Martin Prosperity Institute

THE GLOBAL CREATIVITY INDEX 2015

Cities

Rotman

The Cities Project at the Martin Prosperity Institute focuses on the role of cities as the key economic and social organizing unit of global capitalism. It explores both the opportunities and challenges facing cities as they take on this heightened new role.

The Martin Prosperity Institute, housed at the University of Toronto's Rotman School of Management, explores the requisite underpinnings of a democratic capitalist economy that generate prosperity that is both robustly growing and broadly experienced.

THE GLOBAL CREATIVITY INDEX 2015

Richard Florida
Charlotta Mellander
Karen King

Contents

Exhibits

Executive Summary

This report presents the 2015 edition of the Global Creativity Index, or GCI. The GCI is a broad-based measure for advanced economic growth and sustainable prosperity based on the 3Ts of economic development — talent, technology, and tolerance. It rates and ranks 139 nations worldwide on each of these dimensions and on our overall measure of creativity and prosperity.

Overall Ranking: Australia takes the number one ranking on the GCI, supplanting Sweden, which took top spot in the previous 2004 and 2011 editions. The United States is second (maintaining its previous ranking). New Zealand is third, Canada fourth (up three spots from its previous ranking), with Denmark and Finland tied for fifth. The rest of the top ten includes Sweden in seventh, Iceland eighth, Singapore ninth, and the Netherlands tenth.

Creative Class: Luxembourg has the largest share of the creative class (54 percent) — which spans science and technology; arts and culture; and business, management, and the professions. Bermuda is second (48 percent), Singapore third (47 percent), down from first in 2011. Switzerland (47 percent) is fourth and Iceland (45 percent) is fifth. Rounding out the top ten are Australia (45 percent), Sweden (45 percent), the Netherlands (44 percent), Canada (44 percent), and the United Kingdom (44 percent). The United States is 34th with 33 percent.

Technology: South Korea leads in technology. Japan is second, Israel third, the United States fourth, and Finland is fifth. Australia, New Zealand, Germany, Singapore, and Denmark round out the top ten.

Talent: Australia leads in talent. Iceland is second. The United States and Finland are tied for third with Singapore in fifth. Denmark, Slovenia, Belarus, New Zealand, and Sweden round out the top ten.

Tolerance: Canada takes the top spot in tolerance which we measure as openness to ethnic and religious minorities and gay and lesbian people. Iceland is second, New Zealand third, Australia fourth, and the United Kingdom fifth. The Netherlands, Uruguay, Ireland, Norway, and Sweden round out the top ten.

Creativity, Competitiveness, and Prosperity: Global creativity, as measured by the GCI, is closely connected to the economic development, competitiveness, and prosperity of nations. Countries that score highly on the GCI have higher levels of productivity (measured as economic output per person), competitiveness, entrepreneurship, and overall human development. Creativity is also closely connected to urbanization, with more urbanized nations scoring higher on the GCI.

The GCI is associated with higher levels of equality. Nations that rank highly on the GCI also tend to be, on balance, more equal societies. There are two approaches to balancing creative economic growth and inequality. A high road path, associated with the Scandinavian nations, combines high levels of creative competitiveness with relatively low levels of inequality. The low road path, associated with the United States and the United Kingdom, combines high levels of creative competitiveness with much higher levels of inequality.

Capitalism is in the midst of an epochal transformation from its previous industrial model to a new one based on creativity and knowledge.[1] In place of the natural resources and large-scale industries that powered the growth of industrial capitalism, the growth of creative capitalism turns on knowledge, innovation, and talent. Adam Smith long ago called attention to the role of human capital as a "fourth factor of production" alongside land, labor, and capital.[2]

Creativity differs in fundamental ways from the traditional, tangible factors of production. It is not a stock of things that can be depleted or worn out, but an infinitely renewable resource that can be continually replenished and deepened.[3] Innovation and economic progress also stem from diversity and openness to talented people across the board. Capitalism in the Creative Age is thus organized more around places that attract and mobilize talent and technology. Indeed, place has supplanted the corporation as the key economic and social organizing unit of our time.[4]

Just as the older model of industrial capitalism was organized around major classes — capitalists and the working class — the new model of creative capitalism gave rise to a new set of occupational classes. The working class, which has declined from its peak of nearly half

the workforce to just one in five workers in most advanced nations, has given way to two even larger classes. The creative class, which comprises a third to more than forty percent of the workforce in the advanced nations, includes scientists and technologists; artists, cultural creatives, and media workers, as well knowledge-based professionals in business, education, and health-care.[5] While the varied members of the working class had physical skills as a shared trait, the diverse groups of workers that make up the creative class all draw on their underlying human creativity. The even larger service class is made up of lower-skill, lower-wage, routine service occupations in fields like health care support, food preparation and service, low-end retail, and office and administrative positions. The divide between these two main classes lies at the root of growing inequality and class division across advanced and developing nations alike.

Growth and prosperity under creative capitalism turns on a new model we term the 3Ts of economic development — Technology, Talent, and Tolerance.[6]

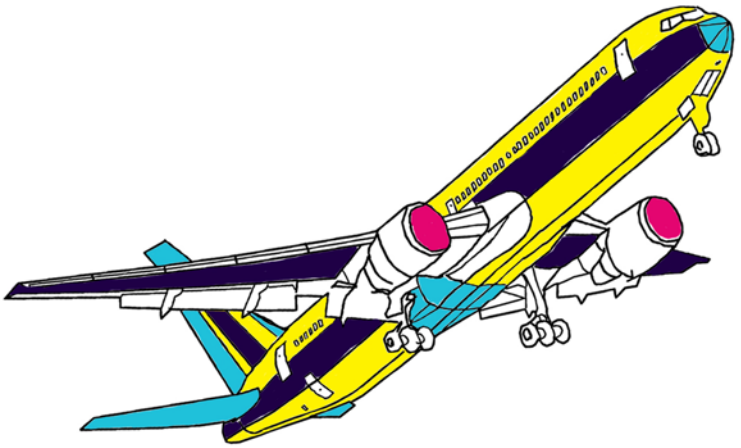
Technology is the first T. It has long been recognized as a key driver of wealth and progress. Karl Marx and later Joseph Schumpeter noted that advances in technology enable capitalism to generate new industries and spur new growth.[7] In the late 1950s, Robert Solow defined technology's role as a driving force in economic growth, for which he received the Nobel Prize in economics.[8] Technology increases productivity, creates wealth, and enables capitalism to constantly reinvent itself.[9] The GCI includes both the standard measure of R&D effort — the share of GDP devoted to R&D — and the standard measure of innovation, which is based on patents.

Talent is the second T. Talent, or human capital, stands alongside technology as a primary driver of economic growth.[10] As far back as the 1950s and 1960s, Peter Drucker and Fritz Malchup identified the role of knowledge workers to economic development.[11] Paul Romer later formalized the role of knowledge and connected it with technology in his theory of endogenous growth.[12] A large amount of research has shown the close connection between talent and economic progress. Beginning with Jacob Mincer's classic models of human capital, a wide body of studies has documented the connection between human capital and economic development at both the national and regional levels.[13] A more recent stream of research suggests an alternative measure for human capital based on occupation, or class, to better capture human capital effects in relation to growth and innovation.[14] The GCI includes both educational and occupational measures of talent.

Tolerance is the third T. Tolerance acts on economic development by helping to establish the broad context for both technological innovation and talent attraction. Places that are open to different kinds of people gain an edge in both attracting talent from across the spectrum and mobilizing new ideas.[15] Tolerance thus forms an additional source of economic advantage that works alongside technology and talent. The GCI includes two measures of tolerance — openness to ethnic and religious minorities and openness to gay and lesbian people.

This updated 2015 edition of the Global Creativity Index assesses the creative performance and longer run economic potential of 139 nations across the world. It expands the previous 2011 edition, adding more than 50 additional countries to the analysis.[16]

The report is organized into two major parts. The first part presents the rankings of nations on each of the 3Ts. We then combine these individual scores into our overall ranking on the Global Creativity Index (GCI). The second part examines the connections between the GCI and broader measures of economic development, competitiveness, and prosperity. The details of our methodology, data sources, and variable definitions can be found in the appendix.



This section assesses nations on the 3Ts of economic development. We begin with technology, and then turn to talent and tolerance.

1.1 Global Technology

Technology plays a fundamental role in the knowledge-based economy and society as a whole. From new inventions in industries like software, robotics, and biotechnology to improvements in manufacturing systems and processes, technology makes economies and societies more efficient and productive.

We measure global technology two ways: the standard measure of research and development (R&D) effort, the share of GDP devoted to R&D and the standard measure of innovation based on the number of applied patents per capita.[17]

1.1.1 Global R&D investment

The global R&D investment map (*Exhibit 1*) charts nations in terms of their levels of R&D investment, which ranges from just a fraction of one percent to 4.4 percent.

