Creativity and Prosperity: The Global Creativity Index

MARTIN Prosperity Institute

The Martin Prosperity Institute (MPI) is the world's leading think-tank on the role of sub-national factors — location, place, and city-regions — in global economic prosperity. It takes an integrated view of prosperity, looking beyond traditional economic measures to include the importance of quality of place and the development of people's creative potential.

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EXECUTIVE SUMMARY

The economic crisis has challenged popular conceptions of economic growth, both in terms of what it is and how to measure it. While engendering growth and bolstering competitiveness remain high on the agenda, immediate attention has shifted to creating jobs, lifting wages, addressing inequality, and fostering long-term, sustainable prosperity. This new edition of the Global Creativity Index (GCI), which we first introduced in 2004, provides a powerful lens through which to assess these issues.

The GCI assesses the prospects for sustainable prosperity across 82 nations according to a combination of underlying economic, social, and cultural factors that we refer to as the 3 Ts of economic development—Technology, Talent, and Tolerance. It also compares the GCI to a series of other metrics of competitiveness and prosperity—from conventional measures of economic growth to alternative measures of economic equality, human development, and happiness and well-being.

Our key findings are as follows:

Overall Ranking:

Sweden takes first place on the GCI, maintaining the top position it held in our 2004 edition. The United States takes second place, improving its earlier fourth place finish. Finland takes third place, followed by Denmark in fourth, Australia in fifth, and New Zealand in sixth. Canada takes seventh place together with Norway; Singapore and the Netherlands round out the top ten. Despite their rapid economic rise, the BRIC nations still do not crack the upper tiers of the GCI: Russia ranks 31st, Brazil 46th, India 50th, and China 58th.

Creative Class:

The Creative Class—made up of workers in fields spanning science and technology, business and management, healthcare and education, and arts, culture, and entertainment—is a driving force in economic growth. The Creative Class makes up 40 percent or more of the workforce in 14 nations. Singapore has the highest creative ranking, followed by the Netherlands, Switzerland, Australia, Sweden, Belgium, Finland, Norway, and Germany. Canada ranks 12th, with 40.84 percent of its workforce in the Creative Class, and the United States ranks 27th, with 34.99 percent.

Technology:

Technology is a key factor in economic progress. From new inventions like software, robotics, and biotechnology to improvements in manufacturing systems and processes, technology makes economies and societies more efficient and productive. We assess technological capacity through three measures: research and development spending, R&D workforce, and patented innovations. Finland takes the top spot in technology, followed by Japan in second place, the United States in third, Israel in fourth, and Sweden in fifth. Canada ranks 11th.

Talent:

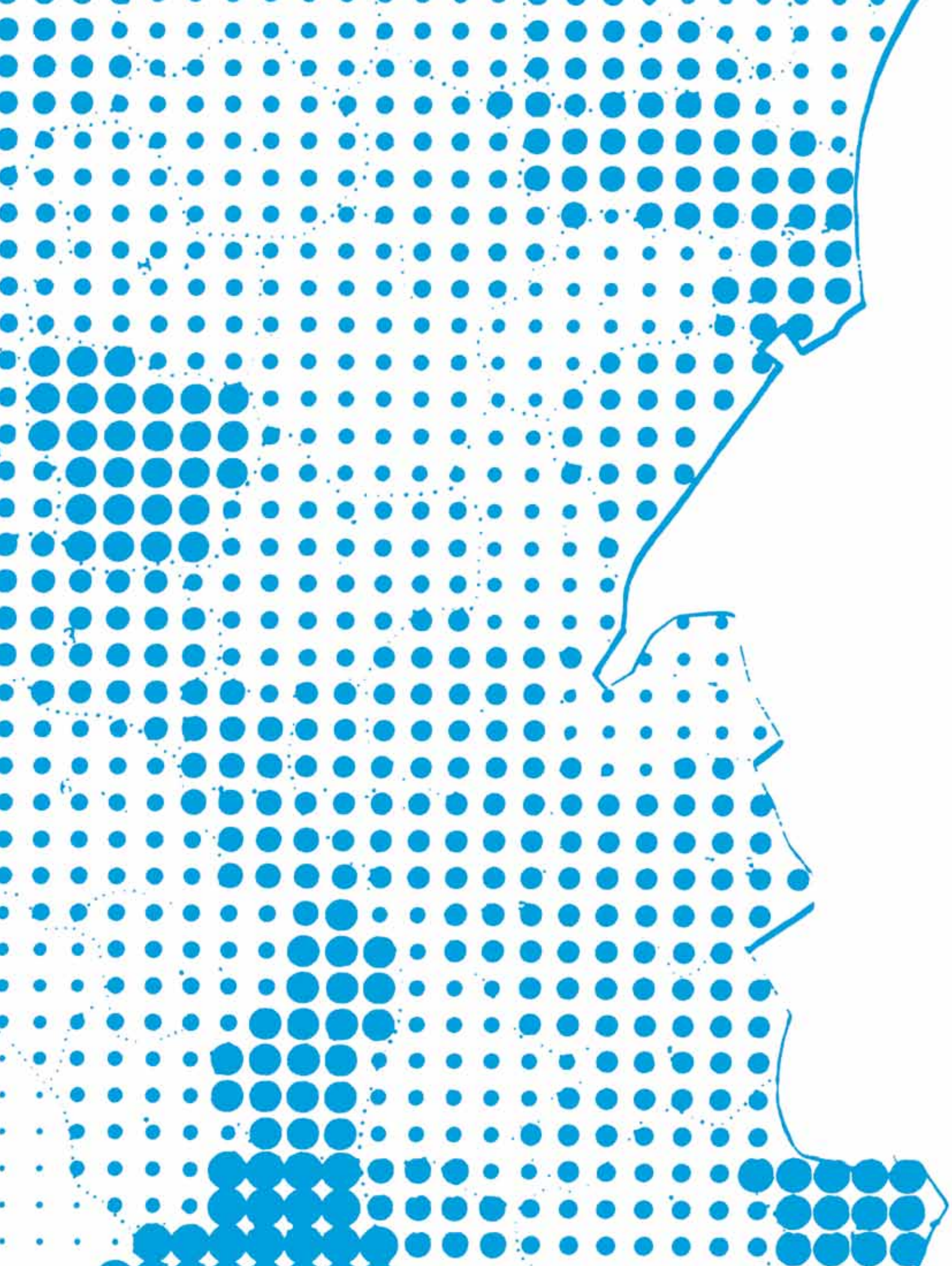
There is a broad consensus that the ability to generate, attract, and retain skilled and enterprising people—talent—is essential to sustained economic success. We measure a country's talent as a combination of two factors: its average levels of educational attainment and the percentage of its workforce in the Creative Class. Scandinavian countries leap to the top, with Finland and Sweden taking first and second place, Denmark in fourth, and Norway sixth. Singapore ranks third, with New Zealand in fifth and Australia in seventh. The United States is eighth, just ahead of Greece and Slovenia in the ninth and tenth spots. Canada ranks 17th.

Tolerance:

Tolerance is the third key factor in economic growth and prosperity. The ability to attract both talent and technology turns on openness to new ideas and openness to people. We measure tolerance as a combination of two variables, based on Gallup surveys of openness to ethnic and racial minorities and openness to gays and lesbians. Canada takes the top spot, followed by Ireland, the Netherlands, New Zealand, and Australia. Spain, Sweden, the United States, Uruguay and the United Kingdom round out the top ten.

Creativity and Prosperity:

We compared the 3 Ts metrics and the GCI to established measures of economic and social progress. The GCI is closely associated with conventional measures of economic output and economic competitiveness. And it is also associated with broader measures of human development and life satisfaction or happiness. Nations that score better on the 3 Ts not only have higher levels of economic output but also higher levels of human development and happiness. We also find that the GCI is associated with greater economic equality—nations which score higher on the GCI have less inequality. Our findings suggest that there are two distinct paths available to greater economic competitiveness. On the one hand, there are nations like the United States and the United Kingdom, where higher levels of economic output and competitiveness occur alongside higher levels of inequality. On the other hand, there are a greater number of nations like Sweden and Norway, where high levels of economic output and competitiveness occur alongside far greater equality. This suggests a high-road path to sustainable prosperity, where the fruits of economic progress are broadly shared.



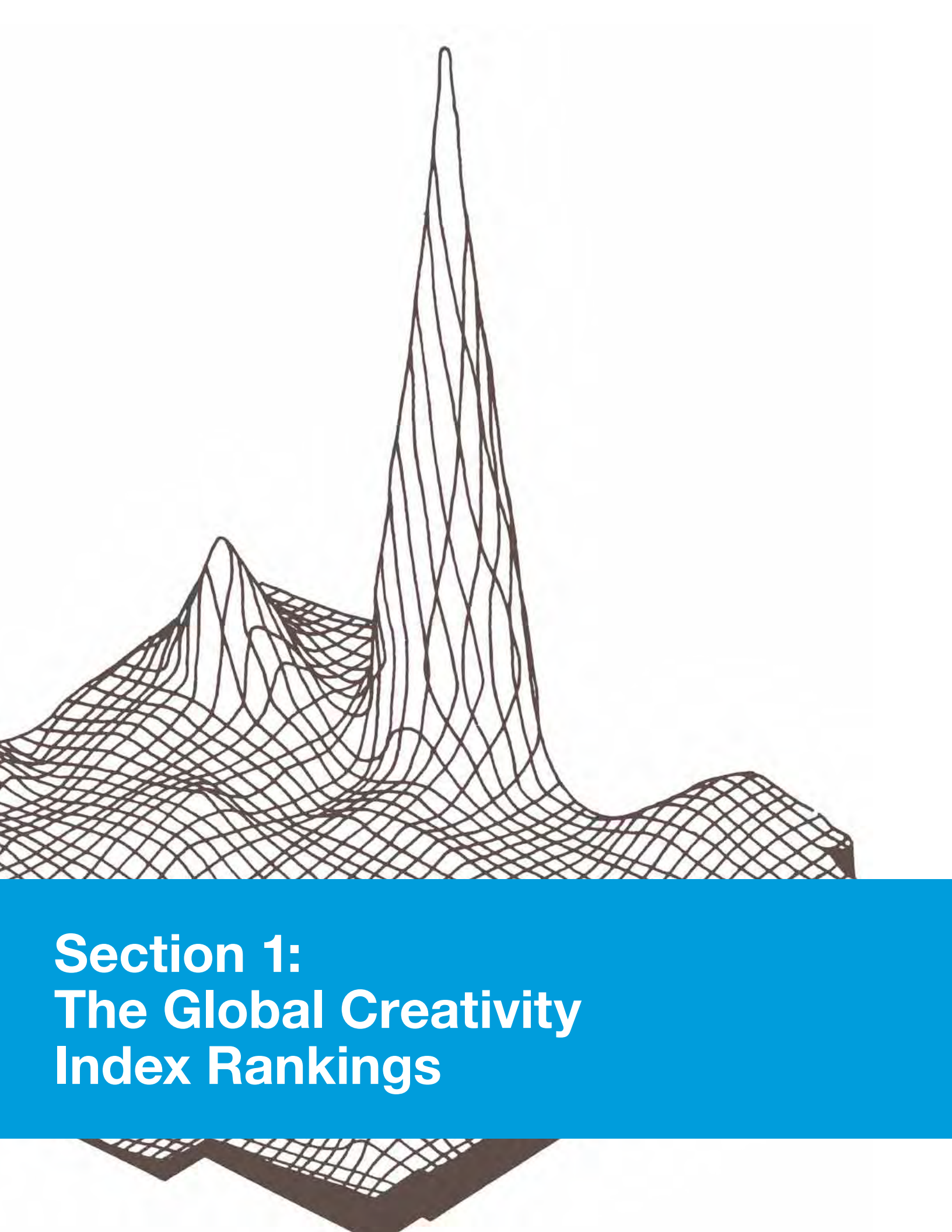
INTRODUCTION

The economic crisis has challenged popular conceptions of economic growth. Fueled by overly risky financial speculation and outright chicanery at times, the pursuit of short-term profits led some of the world's most advanced and affluent economies to the brink of collapse and to the prospect of years, possibly decades, of intractable unemployment and stagnation. We learned the proverbial hard way that the unbridled pursuit of economic growth does not always go hand in hand with rising living standards. While engendering growth and bolstering competitiveness remain on the agenda, attention has shifted to creating jobs, lifting wages, addressing inequality and fostering long-run, sustainable prosperity.

This latest edition of the Global Creativity Index (GCI) addresses these challenges head-on, helping to shift the dialogue from a narrow focus on competitiveness and growth to a broader focus on creativity, prosperity and well-being. Our research is part of a broader challenge to the way we understand economic growth and development. Over the past decade or so, a growing number of students of economic progress have concluded that we need to improve the frameworks, language and metrics that we use to gauge society's overall wealth, and that we need better measurements of human development, well-being, and happiness.

One notable high-level effort was undertaken by French President Nicolas Sarkozy's blue-ribbon Commission on the Measurement of Economic Performance and Social Progress. Chaired by the Nobel Prize winning economists Joseph E. Stiglitz and Amartya Sen, the commission's report challenged conventional measures of economic growth and development [1]. "What you measure affects what you do," noted Stiglitz at the release of the commission's report. "If we have the wrong metrics, we will strive for the wrong things." [1] The commission proposed a range of additional measures of social and economic well-being—from socioeconomic development, sustainable consumption, production, and development, to social inclusion, public health, and sustainable transportation—providing a more robust gauge of economic and social progress. As our economy begins its slow recovery from its gravest crisis in generations, it's essential that we seek not just to hasten the return of short term growth but to lay the foundations for sustainable, long-term prosperity.

Our research takes up this effort to broaden both our understanding and our measures of economic and social well-being. The first part of this report presents our rankings of 82 nations on the GCI, which takes three main classes of economic inputs into account: Technology, Talent and Tolerance (described in greater detail below). We also examine the relationship of these three classes of factors and the overall index to a series of measures of economic and social progress, ranging from conventional measures of economic growth and competitiveness to broader measures of economic equality, human development, and subjective well-being. Our methodology, data sources, and variables are laid out in detail in the appendix to this report.



Section 1: The Global Creativity Index Rankings

CREATIVITY AND THE 3 Ts OF ECONOMIC DEVELOPMENT

Following Adam Smith, classical economists identified three key factors of production as the foundations of economic development: land, labor, and capital [2–4]. But physical factors alone no longer determine progress in today's modern, advanced economies, where factors like technology, innovation, knowledge, and human capital play much greater roles. Underpinning all of them is the role of creativity. Economic growth and development turns on harnessing human creativity across the entire spectrum of innovation through production—from the creation of new technologies and new firms to new and improved processes, more efficient manufacturing and production systems, and increasing effectiveness in the delivery of services.

Creativity differs in a fundamental way from more traditional, tangible factors of production like land or raw materials: it is not a stock of things that can be depleted or worn out, but an infinitely renewable resource that can be constantly improved. *Everyone* is potentially creative. Our future progress and prosperity depends not just on the efforts of a privileged knowledge elite but on how well we can unleash the creativity of each and every human being.

Creativity is mobile and portable—people can and do move. But, it is almost always associated with specific places, as Jane Jacobs has shown [5, 6]. Places—countries, cities, regions—bring together the key inputs from diverse groups of people to the firms and institutions that shape economic and social progress. For these reasons, place has come to replace the corporation as the key economic and social organizing unit of our time.

The GCI offers a new, more unified way to assess the key inputs that drive long-term economic prosperity based on what we have elsewhere dubbed the "3 Ts of economic development," Technology, Talent and Tolerance [7, 8].

Technology

Long recognized as a key driver of wealth and progress, technology is the first essential factor. Karl Marx and later Joseph Schumpeter recognized that advances in technology are what enable capitalism to constantly revolutionize itself [4, 9]. "Capitalism not only never is but never can be stationary," Schumpeter wrote in 1942, as the Great Depression transitioned into a full-blown war economy [9]. In the late 1950s, Robert Solow devised a mathematical formula to capture technology's role as a driving force in economic growth, for which he received the Nobel Prize in economics [10].

Talent

Talent is the second key factor. Starting in the 1960s, Peter Drucker and Fritz Malchup detailed the economic importance of knowledge [11, 12]. Knowledge workers not only invent new machines that turn out old products more efficiently—they come up with completely new products that create whole new markets. Paul Romer's theory of endogenous growth, with its corollary that investment in R&D and education yield tangible returns over the long term, formalized this phenomenon [13]. The generation of new knowledge thus becomes the key driver of economic growth. While knowledge is something that can be codified, creativity and the creation of new ideas, knowledge, and technologies comes from people. Economists agree that skilled, ambitious, and entrepreneurial people—who they refer to as "human capital"—are a central force in economic progress today [14–16].

Tolerance

Tolerance is the third factor in the ranking of economic progress. While most economists tend to see technology and talent as stocks of endowments, the reality is that they are flows. The ability to identify the economic and non-economic factors that account for these flows is essential to an understanding of economic progress. People are not forever-wedded to one place; they can and do move around. The technology and talent that they bring with them are mobile factors, and accordingly flow into and out of cities and regions and nations.

New ideas are generated most efficiently in places where different cognitive styles are tolerated—and different cognitive styles are linked to demographic diversity, as economist Scott Page has shown [17]. Openness to diversity is also in line with the broad cultural shift from materialist values about money and things to newer "post-materialist" values, which favor self-expression and a wider quest for happiness and well-being, as identified by Ronald Inglehart [18–20]. Tolerance—openness to diversity—provides an additional source of economic advantage which works alongside technology and talent. The places that are most open to new ideas and that attract talented and creative people from across the globe broaden both their technology and talent capabilities, thereby gaining a substantial economic edge.

The 3 Ts of economic development work together in mutually reinforcing ways. Any one "T" is a necessary but in itself insufficient condition for economic success. For a nation or region to effectively compete in the creative economy, all 3 Ts have to work together. This is precisely what the GCI measures—the interaction of these 3 Ts—and as such it provides us with a powerful leading indicator of the key ingredients for long-term economic prosperity.

