he worked for the World Bank, where he was

inter alia Senior Advisor for E-strategies, Regional Coordinator (Europe and Central Asia) for ICT and e-government issues, and Chairman of the Bank's e-Thematic Group.

Since 2002 he has been co-authoring the *Global Information Technology Report* (INSEAD-World Economic Forum); he is currently (and has been since 2007) the co-editor of the *Global Innovation Index Report* (INSEAD-WIPO-Cornell University).

From June 2001 to December 2003, he was the Manager of the Information for Development Program (infoDev) at the World Bank. In 2000, Dr Lanvin was appointed Executive Secretary of the G8-DOT Force. Until then, he occupied several high-level positions at the United Nations in Geneva and New York, including that of Chief of Cabinet of the Director General.

Dr Lanvin holds a BA in Mathematics and Physics from the University of Valenciennes (France), an MBA from Ecole des Hautes Etudes Commerciales (HEC) in Paris, and a PhD in Economics from the University of Paris I (La Sorbonne) in France. He is also an INSEAD alumnus (IDP-C). A frequent speaker at high-level meetings, he advises a number of global companies and governments and has been a member of numerous boards, including those of IDA Infocomm (Singapore), ICANN, GovTech (Singapore), the Mohammed Bin Rashid Center for Government Innovation (United Arab Emirates), IPWatch, and the Association for Accountability and Internet Democracy (AAID).



Valentina Montalto

Valentina Montalto has 10 years of professional experience, combining work in the private sector as researcher and project manager, and in the public sector as policy analyst, with a focus on the potential of culture for economic and social well-being. She is currently a Research Fellow at the

Competence Centre on Composite Indicators and Scoreboards (COIN) of the Joint Research Centre of the European Commission (Italy), where she is coordinating the team developing the 'Cultural and Creative Cities Monitor' project. Prior to joining the European Commission, she worked at the Brussels-based research and advisory company KEA where she co-authored policy-oriented reports assessing the potential of culture for local and regional development and evaluating the relevance and accuracy of available cultural statistics, on behalf of both European institutions and city authorities. Her educational background is in Statistics for the Social Sciences (KU Leuven - QASS Master Degree, 2015), Cultural Economics and Management (University of Bologna - GIOCA Master Degree, 2009), and Tourism Economics (University of Palermo - EGST Bachelor Degree 2006). Dr Montalto was a student at the Collegio Superiore - Excellence School of the University of Bologna, and a visiting student at Carnegie Mellon University (CMU) in Pittsburgh (USA) and at the Ecole Normale Supérieure in Lyon (France).



Felipe Monteiro

Felipe Monteiro is the Academic Director of the GTCI, Senior Affiliate Professor of Strategy at INSEAD, France, and a Senior Fellow of the Wharton School Mack Institute for Innovation Management. Before joining INSEAD, he was a standing faculty member at the Wharton School. He has also worked

as a Senior Researcher at the Harvard Business School's Latin American Research Center in Brazil and taught at the London School of Economics (LSE).

His research explaining the patterns of inter- and intra-firm knowledge-sourcing processes in multinational organisations has been published in top academic journals such as the *Strategic Management Journal*, *Organization Science*, *Research Policy*, and the *Journal of International Business Studies*, among others. His research has also received prestigious awards from the Strategic Management Society, the Academy of Management, and the Academy of International Business. He has received multiple teaching awards and published several case studies at Harvard Business School, London Business School, and INSEAD.

Professor Monteiro obtained his PhD in Strategic and International Management at the London Business School. He also has an LLB (JD equivalent) degree, cum laude, from the Federal University of Rio de Janeiro, an MSc in Business Administration from COPPEAD/UFRJ, Brazil, and an MRes in Business Studies from London Business School.



Alistair Nolan

Alistair Nolan is a Senior Policy Analyst in the OECD's Directorate for Science, Technology and Innovation. He is currently coordinating various streams of OECD substantive work on artificial intelligence. For the past two years he has also managed OECD work on the impacts of emerging technologies on production, leading to the 2017 book *The Next Production Revolution: Implications for Governments and Business*. This work was referenced at the start of the G7 Action Plan, at the 2017 meeting of the G7 in Taormina. Mr. Nolan authored the chapter on 'Artificial Intelligence in the Next Production Revolution' in the 2018 edition of the OECD's *Science, Technology and Innovation Outlook*. He is also the editor and co-author of the forthcoming book *The Digitalisation of Science, Technology and Innovation: Key Developments and Policies*.



Hedvig Norlén

Hedvig Norlén is a Statistician at the Competence Centre on Composite Indicators and Scoreboards (COIN) of the Joint Research Centre of the European Commission (Italy). She conducts research on multi-dimensional measures for evidence-based policymaking on social, economic, and health issues. She has also experience as biostatistician and has worked with statistical data analysis in genomics, proteomics, and alternative approaches to predictive toxicology. Her previous work experience includes academia, the private sector, and the European Commission. Ms Norlén has a Bachelor and Master of Science degree with a major in Mathematical Statistics from Stockholm University and has done doctoral studies in Biostatistics at Stockholm University and Royal Institute of Technology, Stockholm.



Karine Perset

Karine Perset is Economist and Policy Analyst on Artificial Intelligence Policy at the Organisation for Economic Co-operation and Development (OECD), in the Division for Digital Economy Policy in Paris. She focuses on trends in development and diffusion of AI, on opportunities and challenges that AI raises for public policy, and oversees OECD.AI, the OECD's AI Policy Observatory. She was previously Senior Director and Advisor to ICANN's Governmental Advisory Committee (GAC) in Los Angeles and yet before that was the Counsellor of the OECD's Directors for Science, Technology and Innovation. She has a dual master's in Telecommunications and in International Economics from the University of Paris Dauphine.