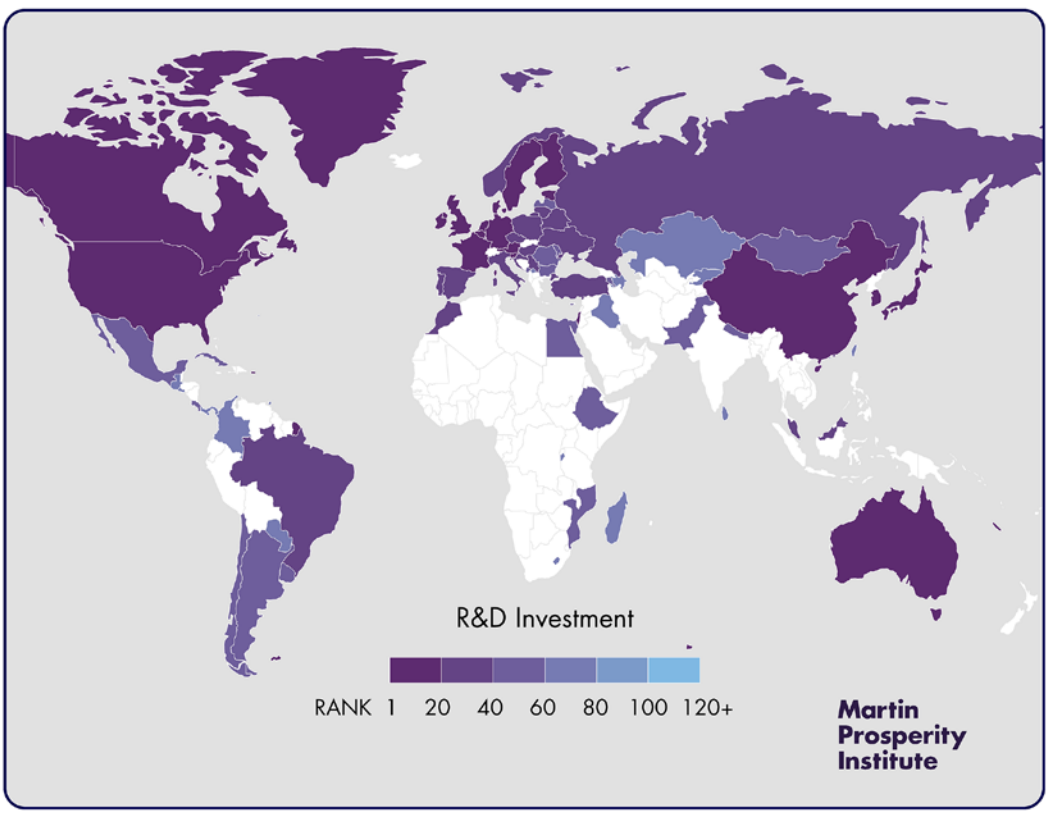


Exhibit 1: The global R&D investment map

Israel takes the top spot (as it did in 2011), while Finland is in second (3.84 percent). They are followed by South Korea (3.74 percent), Sweden (3.38 percent), and Japan (3.26 percent) in the top five. Denmark, Germany, the United States, Austria, and Australia round out the top ten. Canada is 18th (1.80 percent). Of the BRICs, China is in 17th (1.80 percent), Brazil is 28th (1.16 percent), and Russia follows in 29th (1.14 percent).

1.1.2 Global innovation

Patents are the standard measure of innovation. The global innovation map (*Exhibit 2*) tracks the number of patent applications per million people. The variation is substantial from less than one to more than 3,500 patents per million people.

South Korea takes the top spot, with 3,606 patent applications per million people. Japan (2,691), Singapore (1,878), and Hong Kong (1,797) are our top four with the United States (1,644) falling to fifth after topping our previous list. New Zealand, Australia, Canada, Israel, and Germany round out the top ten. Of the BRICs, China sits just outside the top ten in the 11th spot, Russia is 18th, Brazil 31st, and India 71st.

1.1.3 Global technology

The global technology map (*Exhibit 3*) combines these two measures.

South Korea takes first place overall followed by Japan, Israel, and the United States. Finland, Australia, New Zealand, Germany, Singapore,

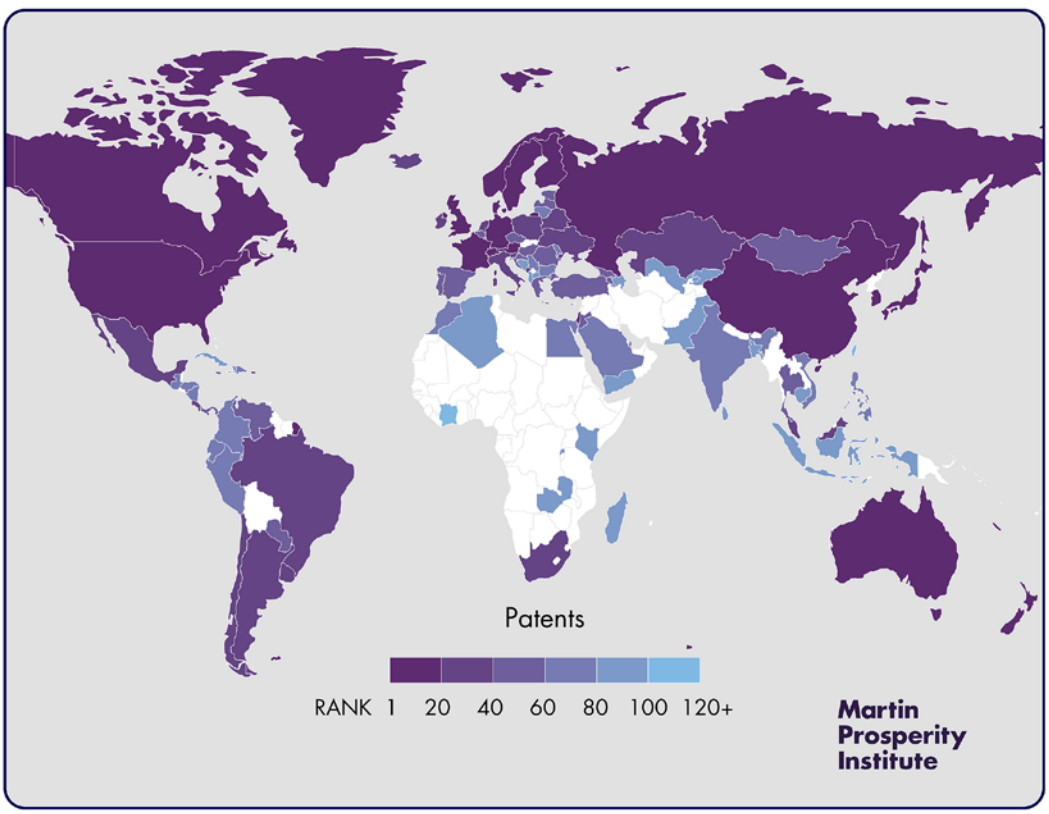


Exhibit 2: The global innovation (patents) map

and Denmark round out the top ten. Sweden and Switzerland, which both ranked in the top ten in the 2011 edition of the report, fell to 11th and 19th places respectively. Canada is 13th, down two spots from 2011. Of the BRICs, China is 14th, Russia 22nd, Brazil 27th, and India 52nd.

1.2 Creative Class & Global Talent

Talent is a driver of economic growth in today's creative economy. We measure talent two ways — by the share of the workforce in the creative class and the share of adults with higher education.

1.2.1 Global creative class

The creative class includes workers in science and technology and engineering; arts, culture, entertainment, and the media; business and management; and education, healthcare, and law. Here again we see the incredible variation and unevenness across the world from just one percent to more than 50 percent of the workforce. The creative class makes up 40 percent or more of the workforce in 18 nations across the globe.

The global creative class map (*Exhibit 4*) shows how nations stack up on the creative class.