THE GLOBAL TECHNOLOGY MAPS

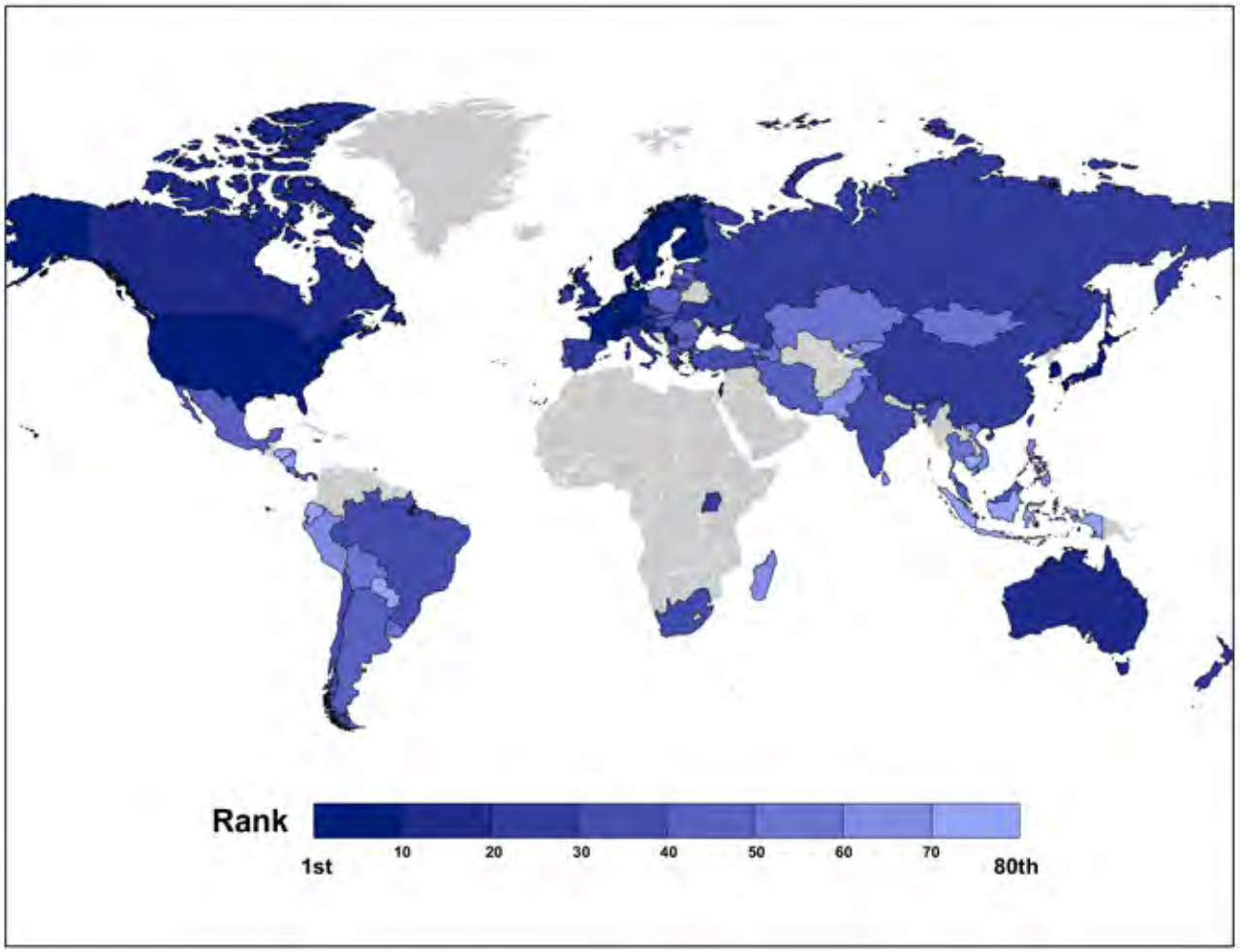
Technology is a key factor in economic progress. From new inventions like software, robotics and biotechnology to improvements in manufacturing systems and processes, technology makes economies and societies more efficient and productive.

We assess national technological capacity through the use of three measures:

1. the financial resources devoted to research and development as a share of total economic output;
2. the share of human resources devoted to R&D, measured as the share of the total labor force made up of researchers; and
3. patents granted per capita, the conventional measure of innovation. If the first two measure critical inputs to the process of technology generation, the third is a measure of innovative output.

The Global R&D Investment Map (**Exhibit 1**) shows how nations stack up on research invest-

The global R&D investment map — Exhibit 1



ment. Israel is in first place, followed by Sweden, Finland, Japan, and Switzerland. The United States, South Korea, Germany, Denmark, and France round out the top ten. Canada ranks 13th.

We now turn to our second measure of technology—The Global Researchers Map (**Exhibit 2**), which measures researchers per capita. Now Finland takes top place, followed by Sweden, Japan, Singapore, and Denmark to make up the top five. Norway, the United States, Australia, Canada, and New Zealand round out the top ten.

Our third measure of technology, The Global Innovation Map (**Exhibit 3**), assesses innovative output, which we measure as patents per capita. The United States takes first place,

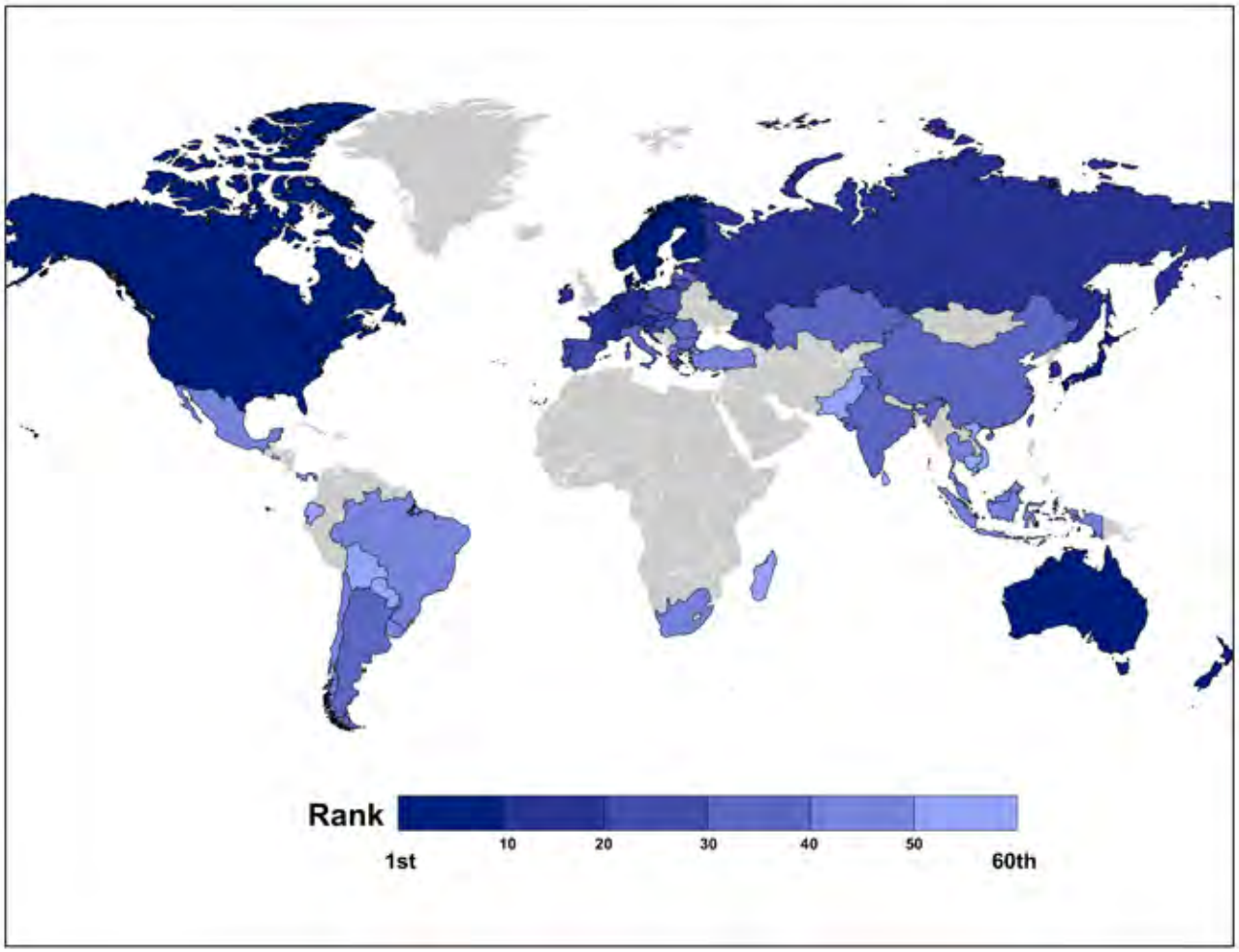
Global Technology—Technion University, Israel

After years of discussion and related activities and with Albert Einstein's deep involvement, Technion University was founded in 1924 in Haifa, Israel. Its first graduating class was 16 students who majored in either Civil Engineering or Architecture. By 2010, Technion had awarded 90,604 degrees. Technion graduates comprise the majority of Israeli-educated scientists and engineers and over 70% of the country's founders and managers of high-tech industries. Israel is home to the greatest concentration of high-tech start up companies anywhere outside of the Silicon Valley—many started by Technion graduates. High-tech industry now accounts for more than 54% of Israel's industrial exports, and over 26% of the country's total exports. Nine out of every 1,000 workers are engaged in R&D, nearly double the rate of the United States and Japan. Seventy-four percent of managers in Israel's electronic industries hold Technion degrees.

http://www1.technion.ac.il/en/about

The global researchers map

Exhibit 2



followed by Japan, Switzerland, Finland, and Israel. Sweden, Germany, Canada, Denmark and Hong Kong round out the top ten.

The Global Technology Map (**Exhibit 4**) puts all three of the technology measures together to show how the world's nations stack up on an overall index of technology.

Finland takes the top spot overall, ranking first in researchers, third in R&D investment, and fourth in innovation. Home to Nokia and many innovative small firms, Finland is an acknowledged leader in innovative communications technology.

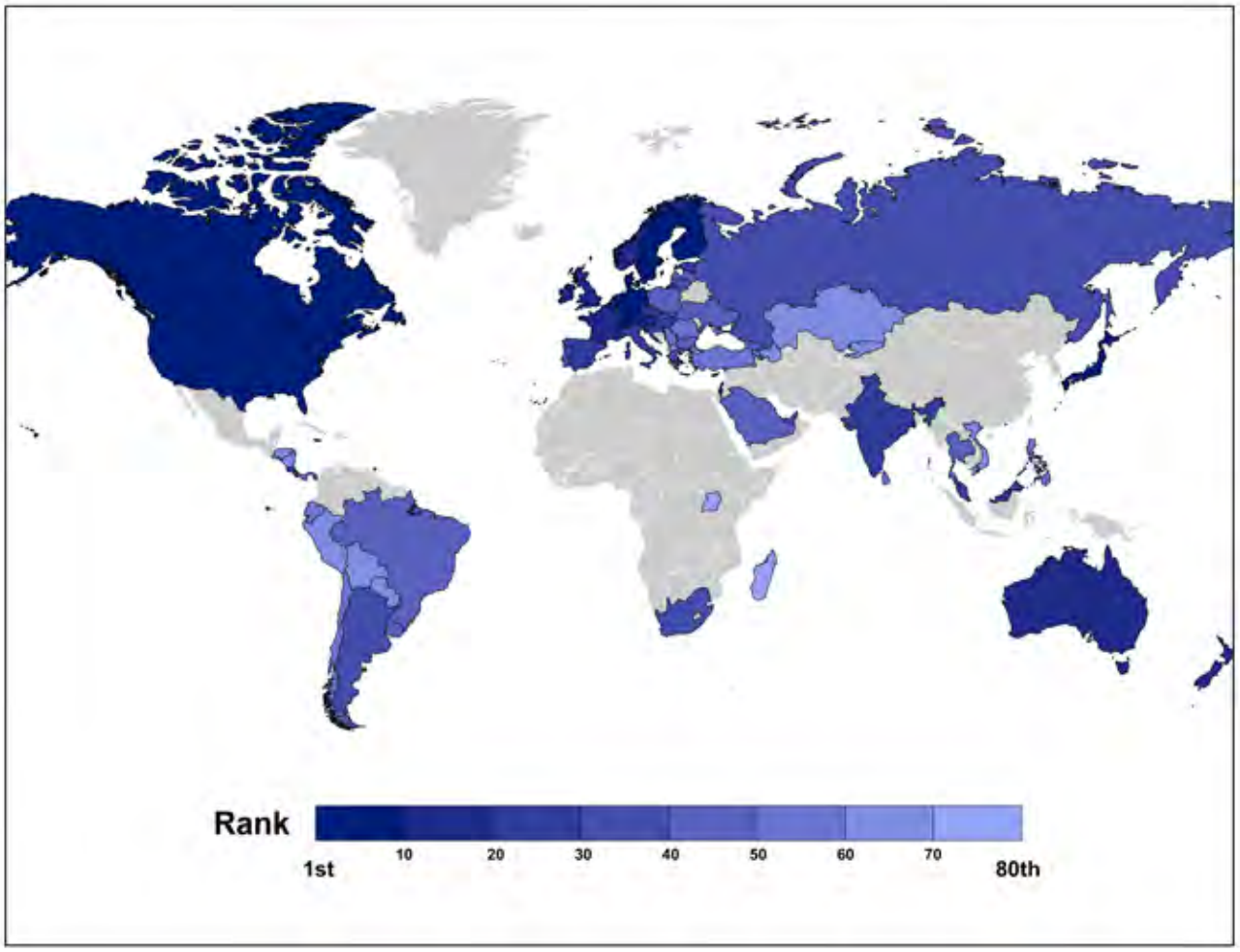
Japan takes second place, ranking fourth in R&D investment, third in researchers, and second in innovation. Japanese companies have not only consistently pushed the technology envelope, they have followed through, building reliable, subsequent generations of products, from high quality cars to flat panel displays.

The United States ranks third, finishing sixth in R&D investment and seventh in researchers, but solidly in first place for innovation. With its infrastructure for entrepreneurial venture capital finance in Silicon Valley and elsewhere, the United States has seen a long list of high-tech startups turn into global giants, including Microsoft, Apple, Google, and Yahoo.

Israel's fourth place rank might come as a surprise to some, considering its small size, but it ranks first in R&D investment. Israel has the highest concentration of engineers in the world—135 per 10,000 people, compared to 85 per 10,000 people in the United States. A recent book by Dan Senor and Saul Singer,

The global innovation map

Exhibit 3



Start-up Nation: The Story of Israel's Economic Miracle shows how Israel has pursued a technology strategy based on launching new innovative firms [21].

Sweden takes fifth place and Switzerland, Denmark, Korea, Germany and Singapore round out the top ten. Canada ranks 11th.

While much has been made of the ascendance of the BRIC countries—Brazil, Russia, and especially India and China—generally, they do not rank highly on our technology measure. The highest ranking BRIC nation is Russia, in the 28th spot. China ranks 37th, about the same as Latvia and Bulgaria. Brazil takes 48th place and India 49th, just behind Serbia and Croatia.

THE GLOBAL TALENT MAPS

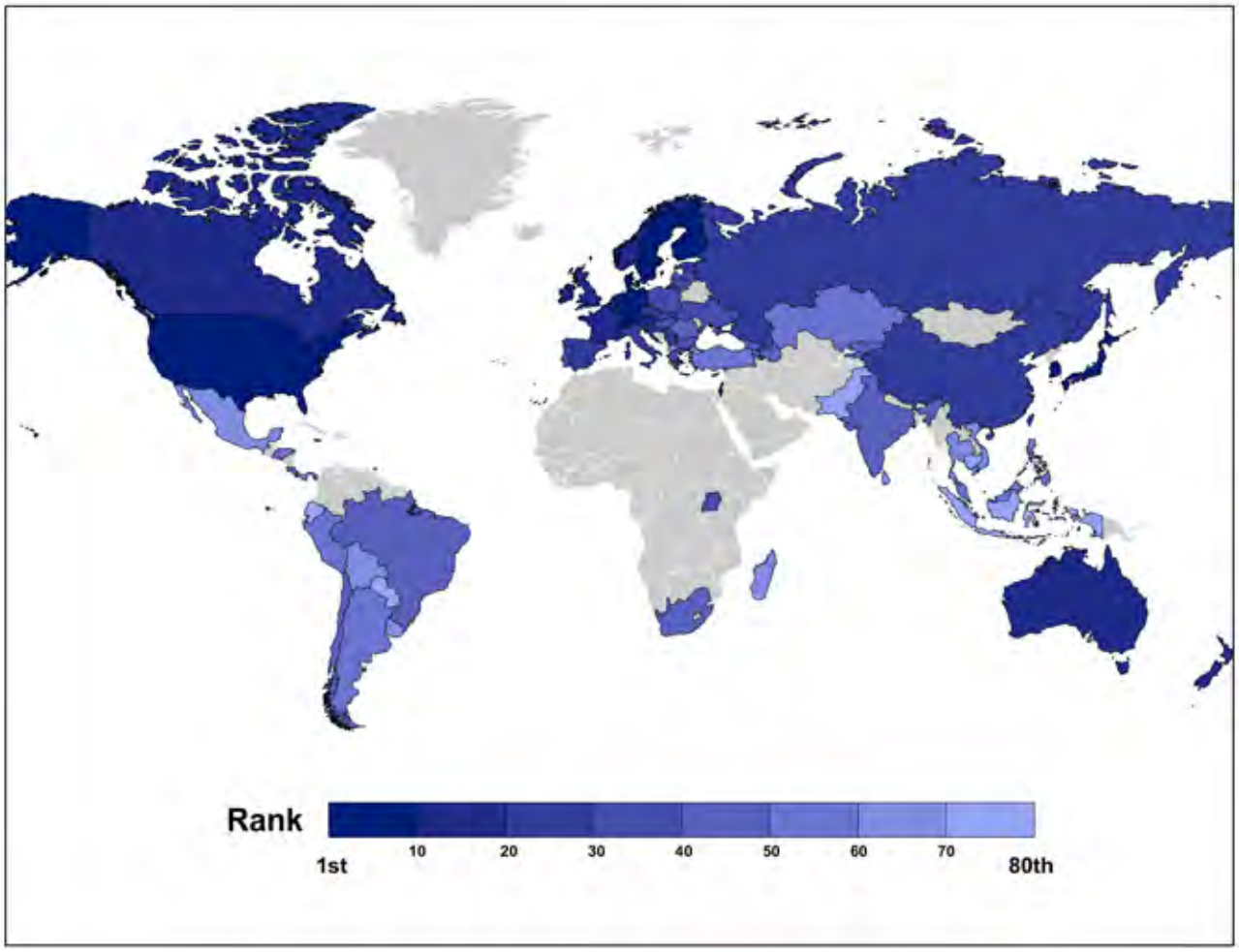
We turn now to the second T, talent. There is a broad consensus that a country's ability to generate, attract, and retain skilled people will be a key factor in its future economic success.