Michaela Saisana

Michaela Saisana is Acting Head of the Monitoring, Indicators and Impact Evaluation Unit and she also leads the European Commission's Competence Centre on Composite Indicators and Scoreboards (COIN) at the Joint Research Centre in Italy. She has been working at the JRC since 1998, where she obtained a prize as 'best young scientist of the year' in 2004 and together with her team the 'JRC policy impact award' for the Social Scoreboard of the European Pillar of Social Rights in 2018. She collaborates, by auditing performance indices, with over 150 international organisations and world-class universities, including the United Nations, Transparency International, Oxfam, the World Economic Forum, INSEAD, the World Intellectual Property Organization, Yale University, Columbia University, and Harvard University. She is a highly cited scientist with over 11,000 citations in Google Scholar and is a co-author of two books: 2008 OECD/JRC *Handbook on Constructing Composite Indicators* and 2008 *Global Sensitivity Analysis: The Primer* (Wiley).



Nicolas Schmit

Nicolas Schmit is a politician from Luxembourg who has been serving as a Member of the European Parliament since the 2019 European elections. A member of the Luxembourg Socialist Workers' Party (LSAP), he was previously a member of the government of Luxembourg from 2004 until 2019.

Mr Schmit studied Economics in France at Sciences Po Aix. He began his political and diplomatic career in 1979 as an attaché in the Prime Minister's office in Luxembourg, followed by the Foreign Ministry, and has held various government positions ever since.

Since the 2019 European elections, Mr Schmit has been a Member of the European Parliament, where he belongs to the Progressive Alliance of Socialists and Democrats (S&D) group. He has since been serving on the Committee on Employment and Social Affairs. On 10 September 2019, Nicolas Schmit was nominated to be the European Commissioner for Jobs and Social Rights. He agreed to receive the GTCI team on that same day and gave his first interview on the theme of *AI and Talent Competitiveness*. The first part of the interview focused on Luxembourg, and the second on prospects and challenges for the European Union.



Marco Stefanini

Since its inauguration, the history of Stefanini, one of the largest national technology companies, portrays the entrepreneurial spirit of its founder and global CEO, Marco Antônio Stefanini. After graduating from USP University in Geology, Marco Stefanini began his career in computer science as a trainee at Bradesco, Brazil's largest private bank.

As the leader of Stefanini, he fielded several economic crises, disputing the market with multinational giants, always with an early vision of the business. Thanks to this, he detected niches and acquired experiences that gave Stefanini continuous growth over its 30 years of operation and geographic expansion both in Brazil and abroad, transforming the company into the fifth most internationalized multinational, according to the Dom Cabral Foundation Ranking.

Always active in its segment, he was one of the founders of the Brazilian Association of Software Companies and Services for Export (BRASSCOM). Mr Stefanini received some important acknowledgements in the area of technology. He has been in the ranks of Nearshore Americas twice as one of the most influential executives in the outsourcing industry and has been nominated for the IAOP Hall of Fame (the International Association of Outsourcing Professionals). In 2013, he was named Entrepreneur of the Year by Ernst & Young Terco, and recently he was invited by INSEAD to talk about the company's trajectory, which will be transformed into a successful case.



Kent Walker

Kent Walker is Senior Vice President, Global Affairs, at Google. He has worked at the nexus of cutting-edge technology, policy, and legal issues for over 20 years. He currently oversees Google's legal, policy, and compliance affairs, product policies, philanthropic efforts, and work with governments

around the world.

Before joining Google, Mr Walker held executive positions at leading technology companies, including eBay, Netscape, AOL, and Airtouch Communications. He served as an Assistant US Attorney with the US Department of Justice and advised the Attorney General on technology policy issues. At the start of his career, he worked as a litigator specializing in government and public law issues.

Mr Walker graduated with honors from Harvard College and Stanford Law School. He has served on the boards of a variety of industry associations and currently serves on the Harvard Board of Overseers. He is a member of the Council on Foreign Relations.



Andrew Wyckoff

Andrew W. Wyckoff is the Director of the OECD's Directorate for Science, Technology and Innovation (STI) where he oversees OECD's work on innovation, business dynamics, science and technology, information and communication technology policy as well as the statistical work associated

with each of these areas. His experience prior to the OECD includes positions at the US Congressional Office of Technology Assessment (OTA), the US National Science Foundation (NSF), and The Brookings Institution. He has served as an expert on various advisory groups and panels that include joining the Global Board of Trustees of Digital Future Society (DFS), being a member of the Research Advisory Network for the Global Commission on Internet Governance, the International Advisory Board of the Research Council of Norway, and Head of OECD's Delegation at the G20 and G7 meetings on ICT and Digital Economy.



Houlin Zhao

Houlin Zhao was first elected 19th Secretary-General of the ITU at the Busan Plenipotentiary Conference in October 2014. He took up his post on 01 January 2015. ITU Member States re-elected Mr Zhao as ITU Secretary-General on 01 November 2018, and he began his second four-year term on

01 January 2019.

Prior to his election, he served two terms of office as ITU Deputy Secretary-General (2007–2014), as well as two terms as elected Director of ITU's Telecommunication Standardization Bureau (1999–2006). Mr Zhao is committed to further streamlining ITU's efficiency, to strengthening its membership base through greater involvement of the academic community and of small- and medium-sized enterprises, and to broadening multistakeholder participation in ITU's work.

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