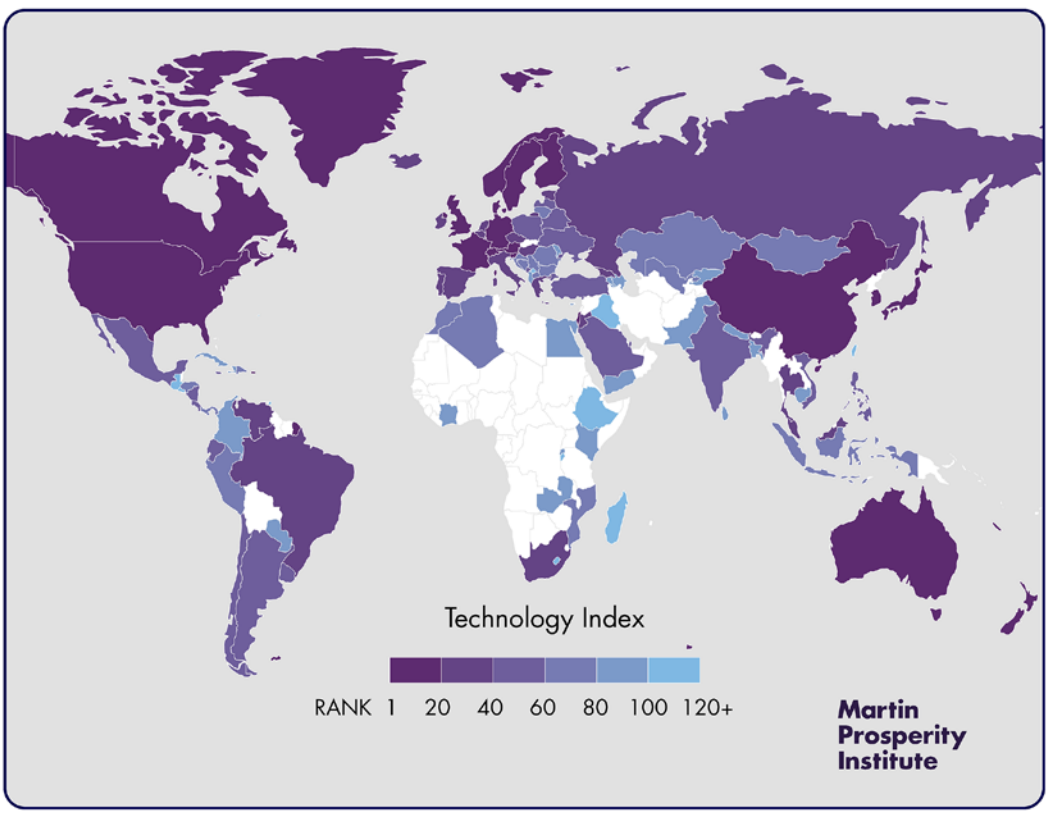


Exhibit 3: The global technology map

Luxembourg takes top spot with more than half (54 percent) of its workforce made up of the creative class. It is followed by Bermuda (48 percent) in second, Singapore is third (47 percent), Switzerland fourth (47 percent), and Iceland fifth (45 percent). Australia (45 percent), Sweden (45 percent), the Netherlands (44 percent), Canada (44 percent), and the United Kingdom (44 percent) round out the top ten. The United States (33 percent) ranks 34th down from 27th in 2011. Russia is 19th with 39 percent and Brazil 61st with 20 percent.

1.2.2 Global educational attainment

Education is a key factor in both skill accumulation and, more broadly, economic development. Economists have long noted that educational skills drive economic growth and development.

Our measure of educational attainment is based on the share of population that participates in tertiary education including universities, colleges, community colleges, and technical training institutes. We use the conventional gross tertiary enrollment ratio which compares the number of people enrolled in some form of

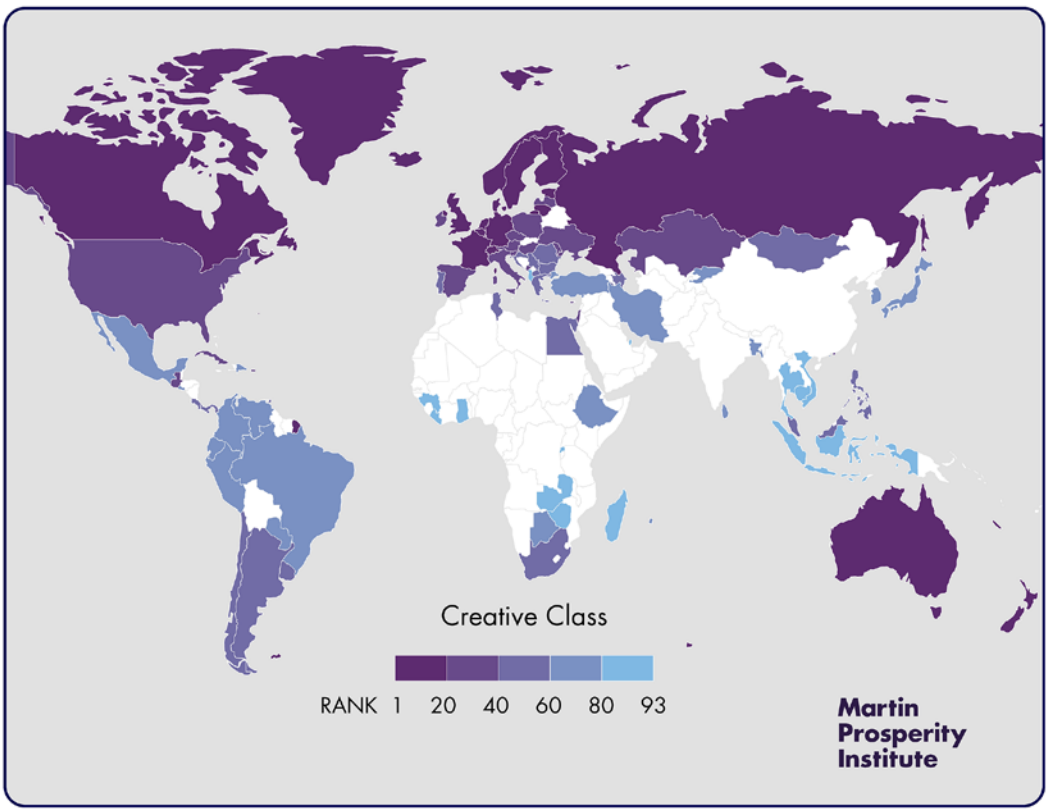


Exhibit 4: The global creative class map

post-secondary education to everyone in the appropriate age group — the five years that proceed the end of secondary school.

The global educational attainment map (*Exhibit 5*) shows how nations compare on this measure. There is a broad span of educational attainment across the globe, from zero to 100 percent.

South Korea takes the top spot with a 100 percent tertiary enrollment ratio. The United States is second (94 percent) with Finland just behind in third (94 percent). Slovenia (87 percent), Belarus (85 percent), Australia (83 percent), Spain (82 percent), New Zealand (81 percent), Iceland (80 percent), and Cuba (79 percent) round out the top ten. Among the BRICs, Russia (77 percent) is at highest 15th; the others — China (25 percent) is 77th, and India (22 percent) 82nd — rank substantially lower.

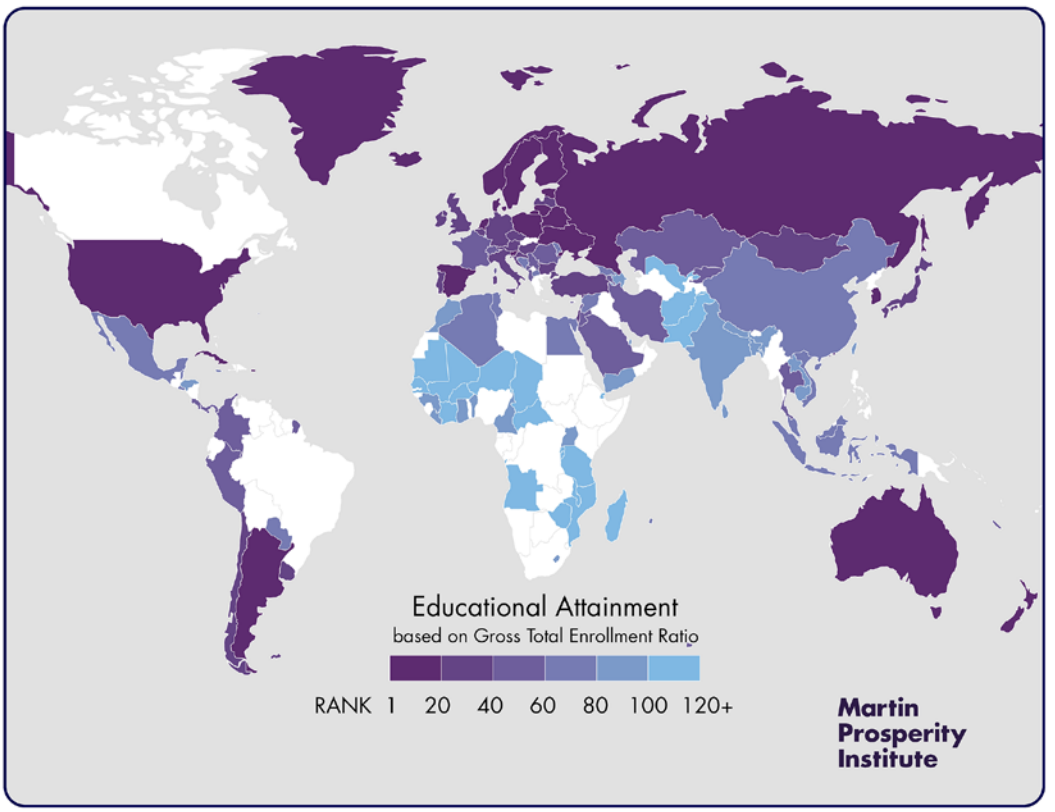


Exhibit 5: The global human capital map

1.2.3 Global talent

The global talent map (*Exhibit 6*) combines our measures of the creative class and educational attainment.

Australia takes the top spot, up from seventh in 2011. Iceland is second. The United States and Finland are tied for third with Singapore in fifth. Denmark, Sweden, Slovenia, Belarus, and New Zealand round out the top ten. Canada is 14th. Among the BRICs, Russia is 15th, Brazil is 68th, China is 87th, and India is 92nd.