We measure talent as a combination of two factors. The first is the conventional measure of human capital based on educational attainment. The second is a measure of the Creative Class, which includes workers in fields such as technology, science, and engineering; business, management, and finance; design and architecture; arts, culture, entertainment, and media; law, healthcare, and education.

We begin by looking at how nations stack up on the first of our talent measures, global human capital (**Exhibit 5**), which charts the level of educational attainment. Human capital is measured as the share of the population in the proper age group

The global technology map

Exhibit 4



Global Talent—Singapore and Higher Education

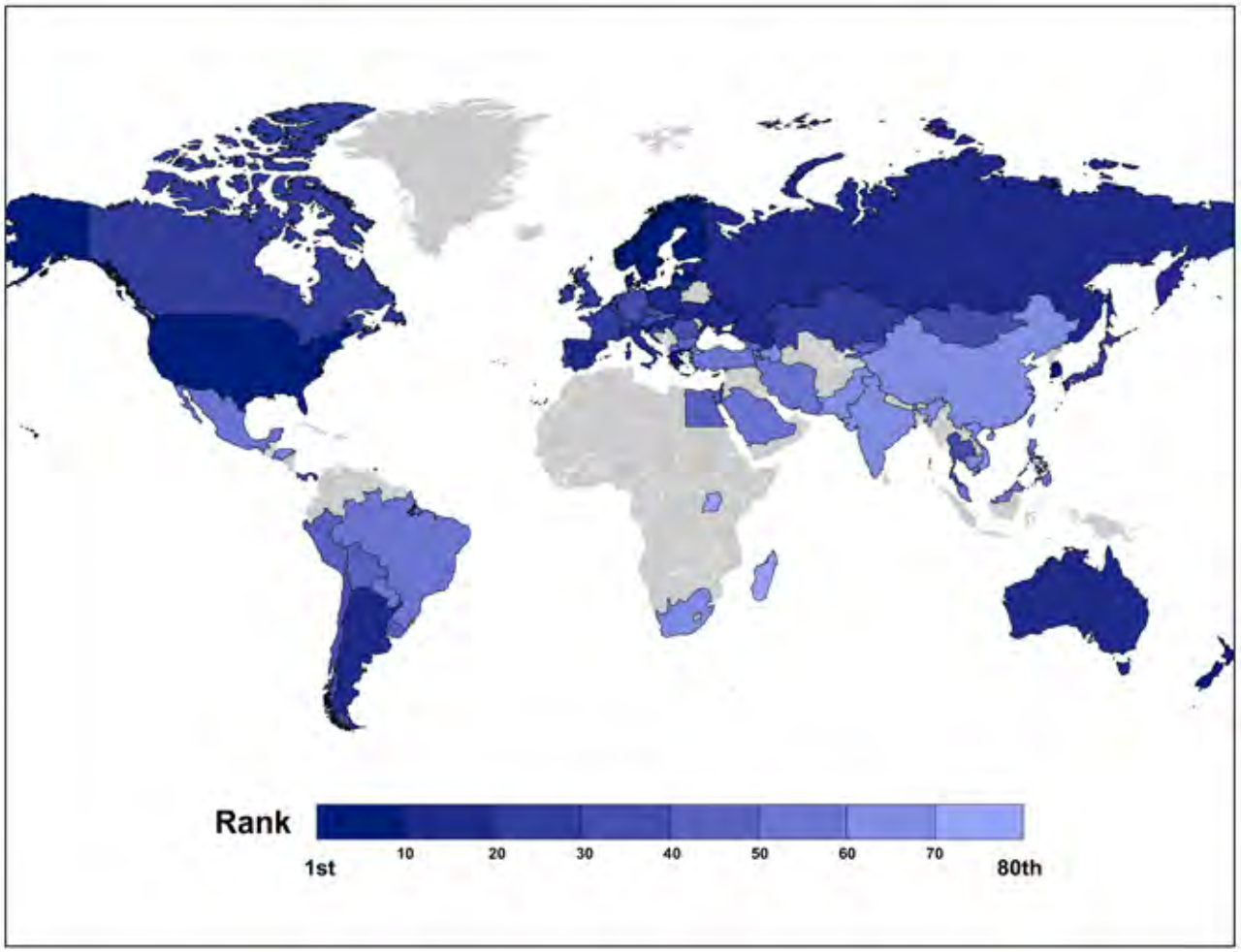
Singapore is home to five public universities: the National University of Singapore, Nanyang Technological University, Singapore Management University, the Singapore University of Technology and Design, and the Singapore Institute of Technology. Additionally, SIM University (UniSIM) provides university education to working professionals and adult learners.

Singapore is also home to several specialized private universities. The University of Chicago Booth School of Business offers an Executive MBA. DigiPen Institute of Technology provides university education and training in game software engineering. ESSEC Business School is a major player in international management education. The German Institute of Science and Technology-TUM Asia is a subsidiary of Technische Universität München and provides a variety of engineering and technical degrees. The INSEAD-Wharton Alliance combines INSEAD's resources with those of Wharton's to deliver business education and research across a global learning network. The S P Jain Institute of Management & Research offers an Executive MBA programme and a Global MBA programme conducted jointly from both the campuses in Dubai and Singapore. At the Tisch School of the Arts Asia, students have the opportunity to earn a Master of Fine Arts. UNLV Singapore offers a fully accredited Bachelor of Science Degree in Hotel Administration as well as an Executive Masters Degree in Hospitality Administration.

http://www.moe.gov.sg/education/post-secondary/

The global human capital map

Exhibit 5



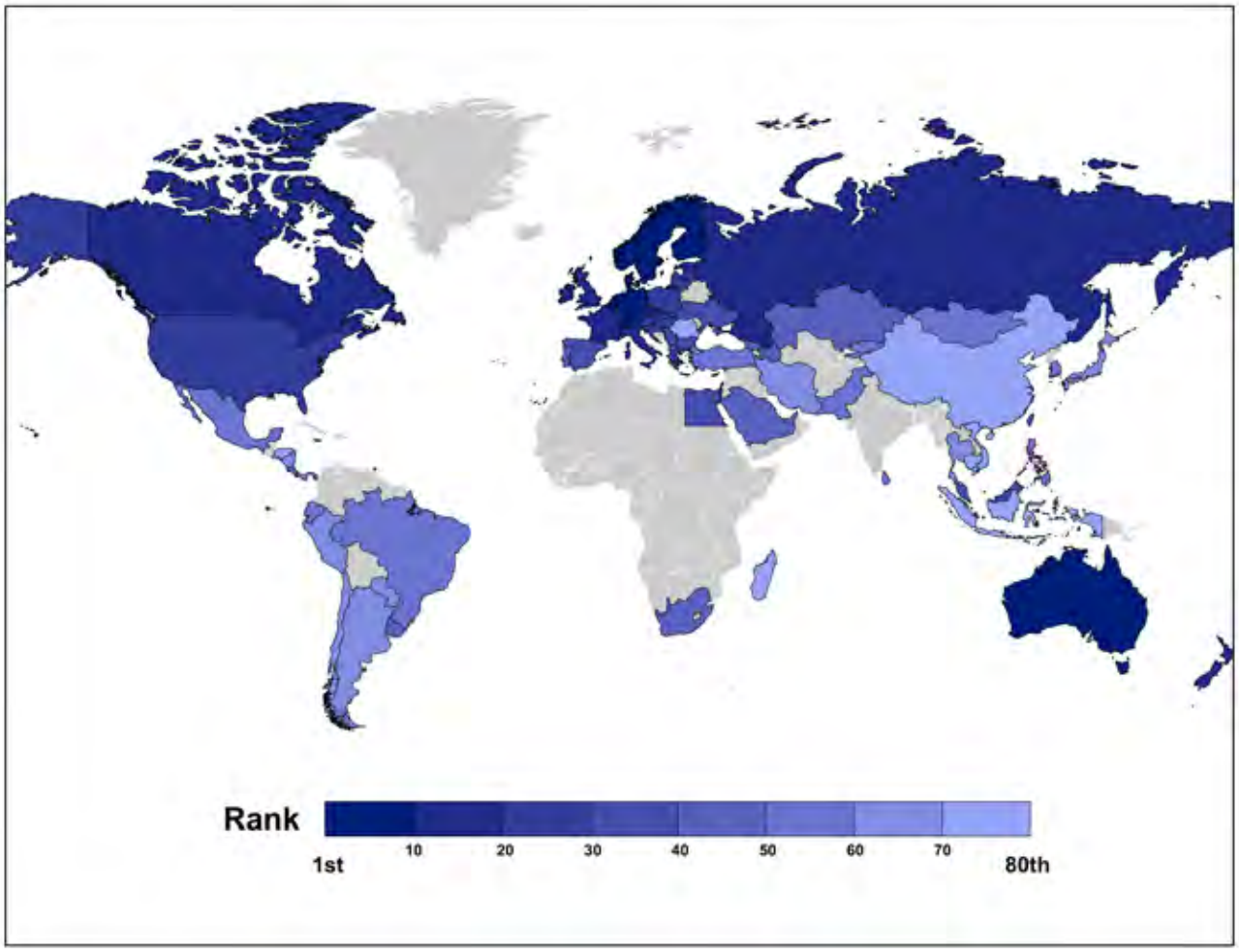
that has engaged in tertiary education. While Finland takes the top spot with 90.8 percent and South Korea takes second (89.8 percent), there are several surprises among the top ten, notably Greece in third place, Slovenia in ninth, and Latvia in tenth. New Zealand, Sweden, the United States, Norway, and Denmark round out the top ten. Canada ranks 21st.

The global Creative Class map (**Exhibit 6**) illustrates how nations stack up on Creative Class membership. The range is quite large, from 47.3 percent on the high end to 2.4 percent on the low end. Fourteen countries have 40 percent or more of their workforce in the Creative Class. Aside from Singapore, which takes the top spot, and Australia in fourth place, the map is dominated by Scandinavian and Northern European nations: The Netherlands (46.2 percent), Sweden (43.9 percent), Switzerland (44.8 percent), Belgium (43.8 percent), Denmark (43.7 percent), Finland (43.4 percent), Norway (42.1 percent), and Germany (41.6 percent).

Canada ranks 12th with 40.8 percent of its workforce in the Creative Class. With 35 percent of its workforce in the Creative Class the United States ranks 27th, just behind Slovakia and Hong Kong (both 35.2 percent). Of the BRICs, Russia ranks highest at 20th (38.6 percent). Brazil is 57th (18.5 percent), and China 75th (7.4 percent).

The global talent map (**Exhibit 7**) shows how nations rank

The global Creative Class map — Exhibit 6



on our overall Talent Index. There are dramatic differences between this list and the global technology map. The Scandinavian countries are at the top with Finland and Sweden taking first and second place; Denmark and Norway are in fourth and sixth place. Singapore ranks third, with New Zealand in fifth and Australia in seventh. The United States is eighth, just ahead of Greece and Slovenia in the ninth and tenth spots. Canada ranks 17th. Of the BRICs nations, Russia ranks highest at 13th, with Brazil in 66th, India in 75th, and China in 76th place.

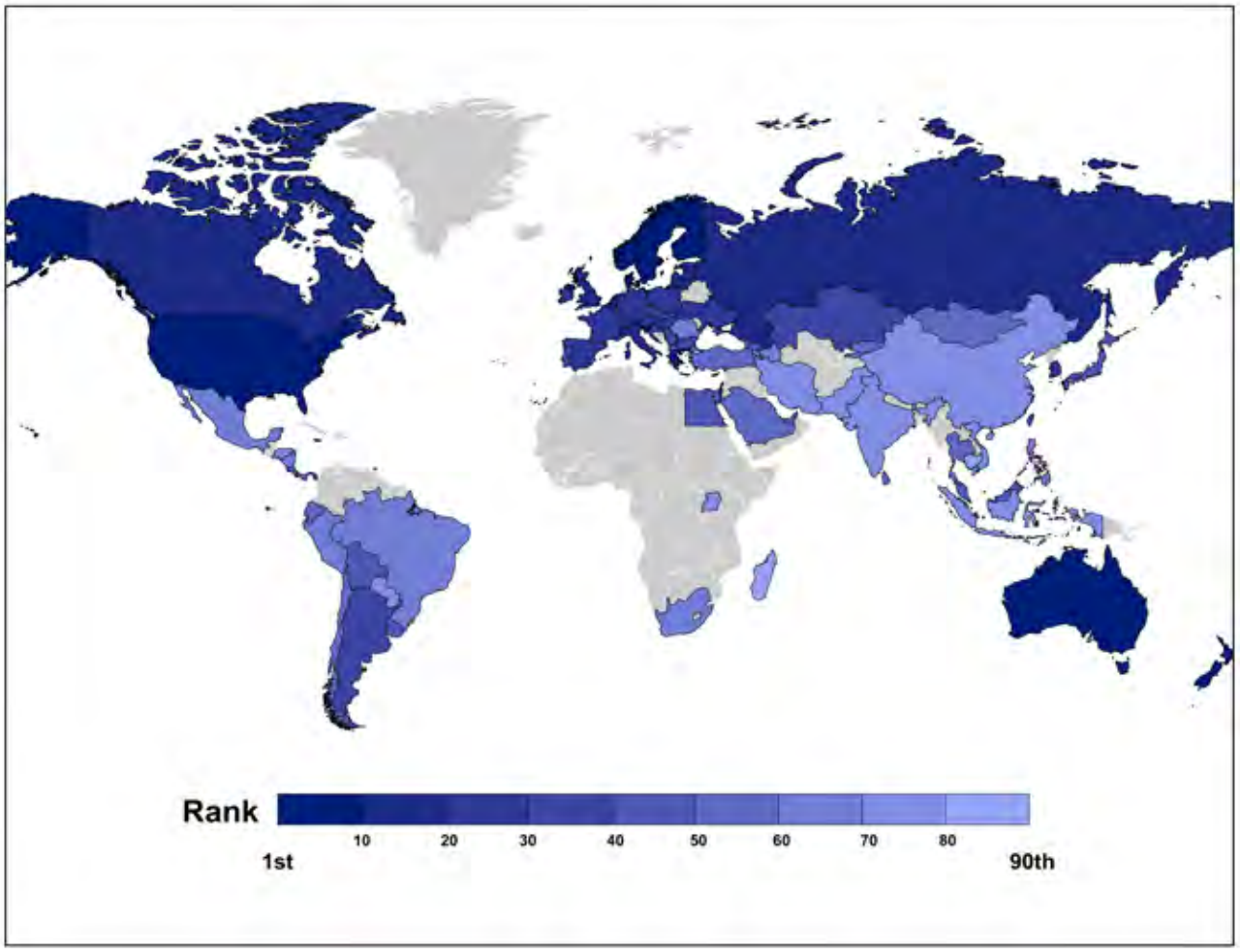
THE GLOBAL TOLERANCE MAPS

We now come to the third T, Tolerance. Courting divergent ideas and inputs isn't just a matter of political correctness—it's an economic growth imperative. Openness to different types of people and different lifestyles generally goes along with openness to different cognitive styles. Places that welcome diversity foster creativity.

We measure tolerance as a combination of two variables, both taken from the Gallup World Poll. The first is the percentage of respondents who believe that the city or area where they live is a good place for ethnic and racial minorities to live. The second is the

The global talent map

Exhibit 7



percentage that answers that the city or area where they live is a good place for gay and lesbian people to live. Previous research has shown that openness to gays and lesbians is associated with higher levels of both regional and national economic performance [22, 23].

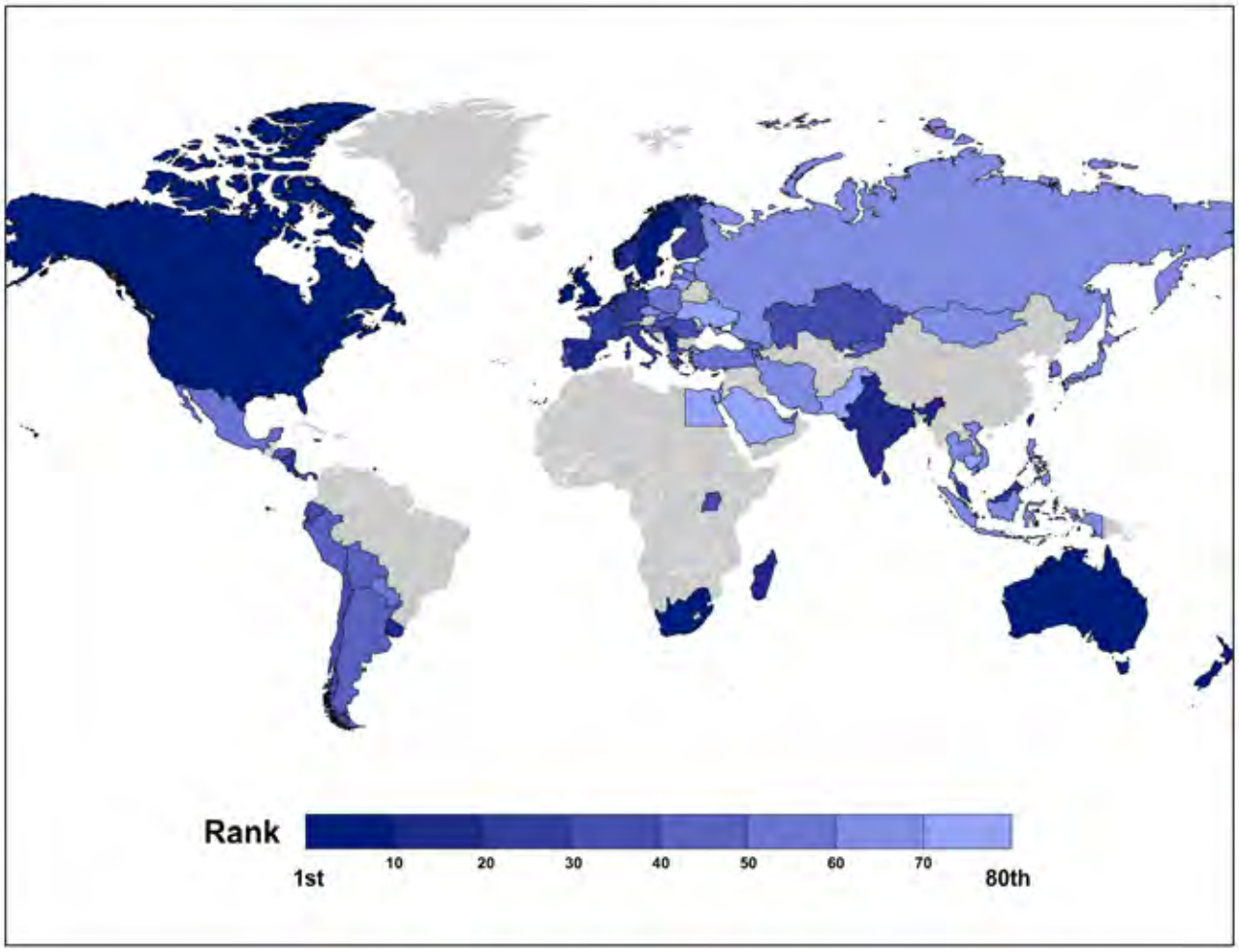
We begin with the global racial and ethnic openness map (**Exhibit 8**), which charts national rankings on openness to racial and ethnic minorities. Canada takes first place, with 91 percent of its residents surveyed reporting that their location is open to racial and ethnic minorities. New Zealand takes second spot with 87 percent, followed by Ireland (85 percent), Australia (84 percent), the United States (83 percent), Sweden, South Africa, and Singapore (81 percent), United Kingdom (79 percent), and Uruguay and Hong Kong (77 percent).