1.3 Global Tolerance

Tolerance is the third T. A growing body of research finds that openness to diversity spurs economic development while homogeneity stunts economic growth. Places that are open to new ideas also tend to attract creative people from around the globe that provide an edge in generating the innovations and startup companies that create new industries. These places broaden their technology and talent capabilities, giving them an economic edge over less tolerant places.[18]

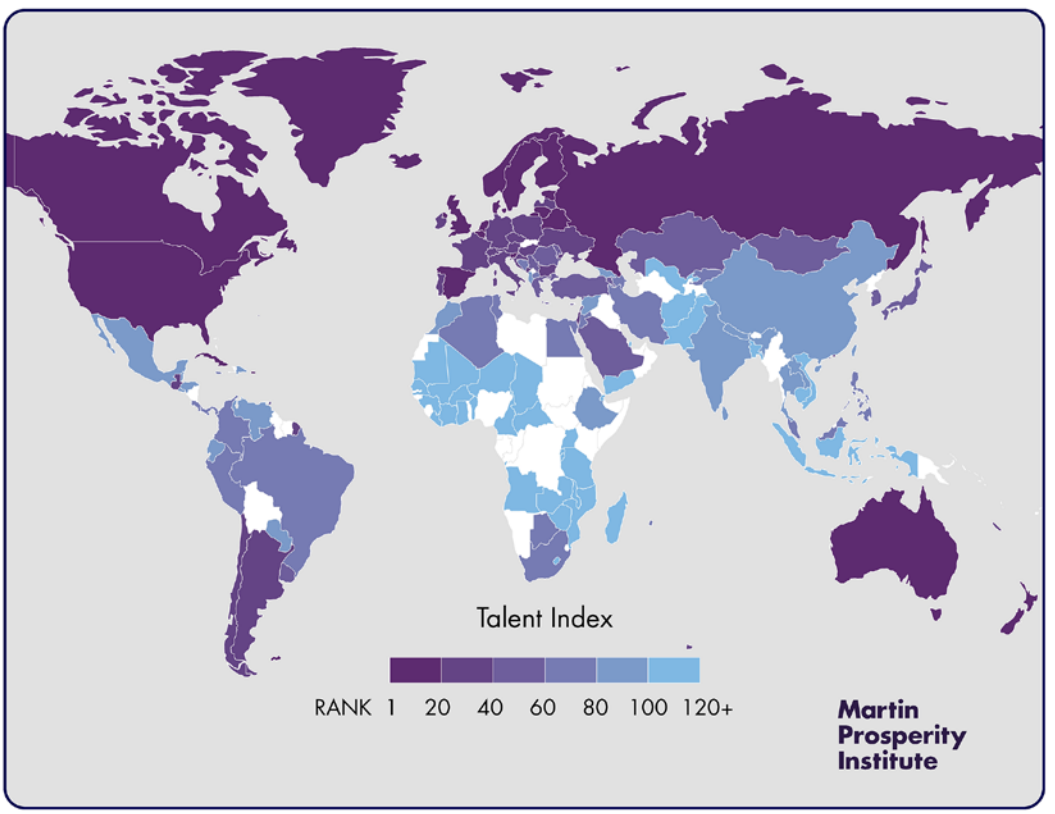


Exhibit 6: The global talent map

We measure tolerance two ways: by the share of people who say their city or town is a good place for ethnic and racial minorities and the share who say their city or town is a good place for gay and lesbian people.

1.3.1 Global racial and ethnic tolerance

The global racial and ethnic tolerance map (*Exhibit 7*) shows how nations stack up on the openness to and acceptance of racial and ethnic minorities. Tolerance to racial and ethnic minorities spans a broad range—from a nation where just 12 percent of people believes their city is a good place for racial and ethnic minorities to several where more than 90 percent do.

New Zealand tops the list with 93 percent of those surveyed saying their city is a good place for racial and ethnic minorities. Burkina Faso is second (92 percent), Canada third (91 percent), Norway fourth (90 percent), and Iceland fifth (90 percent). Singapore, Bangladesh, Mali, Australia, and Nepal make up the rest of the top ten. Of the BRICs, Brazil (83 percent) ranked

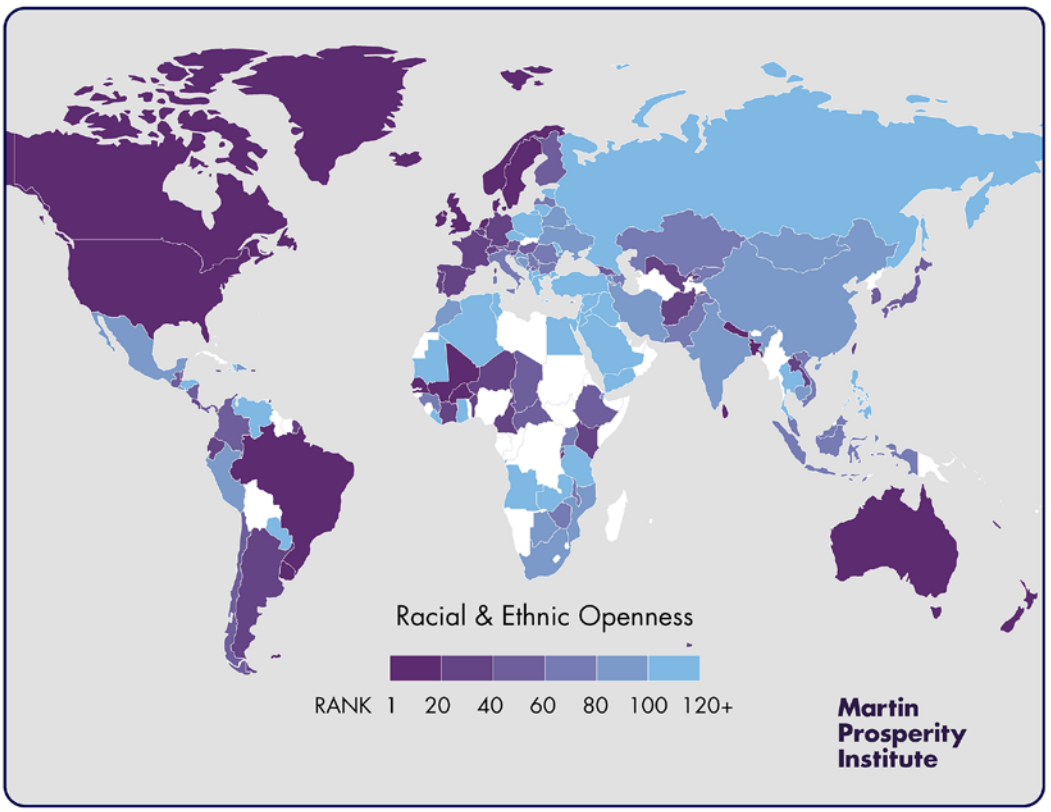


Exhibit 7: The global racial and ethnic tolerance map

17th, but the other BRIC nations ranked much lower: China (62 percent) is 90th, India (60 percent) 92nd, and Russia (50 percent) 114th.

1.3.2 Global gay and lesbian tolerance

The global gay and lesbian tolerance map (*Exhibit 8*) shows how nations stack up on the acceptance of gay and lesbian people. There is a similarly broad variation among nations in terms of tolerance toward gay and lesbian people: from a nation where just one percent of people believe their city is a good place for gay and lesbian people to several where more than three-quarters do.

The Netherlands tops the list (with 85 percent of those surveyed saying their city is a good place for gay and lesbian people). It is also the only country in the top ten whose openness to gay and lesbian people is greater than its openness toward ethnic and racial minorities. Canada is second (81 percent) and Spain is third (80 percent). Iceland (79 percent) and Uruguay (76 percent) round out the top five. The United