We now turn to the global openness to gays and lesbians map (**Exhibit 9**). The Netherlands takes the top spot, with 83 percent of residents surveyed reporting their location is a good place for gay and lesbian people. Canada is second (77 percent), followed by Spain (75 percent). Ireland and Uruguay are next (both with 70 percent). Belgium (67 percent), Australia and Sweden (66 percent), Denmark (65 percent), and the United Kingdom (63 percent) round out the top ten. The United States is found in 12th place.

The global tolerance map (**Exhibit 10**) plots how nations stack up on our overall Tolerance Index. Canada takes the top spot. Ireland ranks second. The Netherlands ranks third: it is the only country among the top five that is more open to gay and lesbian people (83%) than to racial and ethnic minorities

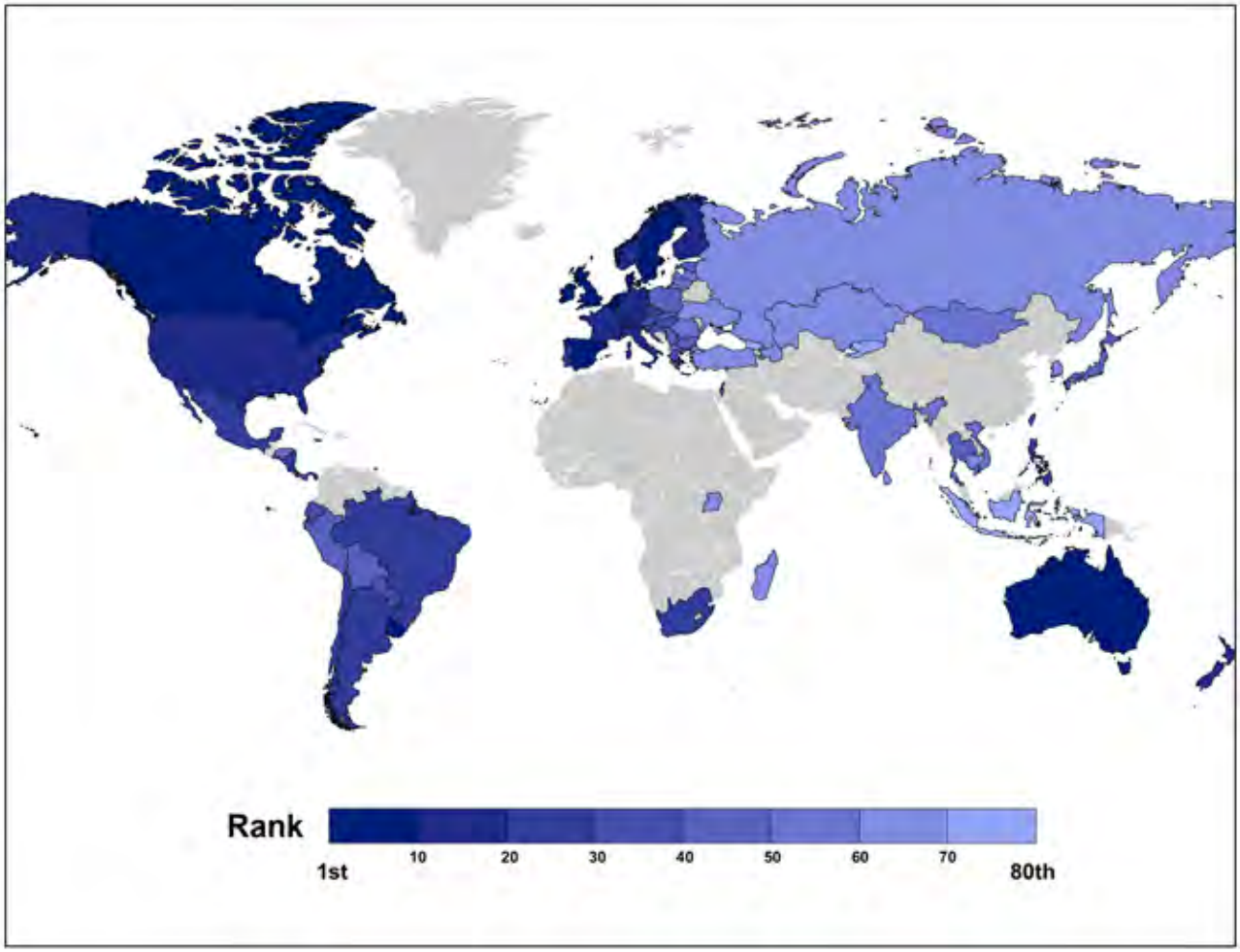
The global racial and ethnic openness map

Exhibit 8



The global openness to gays and lesbians map

Exhibit 9

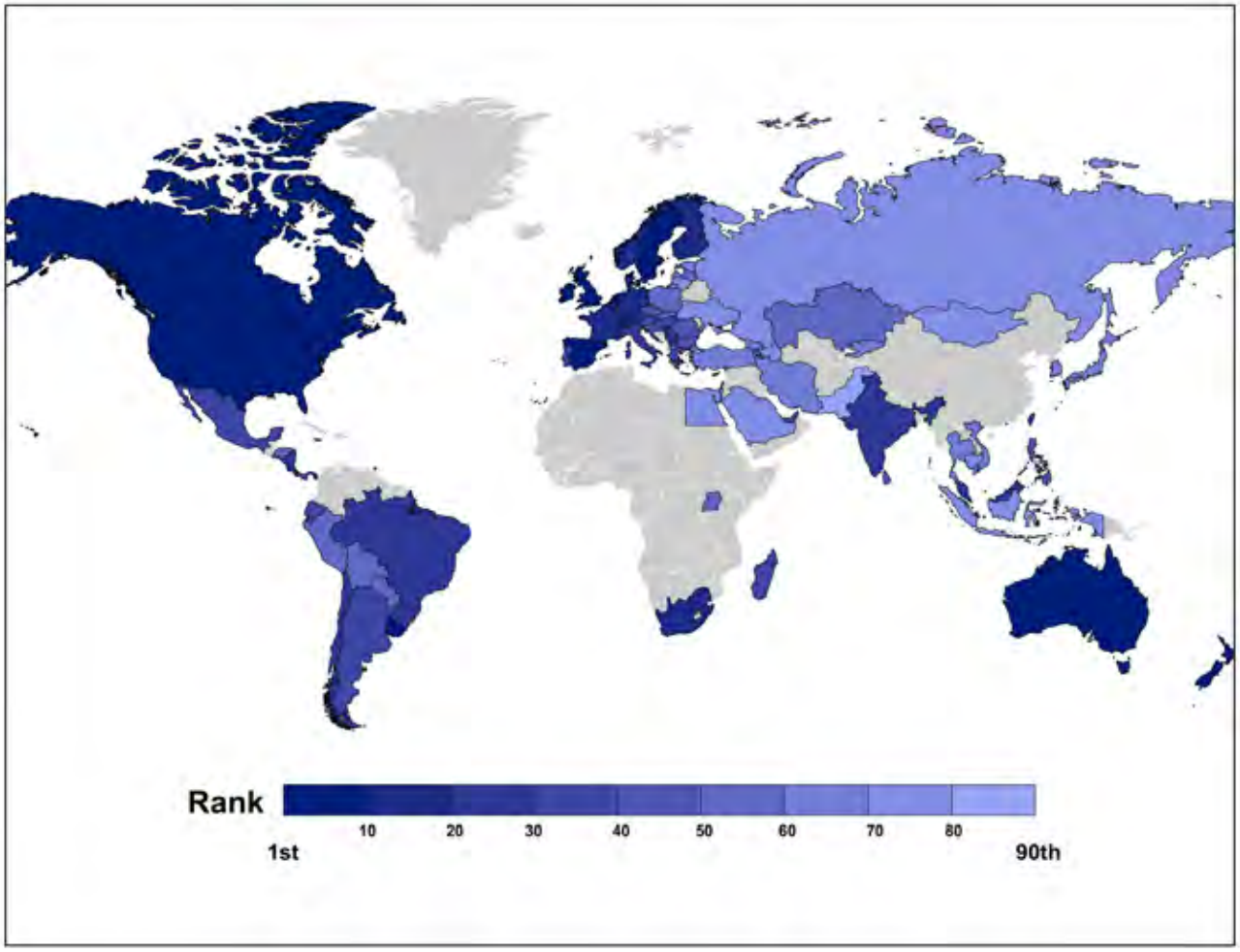


(73%). New Zealand ranks fourth, followed by nearby Australia in fifth place. Both have open immigration systems and have made it a priority to attract foreign talent. For example, Peter Jackson's Park Road Post film studio in Wellington has attracted not just movie makers but software experts, marketers, writers, musicians, and other creative people from all over the world.

Spain, where the Zapatero administration made tolerance and openness a priority, is in sixth place, followed by Sweden. The United States ranks eighth, perhaps reflecting recent increases in anti-immigrant sentiment and social conservatism toward gays and lesbians. Uruguay is in ninth place and the United Kingdom rounds out the top ten.

The global tolerance map

Exhibit 10



Global Tolerance—Uruguay

Located in the southern part of South America on the Atlantic coast between Brazil and Argentina, Uruguay, among the smallest countries on the continent, has been dubbed "The Switzerland of South America." It has earned this title for several reasons. The administrations of President Jose Batlle in the early 20th century established widespread political, social, welfare and economic reforms that established a socialist tradition. Its banking laws have many similarities to its Alpine cousin. The country has an eclectic society which showcases a rich European heritage, a broad variety of artistic and cultural attractions, and one of the most progressive educational systems in the region. While many Uruguayans identify themselves as "white," their lineages include Spanish, Portuguese, Italian, Mestizo, Amerindian, and African-Uruguayan elements. Spanish is the official national language, although Portuguese, Brazilero (a Spanish-Portuguese mix), English, French, German, and Italian are spoken widely in the Montevideo metropolitan area. While representing less than 1% of the total population, Jews, mostly in Montevideo, make up one of the largest Jewish communities in South America. Half of the country's population lives in Montevideo, and 92% of the country's population is living in an urban area. Uruguay is popular among travelers from the Western Hemisphere and Europe.

https://www.cia.gov/library/publications/the-world-factbook/geos/uy.html

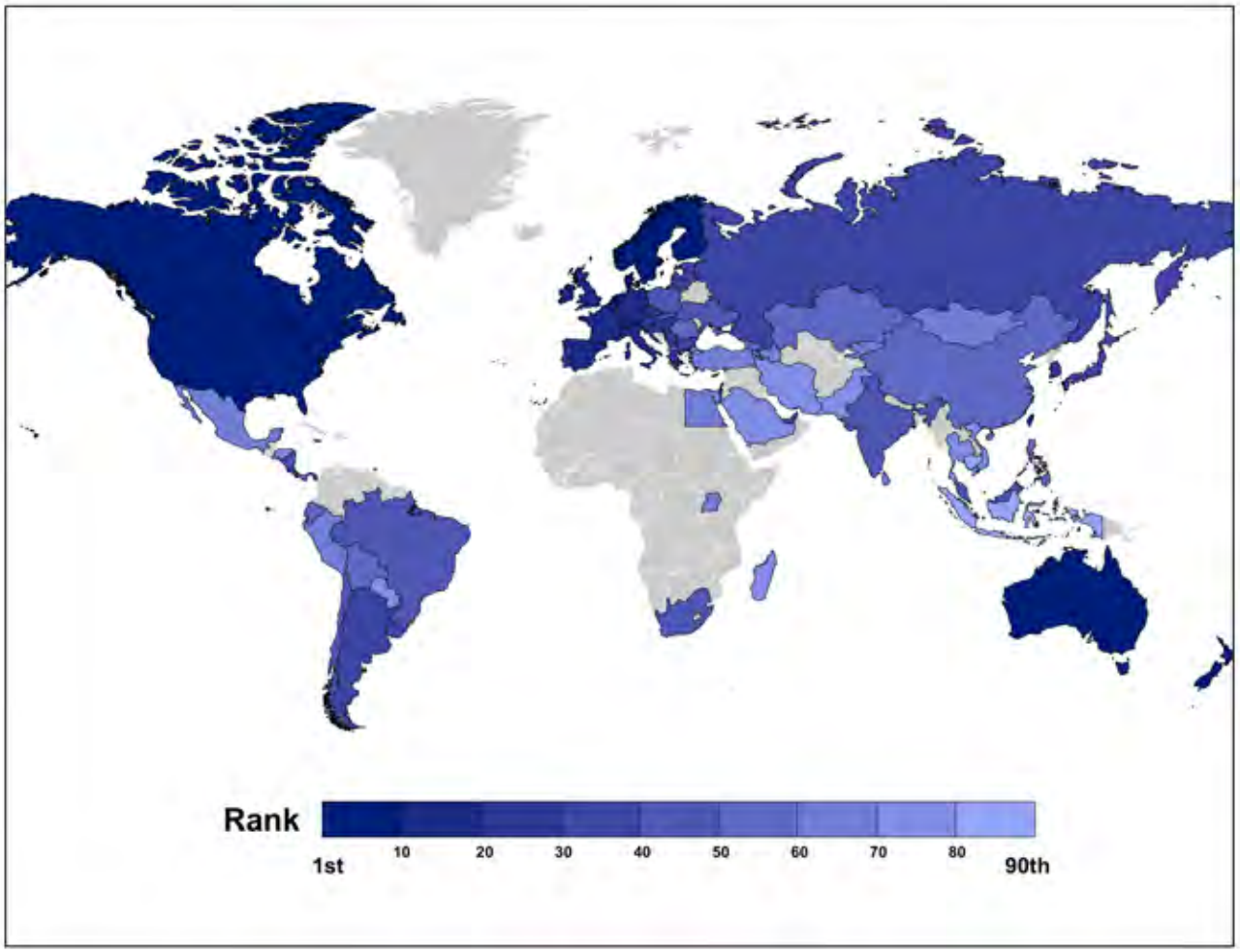
THE GLOBAL CREATIVITY INDEX MAP—BRING IT ALL TOGETHER

We now bring it all together. The Global Creativity Index map (**Exhibit 11**) combines all of the previous 3 T measures into one overarching metric of a nation's long-term creativity and prosperity potential.

Sweden takes first place overall, maintaining the top position it held in the 2004 edition of the GCI. The United States takes second place, improving its earlier fourth place finish. Finland takes third place, followed by Denmark in fourth, Australia in fifth, and New Zealand in sixth place. Canada takes seventh place together with Norway. Singapore and the Netherlands round out the top ten. Rounding out the top twenty are Belgium, Ireland, the United Kingdom, Switzerland, France, Germany, Spain, Taiwan, Italy, and Hong Kong. Israel ranks 25th. Of the BRIC nations, Russia ranks highest on the GCI, at 31st, followed by Brazil in 46th, India in 50th, and China in 58th place.

We have now seen how nations stack up on each of the 3 Ts of economic development and on the GCI. But how do these scores relate to economic growth and competitiveness, and to broader measures of happiness, well-being, human development, and longer-run prosperity? We turn to this issue next.

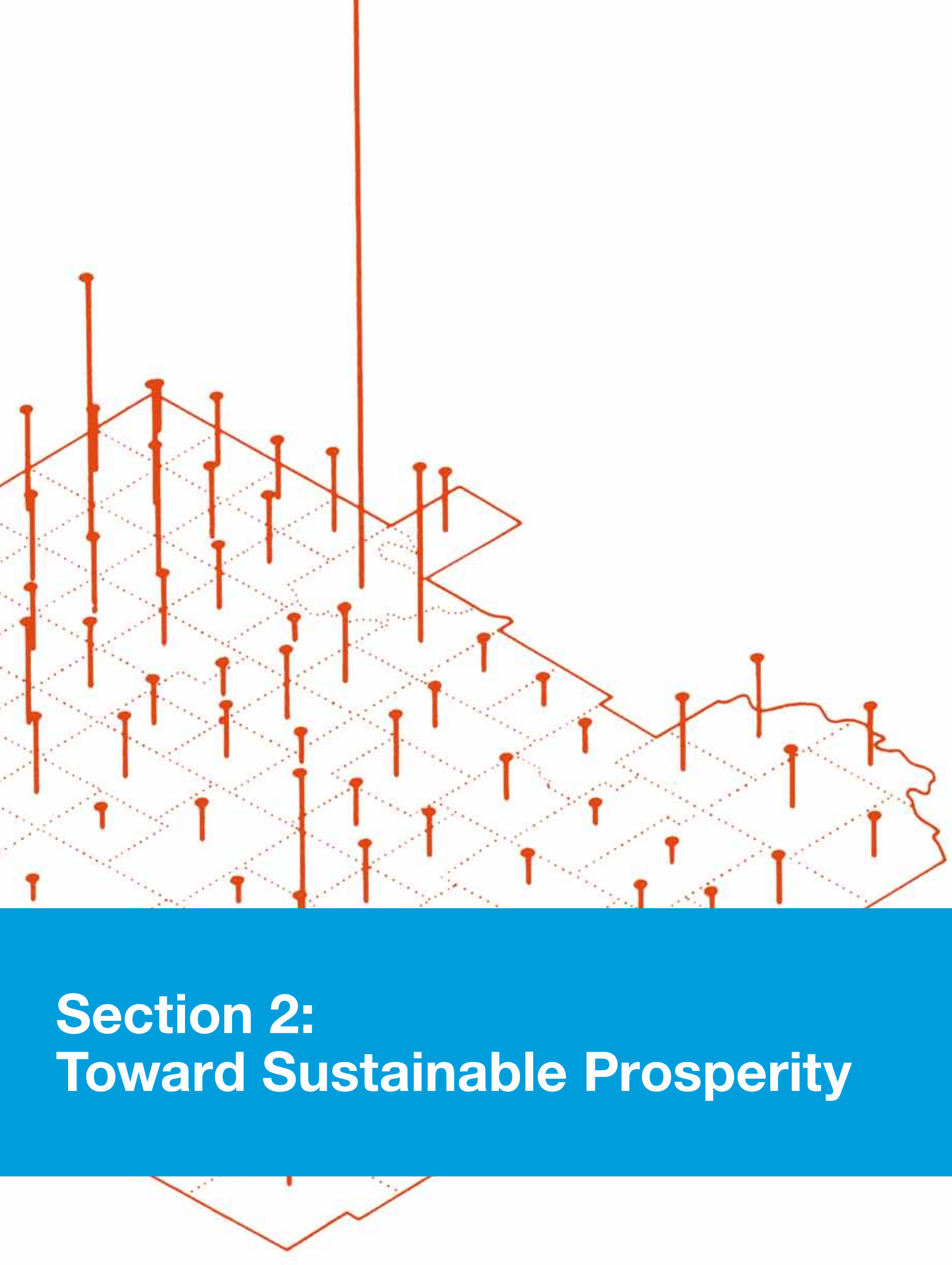
The Global Creativity Index map — Exhibit 11



Top 25 overall Global Creativity Index rankings

Exhibit 12

TOTAL RANK	COUNTRY	TECHNOLOGY	TALENT	TOLERANCE	GLOBAL CREATIVITY INDEX
1	Sweden	5	2	7	0.923
2	United States	3	8	8	0.902
3	Finland	1	1	19	0.894
4	Denmark	7	4	14	0.878
5	Australia	15	7	5	0.870
6	New Zealand	19	5	4	0.866
7	Canada	11	17	1	0.862
7	Norway	12	6	11	0.862
9	Singapore	10	3	17	0.858
10	Netherlands	17	11	3	0.854
11	Belgium	16	12	13	0.813
12	Ireland	20	21	2	0.805
13	United Kingdom	18	19	10	0.789
14	Switzerland	6	22	20	0.785
15	France	14	23	16	0.764
15	Germany	9	26	18	0.764
17	Spain	24	28	6	0.744
18	Taiwan	—	32	21	0.737
19	Italy	26	18	23	0.707
20	Hong Kong	22	37	12	0.691
21	Austria	13	30	35	0.663
22	Greece	38	9	37	0.638
22	Slovenia	23	10	51	0.638
24	Serbia	28	35	27	0.614
24	Israel	4	20	66	0.614



Section 2:
Toward Sustainable Prosperity

The economic crisis has brought us face-to-face with the fact that unbridled economic growth does not necessarily equal sustainable prosperity. Economists have been seeking fuller frameworks and better metrics with which to evaluate the underpinnings as well as the path to longer-run, more sustainable prosperity. This report is in line with this broader effort. In that light, we now examine the relationships between our measure of underlying creativity, the GCI, and a series of measures of economic and social progress. We structure our inquiry around four key questions.

- *Are more creative societies also more productive and competitive?*
  Here we look at the association between the GCI and standard measures of economic output and competitiveness, like gross domestic product and the World Economic Forum's Global Competitiveness Index.
- *Are creative societies more or less equal than their counterparts?*
  Here we look at the relationship between the GCI and measures of socio-economic inequality.
- *Are more creative nations associated with higher levels of human development more generally?*
  Here we compare the GCI to a broad measure of human development, the United Nation's Human Development Index.
- *Do more creative nations generate higher levels of happiness for their residents?*
  To get at this we examine the relationship between the GCI and a comprehensive measure of global happiness or subjective well-being provided by the Gallup Organization's World Poll.

THE GCI AND ECONOMIC OUTPUT

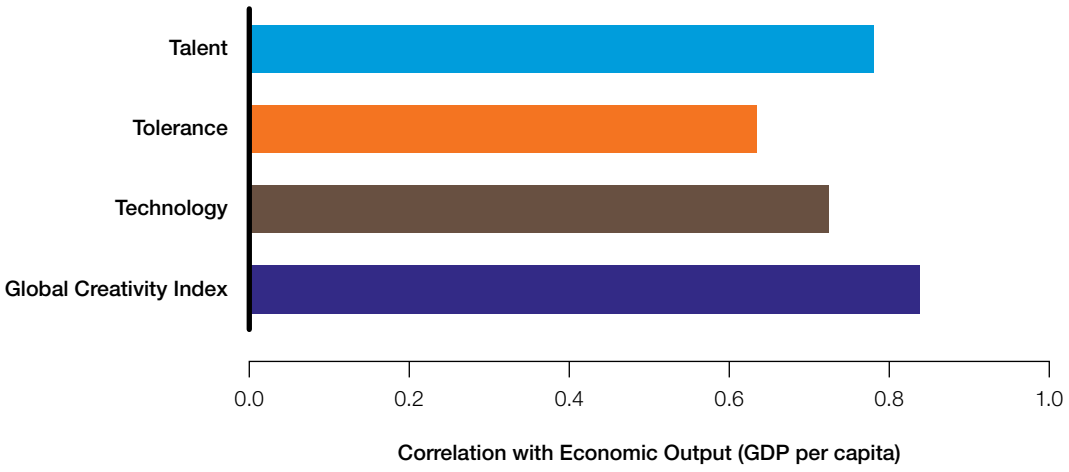
Let's begin with the relationship between global creativity and the standard measure of economic output—gross domestic product per capita. The figure below (**Exhibit 13**) shows the correlation between the GCI and each of the measures for the 3 Ts.

With a correlation of 0.84, the GCI is closely associated with gross domestic product per capita. Of the 3 Ts, talent has the strongest relationship to GDP (0.78), followed by technology (0.72), and tolerance (0.63). It is interesting that when the three are combined in the GCI the correlation is considerably stronger (0.84). This shows how the 3 Ts work together and how nations scoring high in all three enjoy higher material standards of living.

Exhibit 14 shows the broad relationship between the GCI and gross domestic product per capita. The line fits extremely well; there are only a few extreme outliers at the top and the bottom of the chart. Clearly, the relationship between the GCI and gross domestic product per capita is quite close.

Nations above the fitted line have higher gross domestic product per capita than their GCI scores would predict, while those below the line have lower economic output than predicted. On the one hand, the United States, Norway, Switzerland, Japan, Hong Kong, the United Kingdom, Israel, Austria, Germany, and Korea all have levels of gross domestic product per capita which are slightly higher than their GCI scores would predict. On the other hand, Canada, the Netherlands, Finland, Australia, and

The GCI and economic output (correlations) — Exhibit 13



New Zealand have levels of gross domestic product per capita which are slightly lower than their GCI scores would seem to warrant. Perhaps more significantly, very low GCI scores appear to be associated with even lower levels of economic output per capita, as the cases of Nicaragua, Mongolia, Kyrgyzstan, Uganda, and Madagascar indicate.

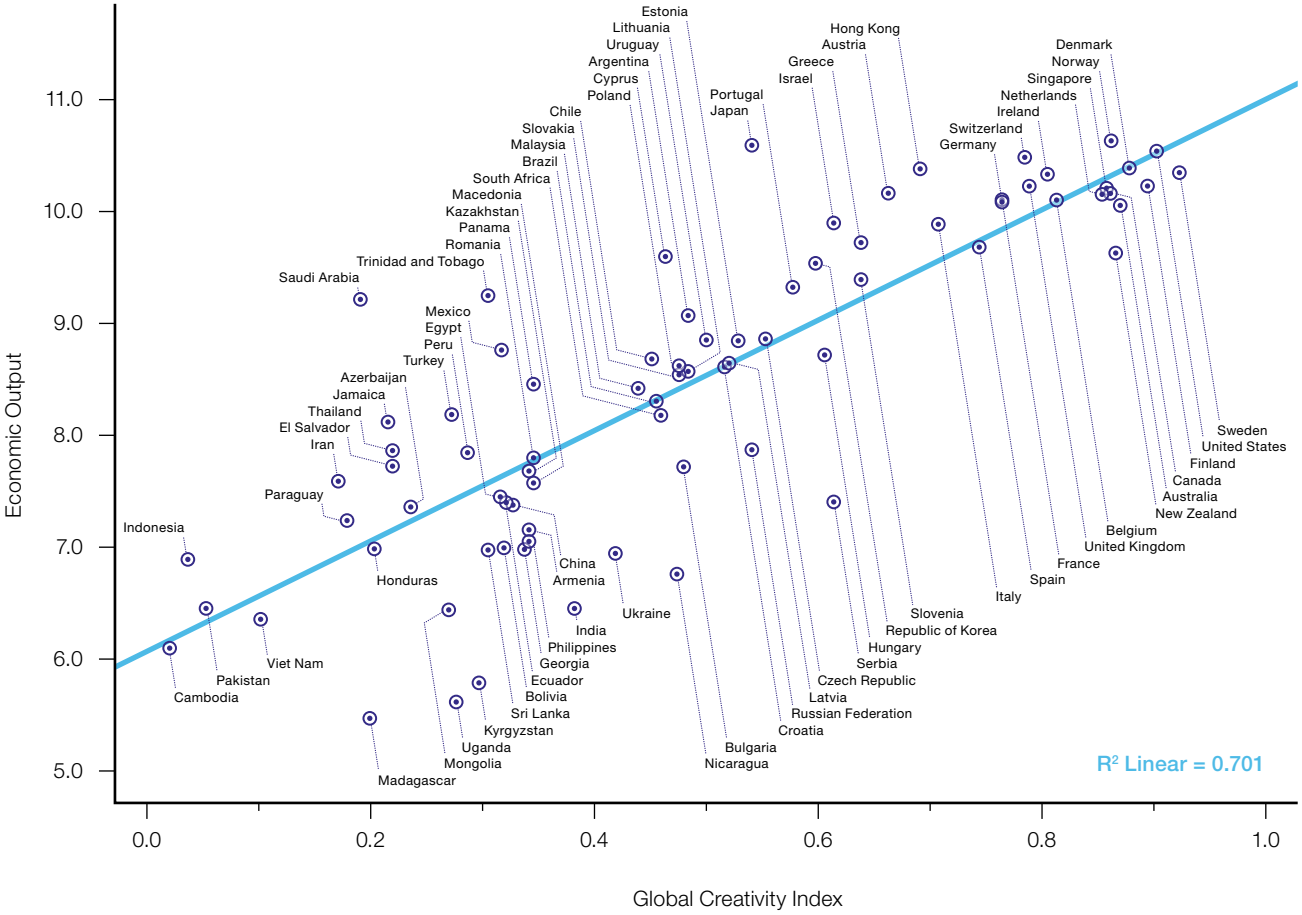
THE GCI AND ECONOMIC COMPETITIVENESS

We now turn to the relationship between the GCI and a well-established measure of global competitiveness—the Global Competitiveness Index developed by Harvard professor Michael Porter for the World Economic Forum. The Global Competitiveness Index is a comprehensive measure of overall competitiveness and included factors associated with economic output, innovation, efficiency, and business climate among others [24].

Exhibit 15 shows the correlation between the Global Competitiveness Index and the GCI, as well as each of our 3 T indices. The GCI is closely associated with the Global Competitiveness Index (with a correlation of 0.79). The correlations are also substantial for each of the 3 Ts—led by Technology (0.82), then Talent (0.66), and Tolerance (0.59).

Exhibit 16 shows the broad relationship between the GCI and the Global Competitiveness Index. Though still fairly strong, the relationship between the GCI and the Global Competiveness Index is not as pronounced as it is with gross domestic product per capita—there is more "scatter" about the line. On the one hand, the United States, Singapore, Switzerland, the United Kingdom, Japan, Hong Kong, Germany, and Denmark all perform

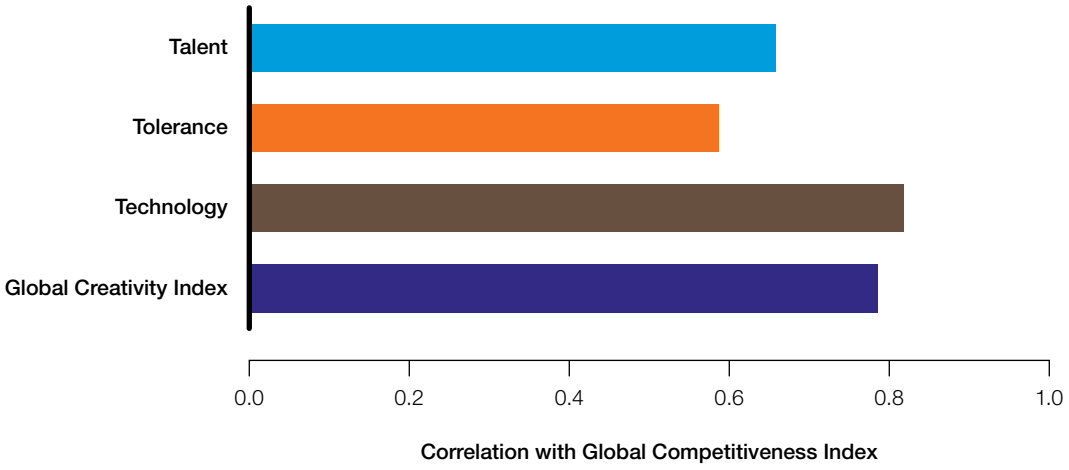
The GCI and economic output — Exhibit 14



Note: Economic Output measured as log of gross domestic product per capita.

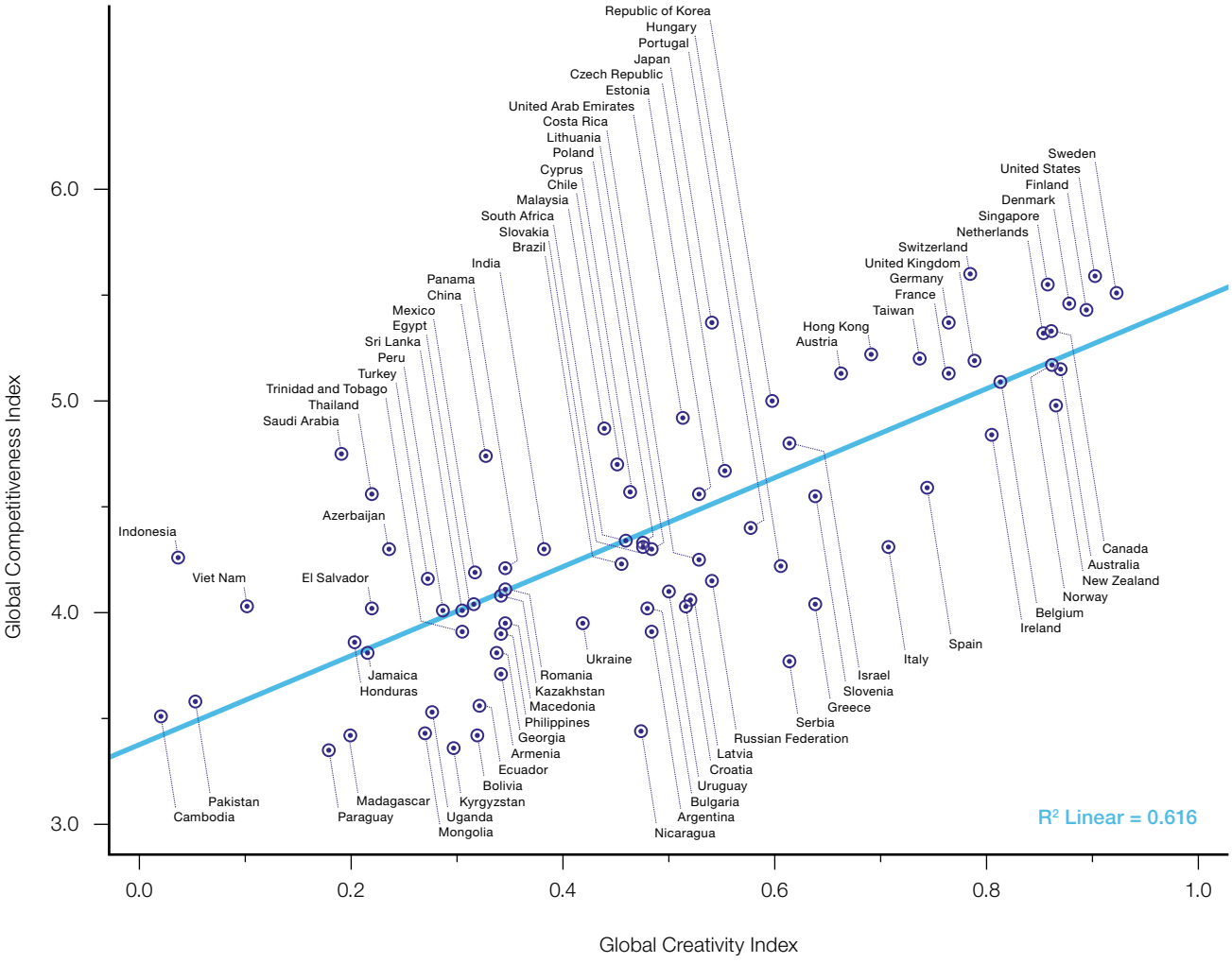
The GCI and global competitiveness (correlations)

Exhibit 15

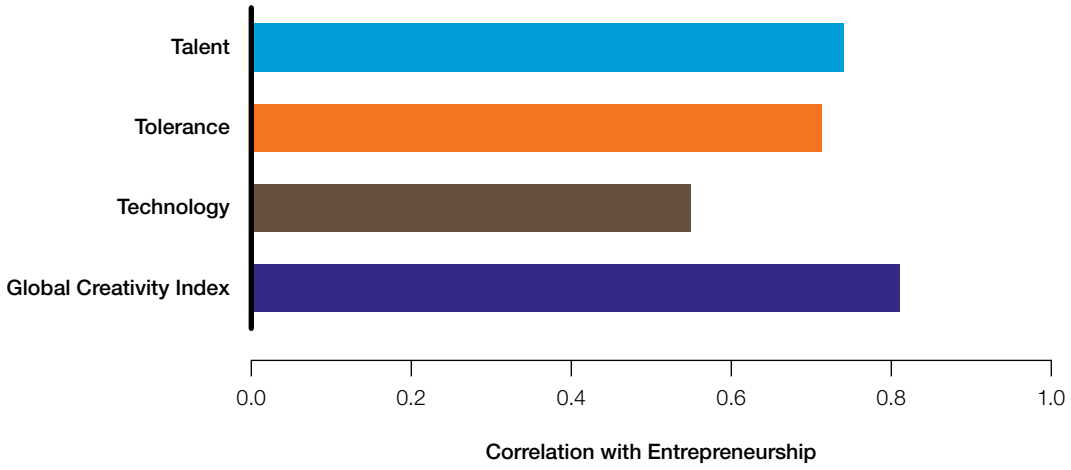


The GCI and global competitiveness

Exhibit 16



The GCI and entrepreneurship (correlations) Exhibit 17



better in terms of competitiveness than their GCI scores would lead one to expect. Canada performs just slightly better than its GCI scores predict. China and India both perform significantly better on competitiveness than their GCI scores suggest they should. On the other hand, New Zealand, Ireland and Spain perform lower on competitiveness than their GCI scores would seem to predict.