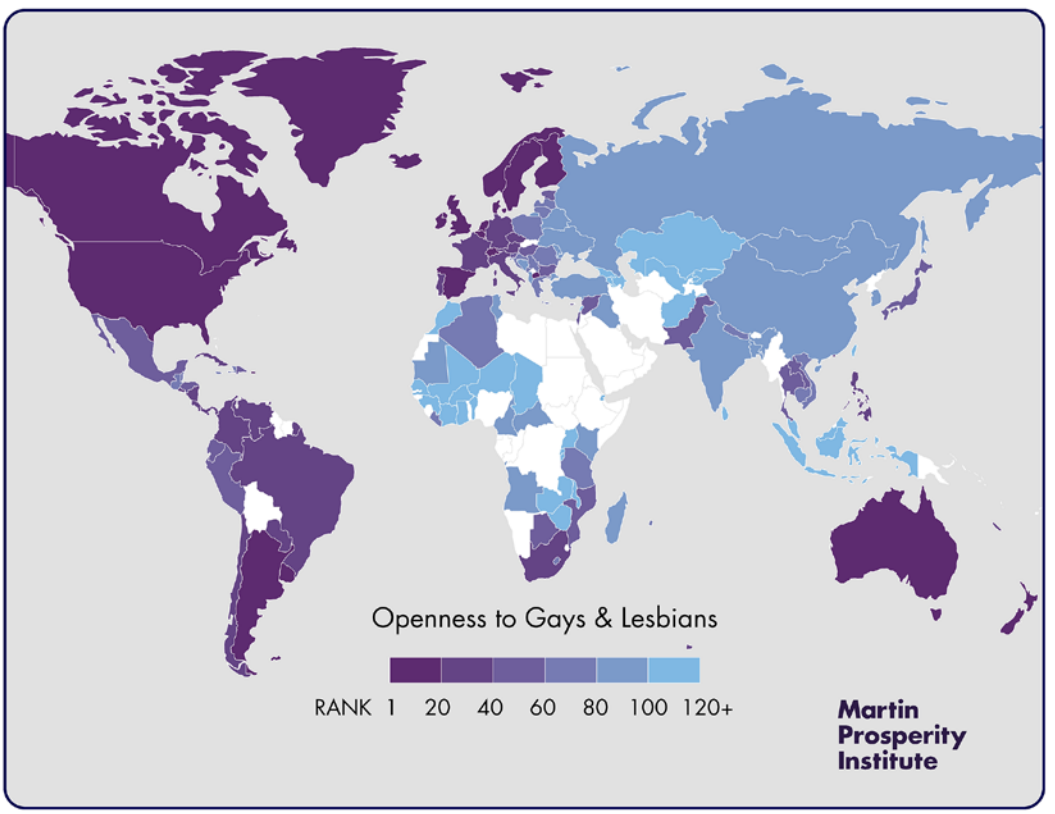


Exhibit 8: The global gay and lesbian tolerance map

Kingdom (75 percent), Ireland (75 percent), Australia (72 percent), the United States (70 percent), and Macedonia (69 percent) round out the top ten. Of the BRICSs, Brazil ranks highest (22nd, 62 percent); China (83rd) with 14 percent, Russia (89th) 12 percent, and India (91st) 11 percent, all rank much lower.

1.3.3 Global tolerance

The global tolerance map (*Exhibit 9*) combines the previous two indexes — openness to ethnic and racial minorities and openness to gay and lesbian people — into a single index of acceptance.

Canada tops the list followed by Iceland, New Zealand, Australia, and the United Kingdom. The Netherlands, Uruguay, Ireland, Norway, and Sweden round out the top ten. The United States is 11th. Brazil (at 15th) ranks much higher than the rest of the BRIC nations: China is 96th, India 108th, and Russia 123rd.

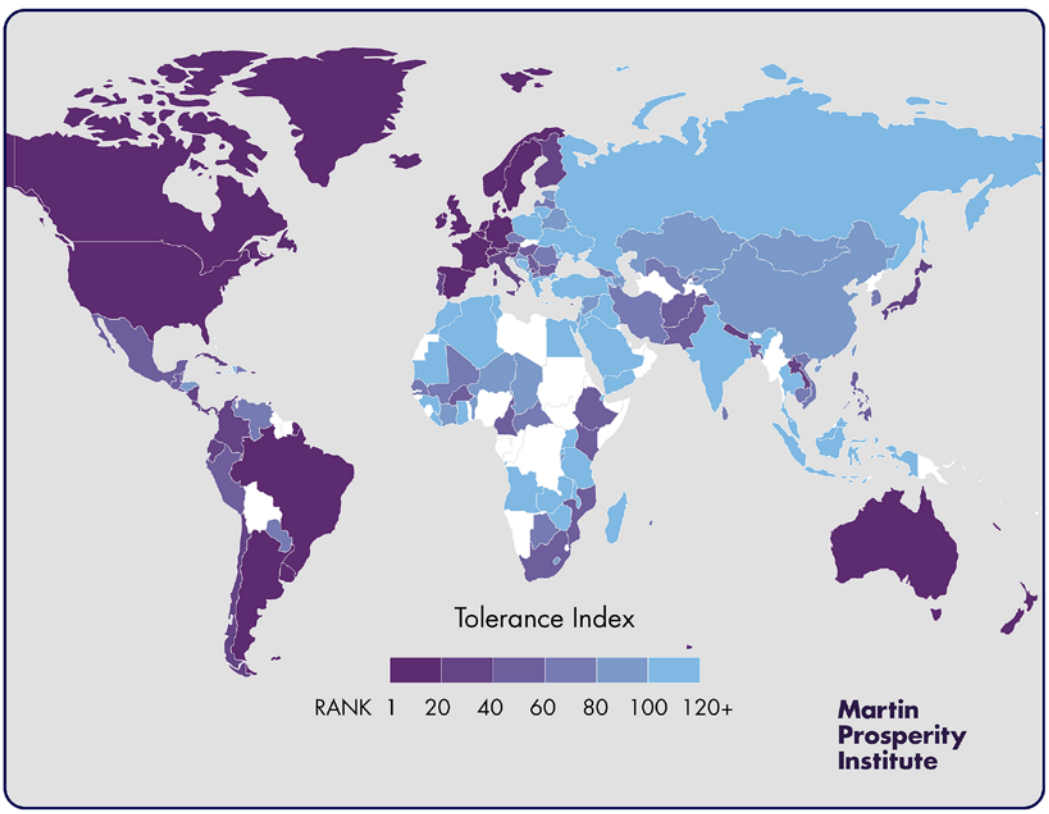


Exhibit 9: The global tolerance map

1.4 The Global Creativity Index

We now bring talent, technology, and tolerance together into a single index, the Global Creativity Index, or GCI.

The Global Creativity Index map (*Exhibit 10*) shows how the nations of the world stack up on our overall measure of the GCI.

Australia takes the top spot on the overall GCI, up from its fifth place rank on the 2011 edition and supplanting Sweden, which took top spot in both 2004 and 2011, but now falls to seventh. The United States is second maintaining its earlier ranking. New Zealand is third and Canada is fourth. Denmark and Finland are tied for fifth, Iceland eighth, Singapore ninth, and the Netherlands tenth. *Exhibit 11* shows the top 25 countries on the GCI. Among the BRIC nations, Brazil ranks 29th, Russia 38th, China 62nd, and India 99th.

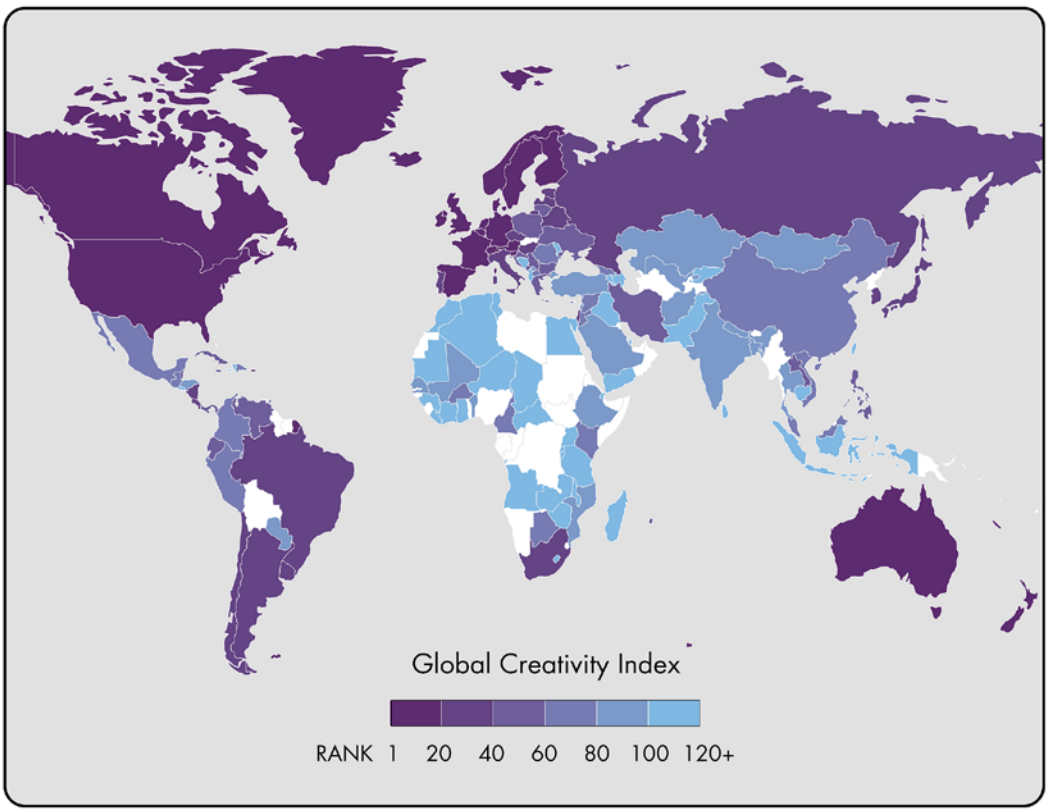
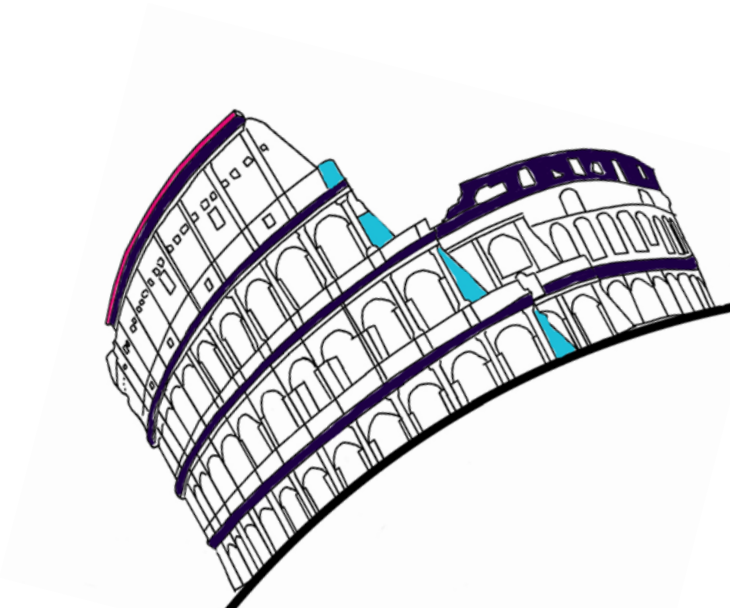