THE GCI AND ENTREPRENEURSHIP

Joseph Schumpeter long ago showed how innovation and entrepreneurship come together to set in motion the "creative destruction" that drives economies forward. Some 20 percent of the Fortune 500 companies were founded in the last thirty years, including Google, Microsoft, Apple, and Amazon. Entrepreneurship is an integral component and a key driver of economic growth and prosperity.

To get at this, we employ a new measure: the Global Entrepreneurship Index, which covers 54 nations worldwide [25]. The index shows the wide disparity in entrepreneurial activity across the nations of the world. Canada, Israel, and the United States have the highest levels of entrepreneurial activity, while Denmark, Finland, France, Germany, and Japan have the lowest. One in every twelve workers in the United States is involved in a start-up company, as compared to fewer than one in 67 persons in Finland, according to the study.

Exhibit 17 shows the correlation between the Global Entrepreneurship Index and the GCI as well as each of our 3 T indices. Of the 3 Ts, Talent has the strongest relationship to the Global Entrepreneurship Index (0.74), followed by Tolerance (0.71), and Technology (with a weaker correlation of 0.55). The correlation

The Global Entrepreneurship Monitor

The Global Entrepreneurship Monitor (GEM) is a not-for-profit academic research consortium whose goal is making high quality information on global entrepreneurial activity available to as wide an audience as possible. GEM is the largest single study of entrepreneurial activity in the world. Started as a partnership between London Business School and Babson College, it was initiated in 1999 with 10 countries. GEM 2010 is currently conducting research in 59 countries. The research program, based on a harmonized assessment of the level of national entrepreneurial activity for all participating countries, involves exploring the role of entrepreneurship in national economic growth. Systematic differences continue, with few highly entrepreneurial countries reflecting low economic growth. There is, further, a wealth of national features and characteristics associated with entrepreneurial activity. The program creates both individual national papers and an annual global report. Over 120 scholars and researchers are actively participating in the GEM project.

http://www.gemconsortium.org

for the overall GCI (0.81) is the strongest, again showing the combined strength of the 3 Ts working together.

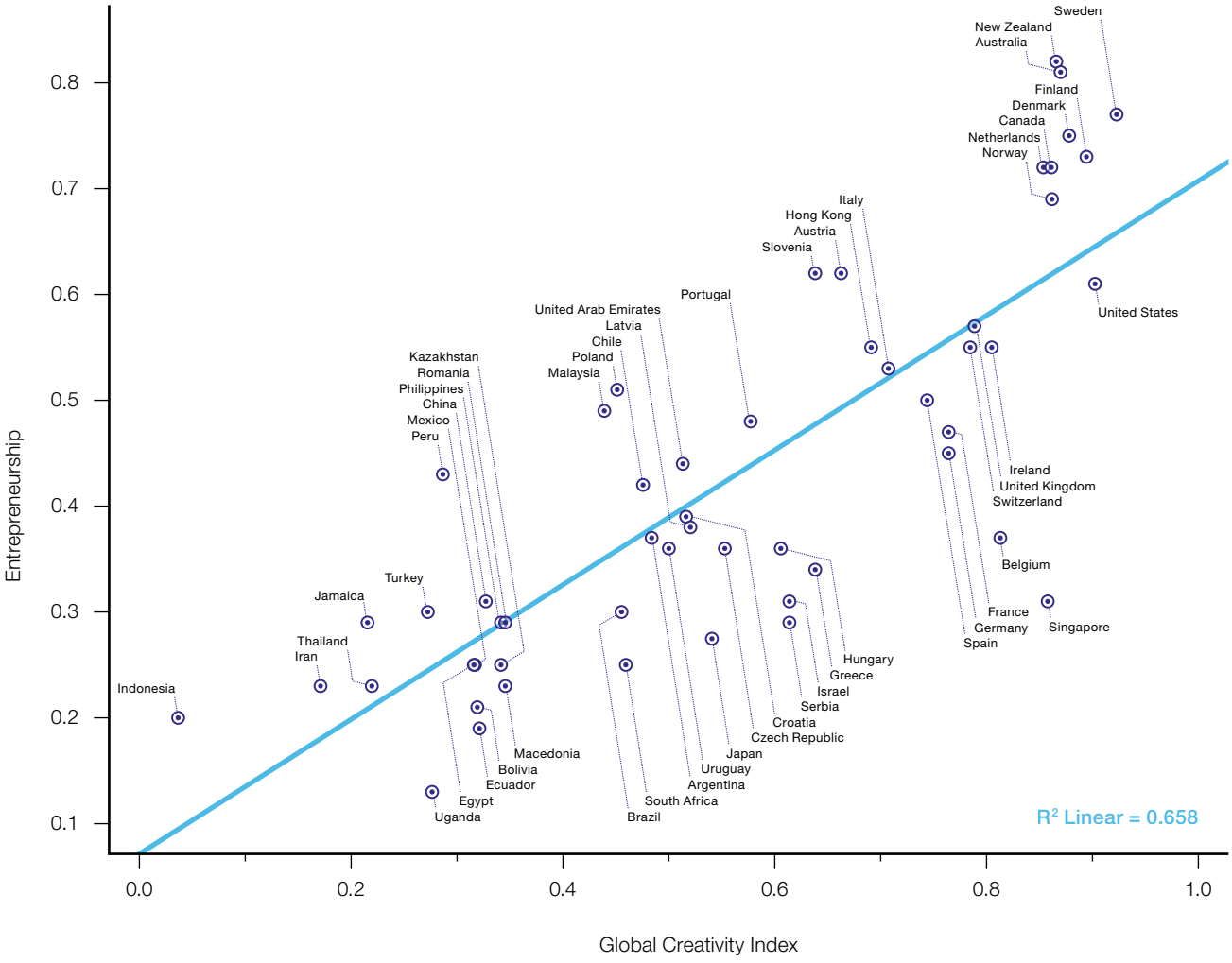
Exhibit 18 shows the broad relationship between the GCI and the Global Entrepreneurship Index. The fit is good but there are a large number of countries above and below the line. On the one hand, New Zealand, Australia, Sweden, Denmark, the United Kingdom, and Hong Kong all perform better on the Global Entrepreneurship Index than their GCI scores would predict. Canada is just slightly above the fitted line, while the United States, perhaps surprisingly, is just below it. On the other hand Germany, France, Belgium, and Singapore have lower levels of entrepreneurial activity than the GCI would predict.

THE GCI AND INEQUALITY

We now turn to the relationship between global creativity and inequality. Some would argue that the shift to a creative knowledge-based economy exacerbates levels of inequality. High-paying, family supporting manufacturing jobs have declined and the labor market has split into higher-pay, higher-skill knowledge and professional jobs on the one hand, and lower-pay, lower-skill service jobs on the other. A series of studies documents the growth in income inequality in the United States. According to data from the Congressional Budget Office released in June, 2010, average after-tax incomes for the top one percent of American households rose by 281 percent between 1979 and 2007. This compares to increases of 25 percent for the middle fifth of households and 16 percent for the bottom fifth (all figures are adjusted for inflation) [26].

The GCI and entrepreneurship

Exhibit 18



But is this the case across nations? Does increasing creativity necessarily lead to increased economic inequality? To get at this, we examine the relationship between the GCI and a standard measure of income inequality—the Gini Index.

Exhibit 19 shows the relationships between income inequality and the GCI overall as well as each of the 3 T indices that comprise it. While this may come as a surprise for those familiar with the case of the United States, we find that the GCI is in fact systematically associated with *lower* levels of socio-economic inequality—and hence greater equality—across the nations of the world.

Each and every one of the correlations between the GCI and the Gini is negative. The correlation between inequality and the overall GCI is –0.43. The Gini is also quite negatively associated with Technology (–0.47) and Talent (–0.52) but much less so with Tolerance (–0.06 and not statistically significant). This last is a bit surprising as one might expect more tolerant societies to be more equal on balance. That said, we believe the overall finding of a negative association between creativity and inequality to be an important one, for it implies that the general trajectory of economic development is associated with lower levels of inequality.

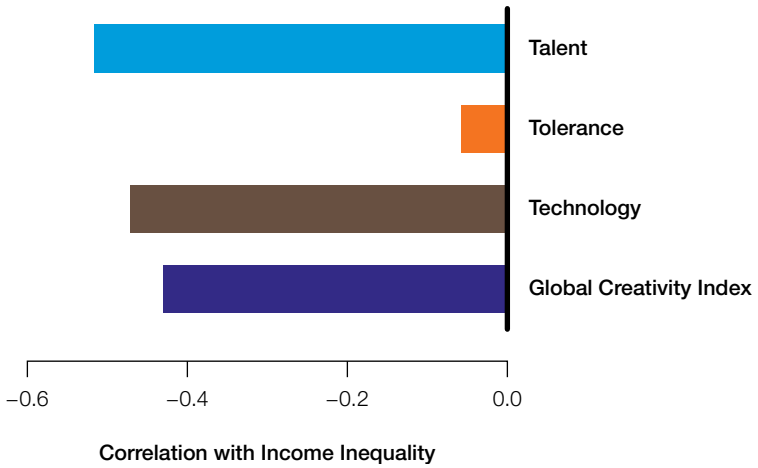
Exhibit 20 is a scatter-graph which plots the association between the Gini measure of income inequality and the GCI for the nations of the world. The fit is not especially good and there are lots of countries above and below the line. This suggests that there are two distinctive paths for high creativity countries. On the one hand, there are countries like the United States, the United Kingdom, Singapore, and to a lesser extent, Australia and New Zealand, where high levels of creativity, productivity and economic competitiveness go hand in hand with higher levels of inequality. But there are also a substantial number of countries where high levels of creativity, competitiveness and productivity combine with much lower low levels of inequality. These are largely Scandinavian and Northern European countries, including Sweden, Denmark, Finland, Norway, the Netherlands, and Germany. Japan is represented as well. Among the less developed nations, we find high levels of inequality in South American nations like Paraguay, Bolivia, Panama, Brazil, Honduras, Ecuador, and Argentina. Of the BRIC nations, China, Russia and particularily Brazil all exhibit much higher levels of inequality than their GCI scores would predict.

There appears to be two distinct paths available to high creative development: for every high-creativity, high-inequality nation there is a high-creativity, low-inequality counterpart. This is a likely reflection of these countries' differing levels of social welfare. Though more systematic study is needed before we can draw any firm conclusions, this finding gives us reason for optimism; at the same time, it suggests that sustainable, long-term prosperity requires a significant investment in education and skill development. This is the topic to which we now turn.

THE GCI AND HUMAN DEVELOPMENT

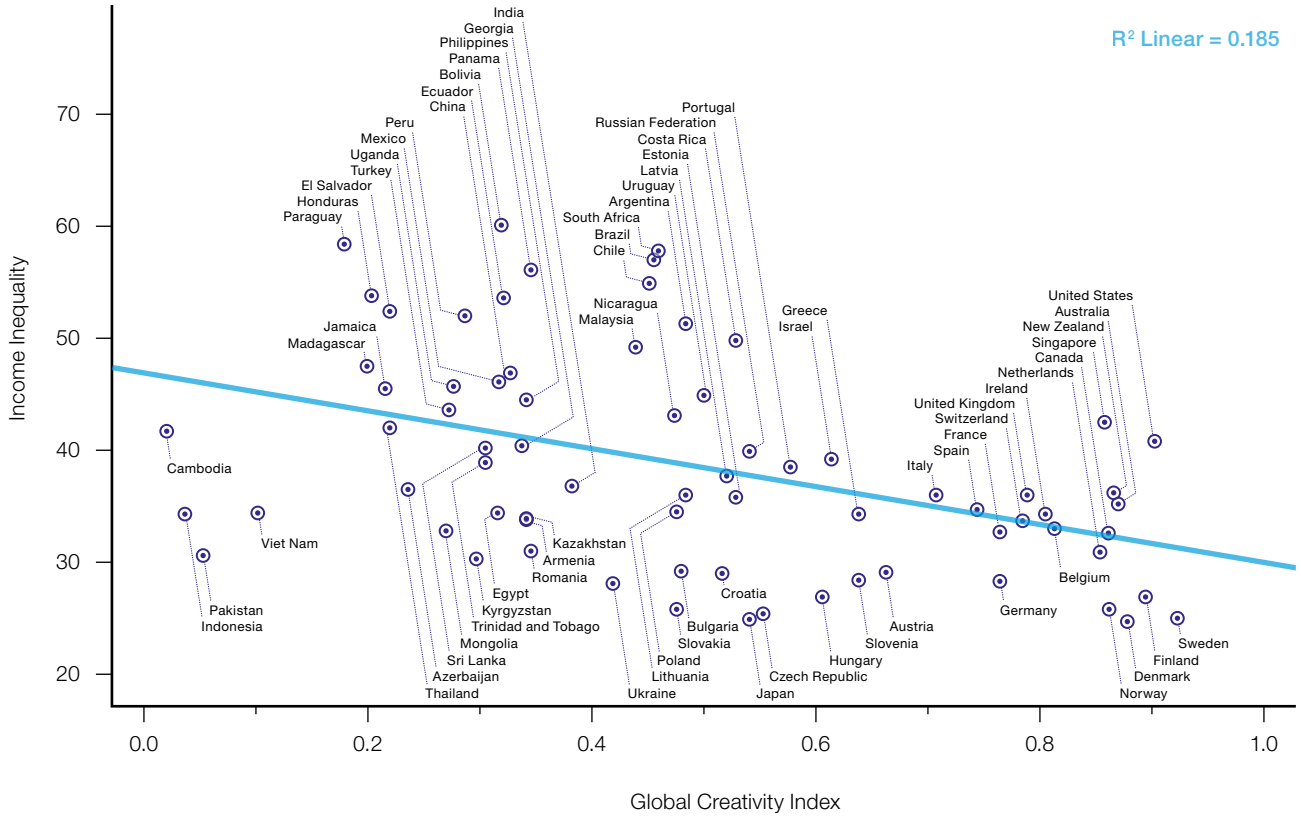
What is the connection between creativity and human development? To get at this, we explore the association between the GCI and the United Nations' Human Development Index [27]. "People often value achievements that do not show up at all, or not immediately,

The GCI and inequality (correlations) — Exhibit 19



The GCI and income inequality

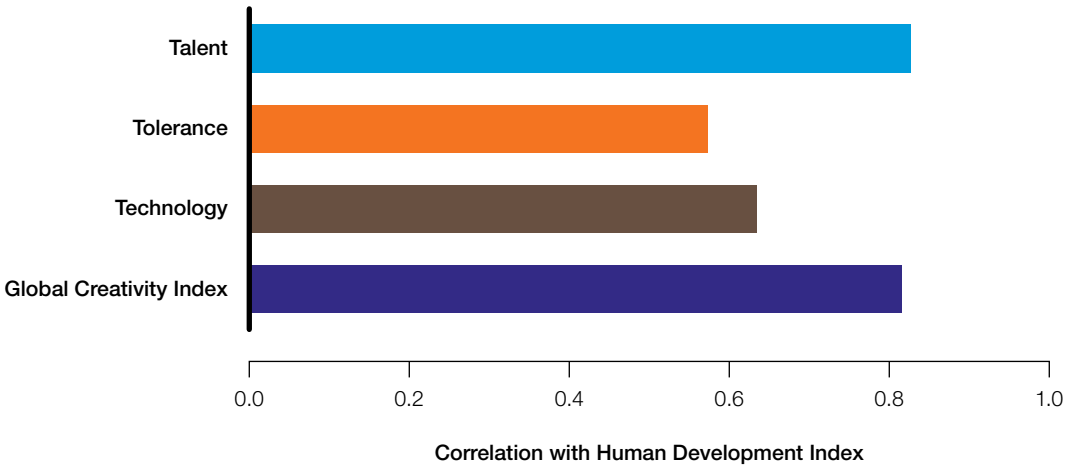
Exhibit 20



Note: Income Inequality measured as a Gini Index.

The GCI and human development (correlations)

Exhibit 21



in income or growth figures," wrote Mahub ul Haq, founder of the UN Human Development Report [27]. The UN Human Development Index takes a wide variety of human development factors into account, from health conditions and life expectancy to education levels and standards of living.

Exhibit 21 shows the associations between the Human Development Index and the GCI, as well as each of the 3 T indices that comprise it. The overall GCI is closely associated with the Human Development Index (the correlation is 0.82). Since the Human Development Index includes a measure of education, we would expect it to be strongly associated with our talent index (and it is, with a correlation of 0.83). But it is also correlated with technology (0.63) and tolerance (0.57).

Exhibit 22 plots the GCI against the Human Development Index for the nations of the world. The fit is good, with outliers mainly at the lower left hand quadrant of the graph—among the least developed nations of the world.

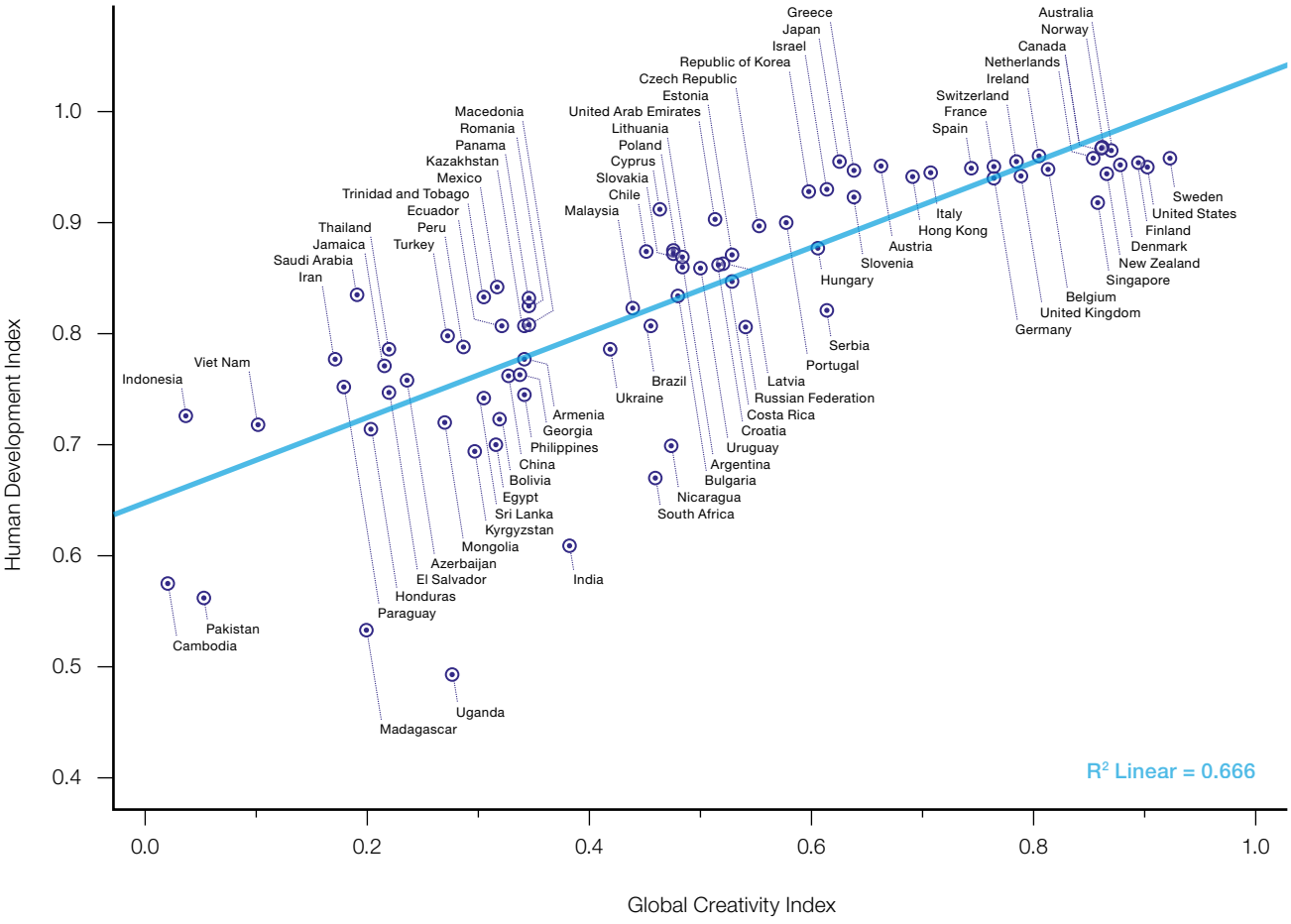
The United States performs considerably less well on the Human Development Index than its GCI score would predict; Canada performs slightly better. Of the BRICs, India performs significantly worse on Human Development Index than its GCI score would seem to warrant. Four less-developed nations—Cambodia, Pakistan, Madagascar, and Uganda—lag significantly on Human Development when their GCI score is taken into account.

THE GCI AND HAPPINESS

This leads us to a final question: What is the relationship between global creativity and overall happiness? There is considerable ongoing debate concerning the relationship between economic development and subjective well-being. Much of this debate has revolved around the effects of money or material well-being on happiness. It was initially found that the relationship between income and happiness only holds within, and

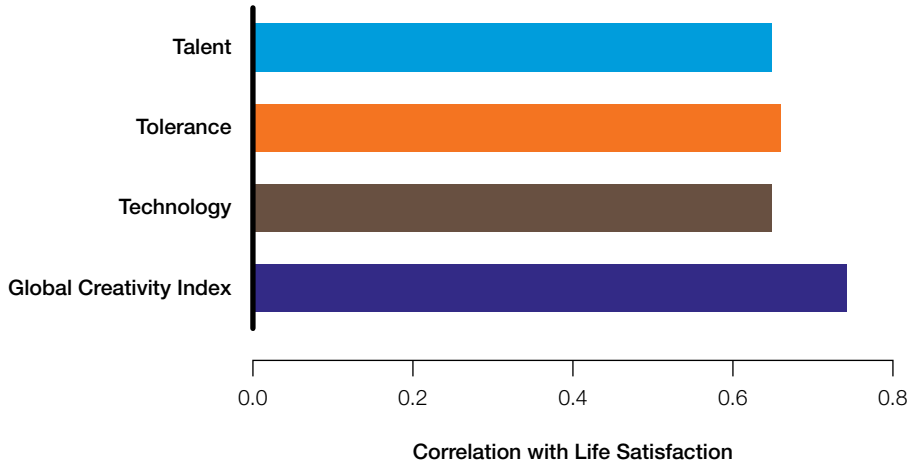
The GCI and human development

Exhibit 22



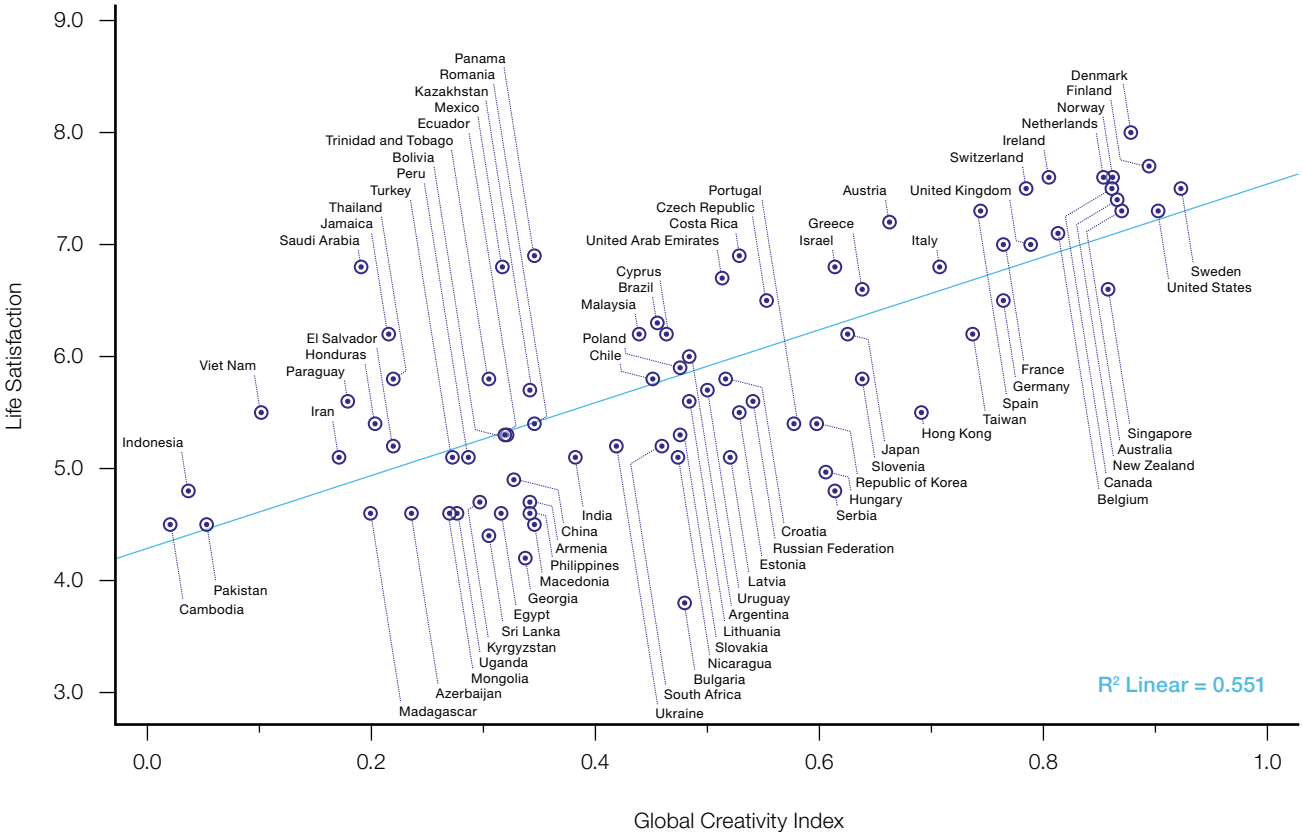
The GCI and happiness (correlations)

Exhibit 23



The GCI and happiness

Exhibit 24



not across countries, the so-called "Easterlin effect" [28]. More recent econometric studies by Angus Deaton [29] and Betsey Stevenson and Justin Wolfers [30], based on new data collected worldwide by the Gallup Organization, have challenged this view, finding that income exerts strong effects on happiness across the board. Carol Graham seeks to square this analytical circle, calling attention to the paradox of the "happy peasant and the miserable millionaire," suggesting that while people can adapt to be happy at low levels of income, they are far less happy when there is uncertainty over their future wealth [31, 32]. Some have gone so far as to suggest that life satisfaction and well-being be utilized to supplement more conventional measures of economic output like Gross Domestic Product. John Helliwell [33, 34], Joseph Stiglitz [1], Ed Diener [35], and Rafael Di Tella and Robert MacCulloch [36], among others, have made the case for a measure of Gross National Happiness.

We examine the relationship between the GCI and a comprehensive measure of happiness and life-satisfaction collected by the Gallup Organization's World Poll [37]. The World Poll covers roughly 150 nations and measures life satisfaction using a standard set of core questions which ask individuals to rank their satisfaction with aspects of their life in real time.

Exhibit 23 shows the associations between well-being or life satisfaction and the overall GCI as well as the 3 T indices that comprise it. Life satisfaction is approximately equally related to all 3 Ts, with only a slightly stronger relation to Tolerance (0.66), followed by Talent (0.65) and Technology (0.65). The overall GCI is closely associated with life satisfaction (a correlation of 0.74). Once again, we note that the association is considerably stronger when the 3 Ts are combined into the overall GCI measure. This again illustrates the power of the 3 Ts working together to condition higher levels of life satisfaction and well-being.

Exhibit 24 plots the GCI against life satisfaction. The fit is reasonably good, with outliers mainly at the bottom quadrants of the graph—that is, among the less developed nations. The relationship between the GCI and life satisfaction is strongest among the more advanced nations. Denmark, Finland, the Netherlands, Ireland, Switzerland, New Zealand, and Canada have higher levels of life satisfaction than their GCI scores would predict. The United States has a level of life satisfaction that is roughly in line with its GCI score. Singapore, the United Kingdom, Taiwan, Hong Kong, and Korea have lower levels of life satisfaction than their GCI scores would predict. Among the BRICs, Brazil has a significantly higher level of life satisfaction than its GCI score would predict, while Russia's is considerably lower. Both India and China have lower levels of life satisfaction than the GCI would predict.

CONCLUSION

In the wake of the economic crisis of 2008, economists have been rethinking conventional conceptions of economic growth—not only how best to measure it but what exactly it is. Though the challenges of job creation and the restoration of competitiveness remain high on most policy-makers' agendas, broader questions about how best to foster long-run, sustainable prosperity while addressing the issue of economic inequality are also of vital importance.

To get at this, we have examined 82 nations through the lens of the Global Creative Index (GCI), which reflects three key factors that shape long-run economic prosperity: Technology, Talent, and Tolerance. Then we systematically examined the relationship between the GCI and a series of measures of economic and social progress, including conventional measures of economic output and competitiveness and broader measures of inequality, human development, and happiness.

Sweden takes first place on the GCI. The United States is second, followed by Finland, Denmark, and Australia. Canada ranks eighth. New Zealand, Norway, Singapore, and the Netherlands round out the top ten. There have been some notable changes in rankings since our initial version of the GCI in 2004. Though Sweden retains its place at the top of the list, the United States has moved up to the second position from fourth, Australia has moved from twelfth to fifth, New Zealand from 18th to sixth, and Canada from 11th to eighth.

What's most notable is that four of the top ten positions are occupied by Scandinavian countries. Australia and New Zealand, which have made attracting talent a priority, have dramatically improved their positions as well.

Despite their rapid economic rise, the BRIC nations still do not crack the upper tiers on the GCI: Russia ranks 31st, Brazil 46th, India 50th, and China 58th. The creative class, a key force in economic growth, makes up more than 40 percent of the work force in 40 nations. Of the BRIC, only Russia comes close, with 38.6 percent of its workforce in the Creative Class. The Creative Class makes up only 7.4 percent of China's workforce.

Our measures of global creativity are also closely associated with both established and alternative metrics of economic and social progress. Nations which score high on the GCI have higher levels of economic output, entrepreneurship, and overall economic competitiveness. Nations that invest in creativity and that achieve on the 3 Ts of economic development also have higher levels of human development, life satisfaction, and happiness.

Our study also helps us better understand the relationship between creativity, economic progress, and inequality. Nations which score high on the GCI have on balance greater levels of equality. While some countries, like the United States and the United Kingdom, achieve high GCI scores alongside relatively high levels of inequality, in general elevated levels of global creativity are associated with lower levels of inequality. This suggests that the old notion that it is large disparities in income that create the incentives and motivations that drive economic progress is no longer valid; at the same time it outlines a high-road path to prosperity, where the fruits of economic progress are broadly shared. Looking forward, sustained economic progress can no longer tolerate the waste of human talent, but must increasingly turn on the full development of each and every human being.

APPENDIX

METHODOLOGY, VARIABLES, AND DATA

The data in this report cover 82 nations for the period 2000 to 2009. Note that we use different years for different variables, and sometimes utilize running averages, depending on data availability. The following describes the main variables and data sources used in this report.

TECHNOLOGY

We use three variables for technology: R&D investment, research, and innovation.

Global R&D investment

This measures R&D spending as a share of GDP. It is adapted from World Development Indicators of the World Bank. It is defined as "current and capital expenditures on creative work undertaken systematically to increase the stock of knowledge, including knowledge of humanity, culture, and society, and the use of knowledge to devise new applications. R&D covers basic research, applied research, and experimental development."

Global researchers

This variable measures professional researchers engaged in R&D per million capita. It is adapted from World Development Indicators and covers the years 2000 to 2005. Professional researchers are defined as "professionals engaged in conceiving of or creating new knowledge, products, processes, methods, and systems and in managing projects concerned. Postgraduate students at the doctoral level (ISCED97 level 6) engaged in R&D are considered researchers."

The World Development Indicators are published by The World Bank on a yearly basis. The data is reported for 127–146 different countries depending on the year. However, since countries do not always report on an annual basis, we use averages for several years. This results in higher numbers of observations and also smoothes out extreme values. [38].

Global innovation

This variable measures patents granted per capita. It is adapted from the United States Patent and Trademark Office (USPTO) and covers the years 2001–2008. US patents are a reasonable proxy for global innovation as inventors from around the world file for patent protection in the United States and the USPTO tracks inventors' national origins. We count the number of *granted* US patents for each nation in the world. [39].

The technology index

The Technology Index combines all three of these variables in a single measure. The overall Technology Index is based on a principal component analysis, where the correlations between the overall index and the three constituent measures are as follows: Global R&D Investment (0.878), Global Researchers (0.894), and Global Innovation (0.943) with patents per capita. In other words, the overall technology score is based on the value for each sub-variable, and not its ranking. We estimate the index for countries with missing values by running regressions based on the variables for which we do have values. The R2s for these regressions are as follows: 0.535 for Global R&D Investment, 0.588 for Global Researchers, and 0.702 for Global Innovation.

TALENT

We employ two measures of talent: human capital and Creative Class population.

Human capital

The human capital variable is based on the standard measure of educational attainment. Specifically we use data on the rate of enrollment in tertiary or post-high school education from the World Development Indicators. The data is reported to the UNESCO Institute by national education agencies. Tertiary education is defined as "a wide range of post-secondary education institutions, including technical and vocational education, colleges, and universities, whether or not leading to an advanced research qualification, that normally require as a minimum condition of admission the successful completion of education at the secondary level." The data cover the years 2004 and 2006 and are based on annual school surveys, normally conducted in the beginning of the year, and do not therefore reflect dropouts or actual attendance.

Creative Class

The creative class variable is based on data from the International Labour Organization [40] and covers the years 2004–2007. It is calculated as the share of a country's labor force that is engaged in a higher degree of problem solving in their everyday work. It includes occupations such as computer science and mathematics; architecture, engineering; life, physical, and the social sciences; education, training, and library science; arts and design work, entertainment, sports, and media; and professional and knowledge work occupations in management, business and finance, law, sales management, and healthcare.

The talent index

The Talent Index combines these two variables in a single index which is based on a principal component analysis, where the correlations are 0.872 for the Creative Class variable and the Human Capital variable respectively. In other words, the overall talent score is based on the value for each sub-variable and not its ranking. We estimate missing values through a regression analysis, which generates an R2 value of 0.501.