Exhibit 10: The Global Creativity Index map

Rank	Country	Technology	Talent	Tolerance	Global Creativity Index
1	Australia	7	1	4	0.970
2	United States	4	3	11	0.950
3	New Zealand	7	8	3	0.949
4	Canada	13	14	1	0.920
5	Denmark	10	6	13	0.917
5	Finland	5	3	20	0.917
7	Sweden	11	8	10	0.915
8	Iceland	26	2	2	0.913
9	Singapore	7	5	23	0.896
10	Netherlands	20	11	6	0.889
11	Norway	18	12	9	0.883
12	United Kingdom	15	20	5	0.881
13	Ireland	23	21	7	0.845
14	Germany	7	28	18	0.837
16	Switzerland	19	22	17	0.822
16	France	16	26	16	0.822
16	Slovenia	17	8	35	0.822
18	Belgium	28	18	14	0.817
19	Spain	31	19	12	0.811
20	Austria	12	26	32	0.788
21	Hong Kong	32	32	30	0.715
21	Italy	25	31	38	0.715
23	Portugal	35	36	22	0.710
24	Japan	2	58	39	0.708
25	Luxembourg	20	48	32	0.696

Exhibit 11: Top 25 Countries on the Global Creativity Index



Having seen how nations stack up on the GCI, we now turn to the connection between creativity and a variety of measures of economic and social progress.[19] We structure our analysis around four key issues:

- *Are more creative economies also more productive and competitive?*
  Here, we consider the association of GCI to the standard measures of economic output, GDP per capita, and of global competitiveness based on the World Economic Forum's Global Competitive Index.

- *Are more creative nations generally associated with higher levels of human development?*
  Here, we compare the GCI to a broad measure of human development, the United Nations' Human Development Index.

- *Are more creative nations more urbanized?*
  On this score, we examine the relationship between the GCI and the urbanized share of the population using World Development Indicators.

- *Are creative economies more or less equal?*
  Here, we look at the relationship between the GCI and the standard measure of income inequality based on the Gini Coefficient.

2.1 Creativity and economic output

We start with the relationship between the GCI and the standard measure of economic output: GDP per capita. *Exhibit 12* shows the correlations between economic output and the GCI, as well as for each of the 3Ts.

The GCI and each of the 3Ts are positively associated with economic output per capita. Tolerance has the strongest association of the 3Ts (with a correlation of 0.64), followed by talent (0.58) and technology (0.53). The strongest correlation is with the GCI overall (0.65), indicating the combined effect of all 3Ts working in unison.

The scatter graph (*Exhibit 13*) shows how individual nations lineup in terms of the connection between the GCI and GDP per capita.

The fitted line slopes strongly upward, indicating the positive relationship between the two. In the upper right hand corner are nations like the United States, Canada, the United Kingdom, Australia, New Zealand, and the Northern European and Scandinavian countries. In the bottom left hand corner are Liberia, Uganda, Haiti, Ethiopia, and Bangladesh. Middle East oil producing nations, like Qatar, Kuwait, Iraq, and Saudi Arabia, all rank high in terms of economic output, but are low on the GCI. The 3Ts understandably matter less to oil based economies, where wealth can be pumped out of the ground. But they matter much more to knowledge-based economic growth.

2.2 Creativity and competitiveness

Next, we look at the relationship between the GCI and economic competitiveness. Our measure of competitiveness is based on the World Economic Forum's Global Competitiveness Index — a comprehensive measure based on economic output, innovation, efficiency, and the overall business climate.[20]

Exhibit 14 shows the relationship between the GCI and economic competitiveness. The overall correlation (0.78) is stronger than that for GDP per capita. Of the 3Ts, technology (0.76) has the strongest relationship followed by talent, at approximately the same level (0.73), while tolerance is somewhat weaker (0.56).

Exhibit 15 plots how individual nations stack up on the relationship between the GCI and economic competitiveness. Again, the line slopes steeply upward showing the close connection between the two. In the upper right hand corner of the graph, we find Singapore, the United States, Canada, Finland, Denmark, New Zealand, and Australia. In the bottom left we find poor nations like Haiti and Burundi.

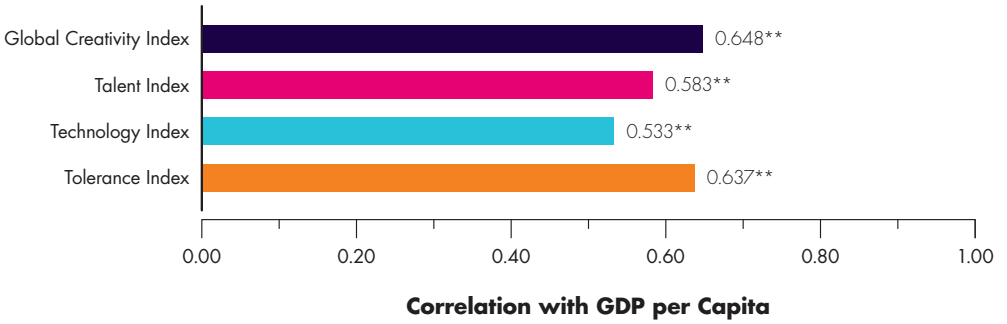
2.3 Creativity and entrepreneurship

Entrepreneurship is a key factor in competitiveness. Entrepreneurial startup companies power the great gales of creative destruction Schumpeter long ago identified as powering the rise of new industries and the broad process of economic growth and development.[21]

To capture entrepreneurship, we use at the Global Entrepreneurship Index, a broad measure of entrepreneurial activity across 130 nations.[22]

The correlation between the GCI and entrepreneurship (*Exhibit 16*) is even higher than that for GDP per capita or global competitiveness (0.83). Talent (0.81) is the strongest of the 3Ts followed closely by technology (0.72) and then tolerance (0.61).

The scatter graph (*Exhibit 17*) shows how individual nations stack up on the GCI and entrepreneurship. The fitted line once again slopes steeply upward, indicating the close relationship between the two. Note the cluster of nations in the upper right hand quadrant of the chart



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 12: The GCI and economic output correlations