TOLERANCE

We employ two measures of tolerance; both are from the Gallup Organization's World Poll. [37]

Tolerance toward ethnic and racial minorities

The survey asks "Is your city or area a good or bad place to be in for ethnic and racial minorities?" Our variable scores the share of the respondents who said their place is a good place. The value is for the year 2009.

Tolerance toward gays and lesbians

The survey asks "Is your city or area a good or bad place to be in for gay and lesbian people?" Our variable scores the share of the respondents who said their place is a good place. Again, the value is for the year 2009.

The Gallup World Poll survey is based on approximately 1,000 interviews per country (adjusted depending on population size) which are conducted in approximately 150 countries. The sample represents roughly 95 percent of the world's adult population and is stratified proportionally, with the distribution of the population across cities and rural areas of different sizes. (For more information about the sampling procedure, see: http://www.gallup.com/consulting/worldpoll/108082/Sampling.aspx). The target population is all civilian, non-institutionalized, and ages 15 years or older. For more information about the methodology, see: http://www.gallup.com/consulting/worldpoll/108079/Methodological-Design.aspx).

These tolerance measures differ from those used in the earlier version of the Global Creativity Index that was presented in Richard Florida's The Flight of the Creative Class [8], which were based on variables from the World Values Survey. The new measures represent an improvement across two dimensions. First and foremost, the newly available Gallup World Poll data provides a better, more direct measure of tolerance. And second, the World Poll data covers a larger number of countries. That said, these two sets of variables are closely correlated. Our Gallup World Poll measure of Racial and Ethnic Tolerance is correlated at .501 with our earlier tolerance measure, while the Gallup Gay and Lesbian Tolerance measure is correlated at 0.822 with our earlier measure.

The tolerance index

The Tolerance Index is based on the two measures above. The two are equally weighted into a factor where both correlate at 0.92. We estimate missing values based on a regression analysis, which generates an R2 value of 0.432.

THE GLOBAL CREATIVITY INDEX

To create the final Global Creativity Index, we constructed the talent, technology and tolerance variable based on principle component analysis. In other words, each of the scores are based on the actual performance and not the rank of each individual variable. We thereafter ranked each of the 3 T variables, with the highest number to the best performer. We added the ranks together and divided by three. In the case where we had a value for just two of the three variables, these two were added and divided by two. To get the Global Creativity Index score, the average score of the 3 Ts were divided by the number of observations overall.

ECONOMIC AND SOCIAL PROGRESS MEASURES

We employ the following measures of economic and social progress in our analysis.

Economic output/GDP per capita

We employ the conventional measure of economic output: GDP per capita. The data are from World Development Indicators for the year 2005. [38].

Global competitiveness index

We use the Global Competitiveness Index developed by Michael Porter for the World Economic Forum. It is based on the following categories: basic requirements (including institutions, infrastructure, macroeconomic stability, and health and primary education), efficiency enhancers (including higher education and training, goods market efficiency, labor market efficiency, financial market sophistication, technological readiness, and market size), and innovation factors (including business sophistication and innovation). [24].

Global entrepreneurship index

This variable is based on the Global Entrepreneurship Index developed by Zoltan Acs and Laszlo Szerb. The index consists of several measures of entrepreneurial attitudes, activity, and aspiration, and covers the years 2004–2008. [25].

Income inequality

This variable is based on the standard measure of an Income Inequality—a Gini Index. The Gini Index measures the distribution of incomes in a nation, ranging from 0 to 100 where 0 represents absolute equality and 100 absolute inequality. This variable is from the World Bank's World Development Indicators for the year 2007 [38].

Human development index

This variable is based on the United Nations Human Development Index, a composite measure which aims to capture three dimensions of human development: health and measured life expectancy, education level, and standard of living. We employ the 2009 index, which is based on data from 2007 [27].

Happiness/life satifaction

This variable is from the Gallup Organization's 2009 Gallup World Poll. It is representative of 95 percent of the world population, and is based on telephone surveys and face-to-face interviews which pose this question: "Please imagine a ladder with steps numbered from 0 at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?" Our variable is the national average rank of life satisfaction [37].

Global technology rankings*

Appendix A

COUNTRY	R&D INVESTMENT	RESEARCHERS	INNOVATION	TECHNOLOGY INDEX
Finland	3	1	4	1
Japan	4	3	2	2
United States	6	7	1	3
Israel	1	—	5	4
Sweden	2	2	6	5
Switzerland	5	11	3	6
Denmark	9	5	9	7
Republic of Korea	7	16	—	8
Germany	8	13	7	9
Singapore	11	4	11	10
Canada	13	9	8	11
Norway	18	6	18	12
Austria	12	14	13	13
France	10	15	16	14
Australia	17	8	17	15
Belgium	14	17	15	16
Netherlands	16	18	12	17
United Kingdom	15	—	14	18
New Zealand	25	10	20	19
Ireland	23	19	19	20
Russian Federation	22	12	36	21
Hong Kong	41	26	10	22
Slovenia	20	22	22	23
Spain	29	21	23	24
Czech Republic	21	27	26	25
Italy	27	34	21	26
Estonia	33	20	30	27
Serbia	19	—	59	28
Croatia	24	28	31	29
China	26	39	—	30
Lithuania	36	23	34	31
Portugal	35	24	35	32
Hungary	32	30	24	33
Ukraine	28	—	50	34
Uganda	30	—	72	35
Slovakia	44	25	39	36
Poland	45	29	44	37
Greece	39	32	33	38
Latvia	47	31	42	39
Bulgaria	46	33	41	40

COUNTRY	R&D INVESTMENT	RESEARCHERS	INNOVATION	TECHNOLOGY INDEX
Brazil	31	43	46	41
India	38	36	27	42
Costa Rica	51	—	28	43
Azerbaijan	55	—	65	44
South Africa	34	46	32	45
Armenia	61	—	51	46
Georgia	62	—	45	47
Chile	40	41	55	48
Romania	50	35	52	49
Kyrgyzstan	65	—	66	50
Turkey	37	44	54	51
Philippines	68	—	56	52
Trinidad and Tobago	69	—	40	53
Malaysia	42	45	25	54
Argentina	48	37	37	55
Peru	70	—	61	56
Jamaica	73	—	49	57
Honduras	76	—	64	58
Cyprus	53	40	29	59
Kazakhstan	60	38	63	60
Macedonia	56	42	62	61
Mexico	49	49	—	62
Uruguay	59	47	48	63
Thailand	58	48	47	64
Panama	52	54	53	65
Bolivia	57	53	67	66
El Salvador	—	57	60	67
Viet Nam	64	52	70	68
Sri Lanka	67	51	58	69
Madagascar	63	59	71	70
Paraguay	71	55	69	71
Ecuador	72	58	57	72
Pakistan	66	56	—	73
Indonesia	74	50	—	74
Cambodia	75	60	—	75

*missing values for countries: Egypt, Iran, Mongolia, Nicaragua, Saudi Arabia, Taiwan, and United Arab Emirates.

Global talent rankings

Appendix B

COUNTRY	HUMAN CAPITAL	CREATIVE CLASS	TALENT INDEX
Finland	1	8	1
Sweden	5	5	2
Singapore	—	1	3
Denmark	8	7	4
New Zealand	4	14	5
Norway	7	9	6
Australia	12	4	7
United States	6	27	8
Greece	3	29	9
Slovenia	9	22	10
Netherlands	24	2	11
Belgium	22	6	12
Russian Federation	13	20	13
Latvia	10	23	14
Estonia	16	15	15
Lithuania	11	28	16
Canada	21	12	17
Italy	18	16	18
United Kingdom	23	11	19
Israel	26	13	20
Ireland	25	19	21
Switzerland	35	3	22
France	27	17	23
Republic of Korea	2	51	24
Hungary	20	24	25
Germany	31	10	26
Ukraine	14	31	27
Spain	15	34	28
Poland	19	30	29
Austria	32	21	30
Czech Republic	33	18	31
Taiwan	—	33	32
Slovakia	46	25	33
Portugal	28	41	34
Serbia	—	38	35
Argentina	17	62	36
Hong Kong	50	26	37
Bulgaria	41	35	38
Croatia	39	37	39
Kazakhstan	30	42	40
Egypt	48	32	41
Costa Rica	—	43	42

COUNTRY	HUMAN CAPITAL	CREATIVE CLASS	TALENT INDEX
Cyprus	47	36	43
Bolivia	45	—	44
Japan	29	63	45
Uruguay	42	49	46
Macedonia	53	39	47
Georgia	43	50	48
United Arab Emirates	—	47	49
Malaysia	51	40	50
Mongolia	38	54	51
Panama	37	65	52
Kyrgyzstan	44	60	53
Chile	34	67	54
Sri Lanka	—	53	55
Thailand	36	68	56
Saudi Arabia	56	44	57
Ecuador	—	55	58
Turkey	52	52	59
Jamaica	—	61	60
Armenia	54	—	61
Peru	49	64	62
Romania	40	72	63
Philippines	55	59	64
Mexico	58	58	65
Brazil	60	57	66
Azerbaijan	66	45	67
South Africa	65	48	68
Nicaragua	—	69	69
Trinidad and Tobago	67	46	70
Iran	59	66	71
Paraguay	57	70	72
El Salvador	62	71	73
Pakistan	69	56	74
India	68	—	75
China	61	75	76
Honduras	63	73	77
Viet Nam	64	74	78
Uganda	71	—	79
Indonesia	—	76	80
Cambodia	70	77	81
Madagascar	72	78	82

Global Creative Class rankings

Appendix C

RANK	COUNTRY	CREATIVE CLASS SHARE
1	Singapore	47.30
2	Netherlands	46.24
3	Switzerland	44.84
4	Australia	44.52
5	Sweden	43.88
6	Belgium	43.84
7	Denmark	43.71
8	Finland	43.35
9	Norway	42.11
10	Germany	41.57
11	United Kingdom	41.27
12	Canada	40.84
13	Israel	40.21
14	New Zealand	40.11
15	Estonia	39.64
16	Italy	39.26
17	France	39.24
18	Czech Republic	38.89
19	Ireland	38.84
20	Russian Federation	38.63
21	Austria	37.49
22	Slovenia	37.06
23	Latvia	35.47
24	Hungary	35.26
25	Slovakia	35.22
26	Hong Kong	35.22
27	United States	35.22
28	Lithuania	34.99
29	Greece	32.62
30	Poland	32.37
31	Ukraine	31.70
32	Egypt	31.38
33	Taiwan	31.34
34	Spain	30.98
35	Bulgaria	29.07
36	Cyprus	29.00
37	Croatia	28.85
38	Serbia	28.57
39	Macedonia	28.36
40	Malaysia	26.21

RANK	COUNTRY	CREATIVE CLASS SHARE
41	Portugal	25.28
42	Kazakhstan	24.77
43	Costa Rica	24.60
44	Saudi Arabia	23.15
45	Azerbaijan	22.67
46	Trinidad and Tobago	22.55
47	United Arab Emirates	22.02
48	South Africa	21.71
49	Uruguay	21.62
50	Georgia	21.40
51	Republic of Korea	21.30
52	Turkey	20.96
53	Sri Lanka	19.51
54	Mongolia	19.40
55	Ecuador	19.04
56	Pakistan	18.59
57	Brazil	18.52
58	Mexico	18.48
59	Philippines	18.41
60	Kyrgyzstan	18.40
61	Jamaica	18.32
62	Argentina	18.29
63	Japan	17.54
64	Peru	17.51
65	Panama	16.77
66	Iran	15.61
67	Chile	14.90
68	Thailand	14.66
69	Nicaragua	14.49
70	Paraguay	12.43
71	El Salvador	12.37
72	Romania	11.76
73	Honduras	9.44
74	Viet Nam	7.41
75	China	7.37
76	Indonesia	4.30
77	Cambodia	2.52
78	Madagascar	2.36

Global tolerance rankings*

Appendix D

COUNTRY	RACIAL AND ETHNIC MINORITIES	GAYS AND LESBIANS	TOLERANCE INDEX
Canada	1	2	1
Ireland	3	5	2
Netherlands	16	1	3
New Zealand	2	12	4
Australia	4	8	5
Spain	14	3	6
Sweden	7	8	7
United States	5	12	8
Uruguay	11	5	9
United Kingdom	9	10	10
Norway	16	12	11
Hong Kong	11	16	12
Belgium	21	6	13
Denmark	21	9	14
South Africa	7	21	15
France	30	14	16
Singapore	7	34	17
Germany	25	17	18
Finland	27	18	19
Switzerland	39	16	20
Taiwan	13	37	21
Brazil	—	21	22
Italy	30	19	23
Nicaragua	21	27	24
Cyprus	23	—	25
Costa Rica	25	27	26
Serbia	13	49	27
Chile	36	24	28
Malaysia	30	—	29
India	16	52	30
Argentina	45	23	31
Ecuador	33	31	32
Portugal	39	29	33
Hungary	33	34	34
Austria	—	31	35
Mexico	52	23	36
Greece	41	31	37
United Arab Emirates	41	—	38
Panama	44	37	39
Madagascar	18	65	40
Philippines	62	25	41
Sri Lanka	21	67	42

COUNTRY	RACIAL AND ETHNIC MINORITIES	GAYS AND LESBIANS	TOLERANCE INDEX
Trinidad and Tobago	27	55	43
Romania	33	54	44
Bulgaria	—	42	45
Croatia	41	47	46
El Salvador	55	34	47
Macedonia	30	57	48
Czech Republic	64	27	49
Armenia	49	—	50
Slovenia	55	39	51
Bolivia	49	42	53
Peru	49	42	53
Paraguay	58	39	54
Slovakia	52	44	55
Honduras	47	52	56
Kazakhstan	36	67	57
Poland	60	47	58
Uganda	36	70	59
Latvia	58	54	60
Japan	62	47	61
Republic of Korea	52	62	62
Georgia	43	72	63
Turkey	58	62	64
Kyrgyzstan	47	71	65
Israel	72	40	66
Thailand	66	50	67
Iran	65	—	68
Estonia	70	47	69
Viet Nam	64	59	70
Jamaica	58	68	71
Azerbaijan	—	70	72
Mongolia	68	57	73
Russian Federation	68	62	74
Lithuania	72	59	75
Egypt	72	—	76
Ukraine	74	62	77
Indonesia	70	73	78
Saudi Arabia	75	—	79
Cambodia	77	62	80
Pakistan	76	—	81

*missing value for China.

Overall Global Creativity Index rankings

Appendix E

TOTAL RANK	COUNTRY	TECHNOLOGY	TALENT	TOLERANCE	GLOBAL CREATIVITY INDEX
1	Sweden	5	2	7	0.923
2	United States	3	8	8	0.902
3	Finland	1	1	19	0.894
4	Denmark	7	4	14	0.878
5	Australia	15	7	5	0.870
6	New Zealand	19	5	4	0.866
7	Canada	11	17	1	0.862
7	Norway	12	6	11	0.862
9	Singapore	10	3	17	0.858
10	Netherlands	17	11	3	0.854
11	Belgium	16	12	13	0.813
12	Ireland	20	21	2	0.805
13	United Kingdom	18	19	10	0.789
14	Switzerland	6	22	20	0.785
15	France	14	23	16	0.764
15	Germany	9	26	18	0.764
17	Spain	24	28	6	0.744
18	Taiwan	—	32	21	0.737
19	Italy	26	18	23	0.707
20	Hong Kong	22	37	12	0.691
21	Austria	13	30	35	0.663
22	Greece	38	9	37	0.638
22	Slovenia	23	10	51	0.638
24	Serbia	28	35	27	0.614
24	Israel	4	20	66	0.614
26	Hungary	33	25	34	0.606
27	Republic of Korea	8	24	62	0.598
28	Portugal	32	34	33	0.577
29	Czech Republic	25	31	49	0.553
30	Japan	2	45	61	0.541
30	Russian Federation	21	13	74	0.541
32	Costa Rica	43	42	26	0.528
32	Estonia	27	15	69	0.528
34	Latvia	39	14	60	0.520
35	Croatia	29	39	46	0.516
36	United Arab Emirates	—	49	38	0.513
37	Uruguay	63	46	9	0.500
38	Argentina	55	36	31	0.484
38	Lithuania	31	16	75	0.484
40	Bulgaria	40	38	45	0.480
41	Slovakia	36	33	55	0.476
41	Poland	37	29	58	0.476

TOTAL RANK	COUNTRY	TECHNOLOGY	TALENT	TOLERANCE	GLOBAL CREATIVITY INDEX
43	Nicaragua	—	69	24	0.474
44	Cyprus	59	43	25	0.463
45	South Africa	45	68	15	0.459
46	Brazil	41	66	22	0.455
47	Chile	48	54	28	0.451
48	Malaysia	54	50	29	0.439
49	Ukraine	34	27	77	0.419
50	India	42	75	30	0.382
51	Panama	65	52	39	0.346
51	Romania	49	63	44	0.346
51	Macedonia	61	47	48	0.346
54	Philippines	52	64	41	0.341
54	Armenia	46	61	50	0.341
54	Kazakhstan	60	40	57	0.341
57	Georgia	47	48	63	0.337
58	China	30	76	—	0.327
59	Ecuador	72	58	32	0.321
60	Bolivia	66	44	53	0.319
61	Mexico	62	65	36	0.317
62	Egypt	—	41	76	0.316
63	Sri Lanka	69	55	42	0.305
63	Trinidad and Tobago	53	70	43	0.305
65	Kyrgyzstan	50	53	65	0.297
66	Peru	56	62	53	0.287
67	Uganda	35	79	59	0.276
68	Turkey	51	59	64	0.272
69	Mongolia	—	51	73	0.270
70	Azerbaijan	44	67	72	0.236
71	El Salvador	67	73	47	0.220
71	Thailand	64	56	67	0.220
73	Jamaica	57	60	71	0.215
74	Honduras	58	77	56	0.203
75	Madagascar	70	82	40	0.199
76	Saudi Arabia	—	57	79	0.191
77	Paraguay	71	72	54	0.179
78	Iran	—	71	68	0.171
79	Viet Nam	68	78	70	0.102
80	Pakistan	73	74	81	0.053
81	Indonesia	74	80	78	0.037
82	Cambodia	75	81	80	0.020

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