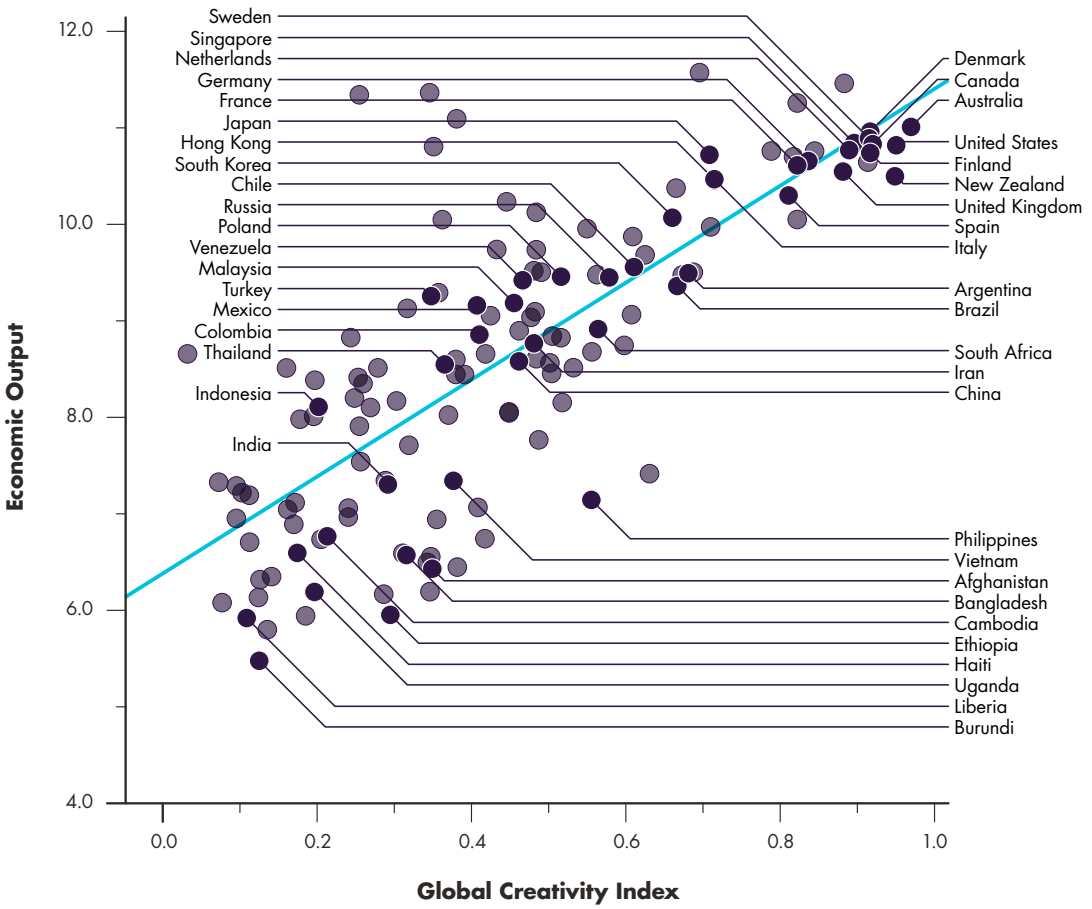
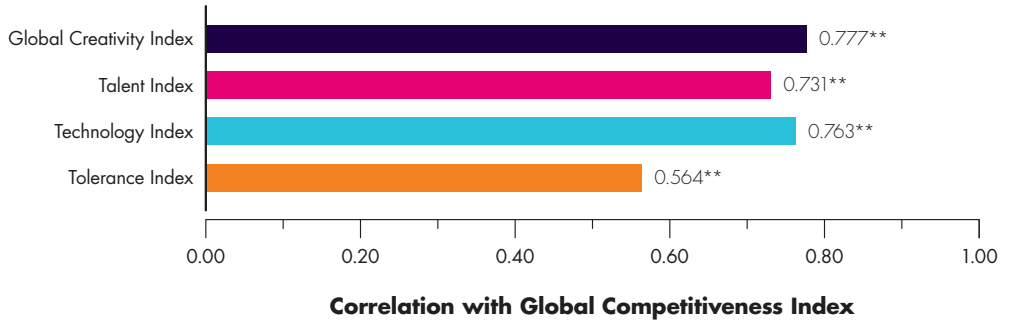


Exhibit 13: The GCI and economic output



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 14: The GCI and global competitiveness correlations

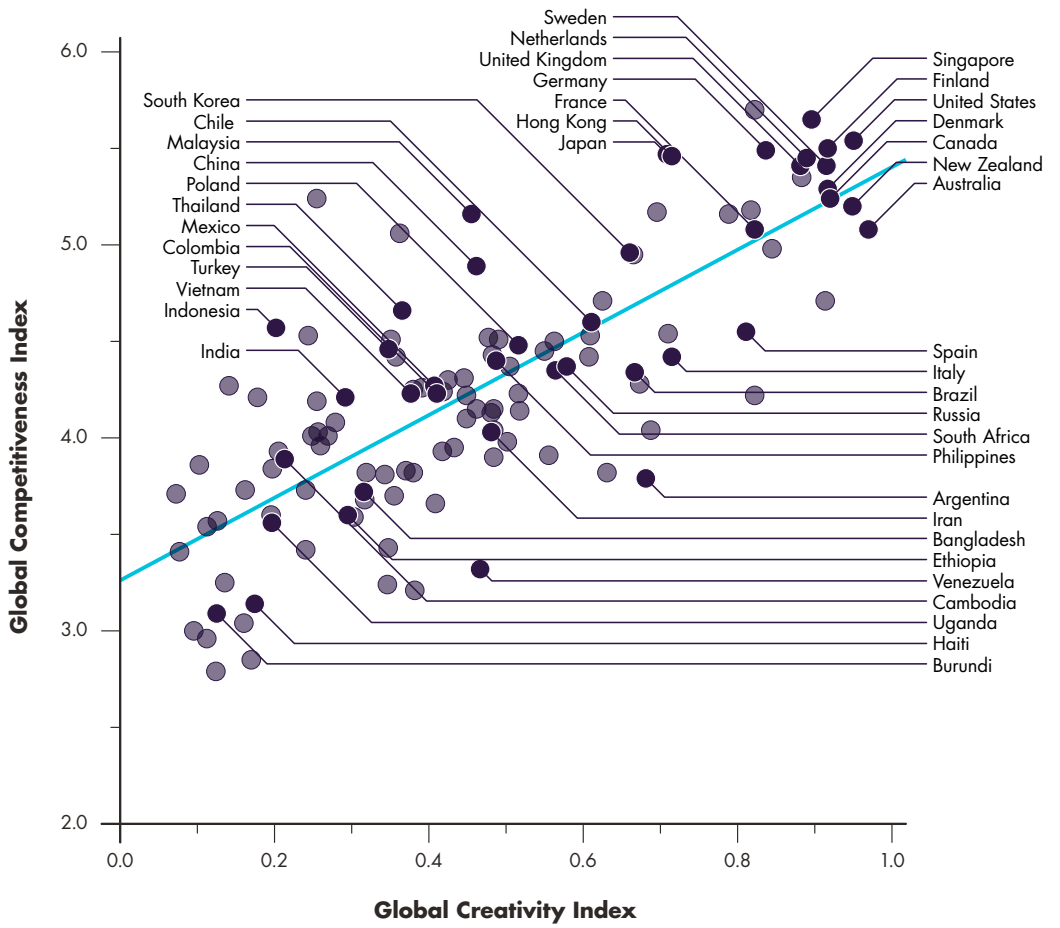
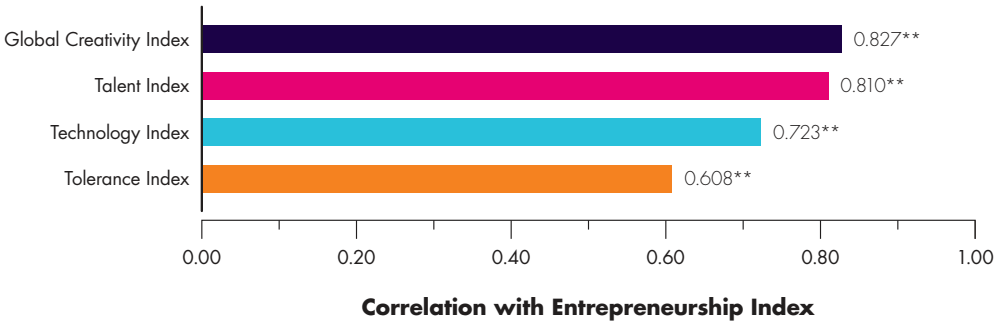


Exhibit 15: The GCI and global competitiveness



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 16: The GCI and global entrepreneurship correlations

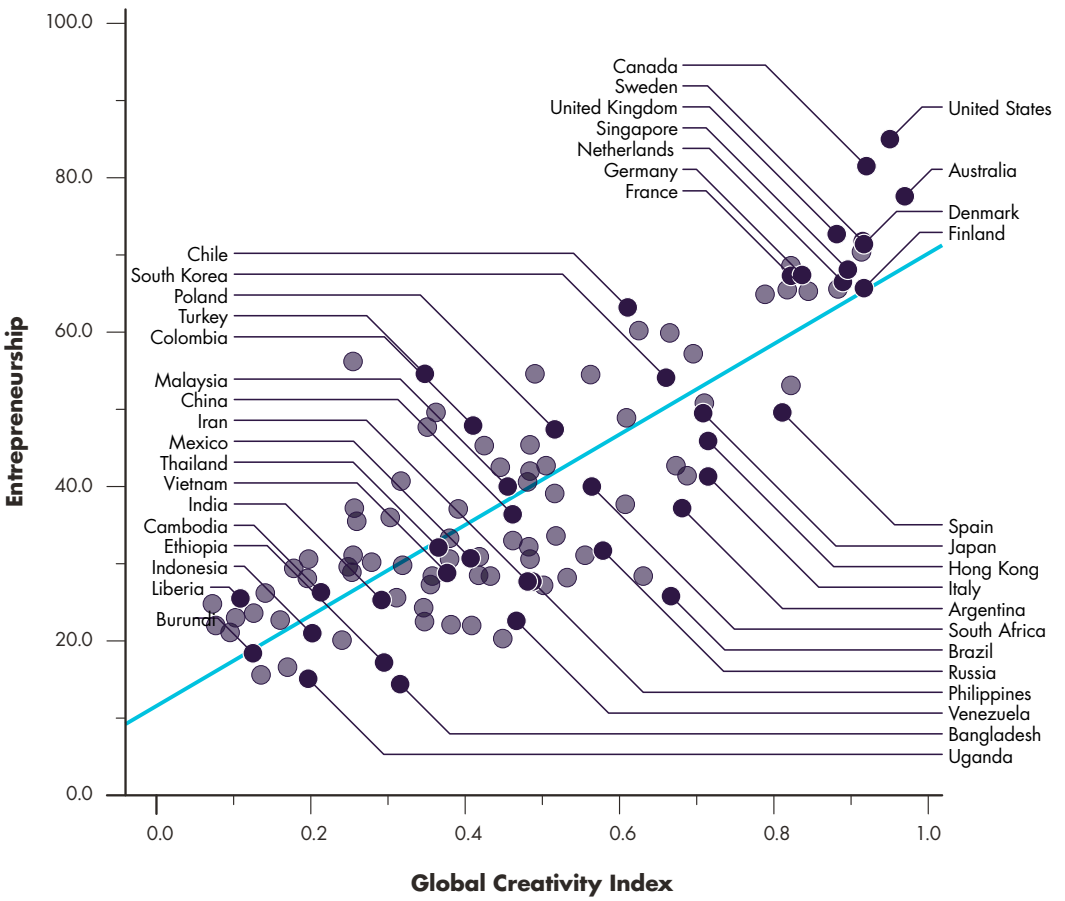


Exhibit 17: The GCI and global entrepreneurship

above the fitted line: the United States, Canada, Australia, the United Kingdom, Denmark, Sweden, Finland, France, Germany, and Singapore. Once again, in the bottom left we find poor countries like Uganda, Bangladesh, and the Philippines. Several of the BRICs — Brazil, Russia, and India — also cluster near the bottom of this chart.

2.4 Creativity and human development

The level of human development is a key factor in assessing a nation's social and economic progress.[23] We measure human development based on the United Nations' Human Development Index which tracks a wide variety of measures, including living standards, level of education, health outcomes, and life expectancy.[24]

As *Exhibit 18* shows, there is a strong and significant relationship between the GCI and human development (0.78). Of the 3Ts, talent (0.88) has the closest relationship to human development, followed by technology (0.72) and tolerance (0.50).

The scatter graph (*Exhibit 19*) arrays nations on the GCI and human development. Once again we find countries like Australia, the United States, Canada, New Zealand, and the Northern European and Scandinavian nations in the upper right hand quadrant of the chart. Again we find poor nations like Uganda, Burundi, Liberia, Haiti, and Ethiopia at the bottom left.

2.5 Creativity and urbanization

Our world is increasingly urban. More than half the global population lives in cities, a figure that is expected to grow to two-thirds by 2050.[25] Economists have long noted the connection between urbanization and economic development. The shift to the creative economy makes density and urbanization ever more important to innovation and economic performance.[26]

There is a close connection between the GCI and urbanization, which is measured as the share of population that lives in urban areas.[27] Nations that are more urbanized are also more creative.

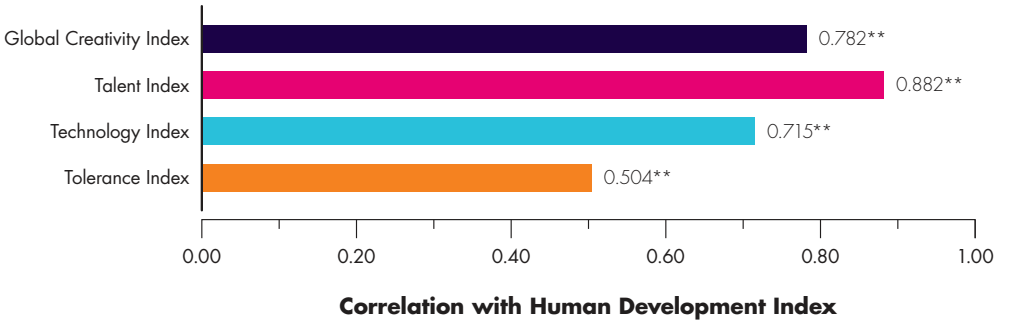
As *Exhibit 20* shows, the level of urbanization is positively correlated to both the GCI (0.62) and each of the 3Ts. Talent has the strongest correlation with urbanization (0.70); technology (0.56) is next, followed by tolerance (0.41).

The scatter graph (*Exhibit 21*) shows how individual nations line up on urbanization and creativity. Again, as the line slopes steeply upward, the GCI and urbanization go together. In the upper right hand quadrant we find Singapore, Denmark, Sweden, Finland, the Netherlands, the United States, Canada, Australia, and New Zealand. In the bottom left are poor nations like Trinidad and Tobago, Nepal, Ethiopia, and Kenya that have low levels of urbanization and creativity.

2.6 The GCI and inequality

Inequality has surged across the advanced industrial nations to levels not seen since the 1920s, according to recent studies.[28] For many economists, growing inequality is closely tied to the ongoing economic transformation from the industrial to the knowledge economy. With the decline of once high paying, family supporting manufacturing jobs in the advanced nations, the job market has cleaved into high paying knowledge jobs and much lower paid service work. Inequality is driven by growing returns to education and the process of "skill-biased technical change."[29]

We use the standard measure of income inequality, the Gini Coefficient, with data from the World Development Indicators.[30]



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 18: The GCI and human development correlations

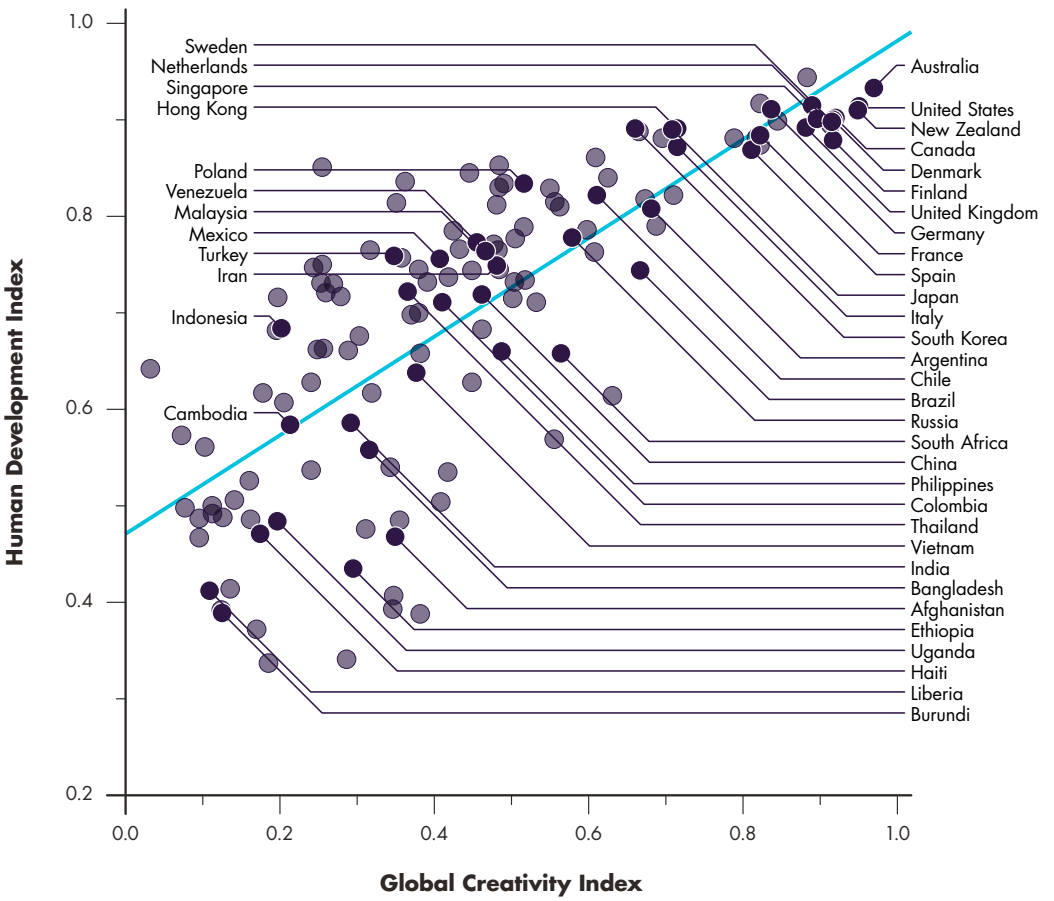
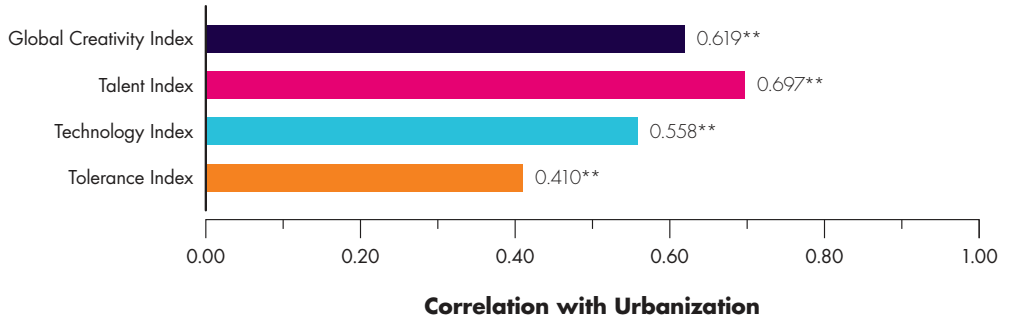


Exhibit 19: The GCI and human development



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 20: The GCI and urbanization correlations

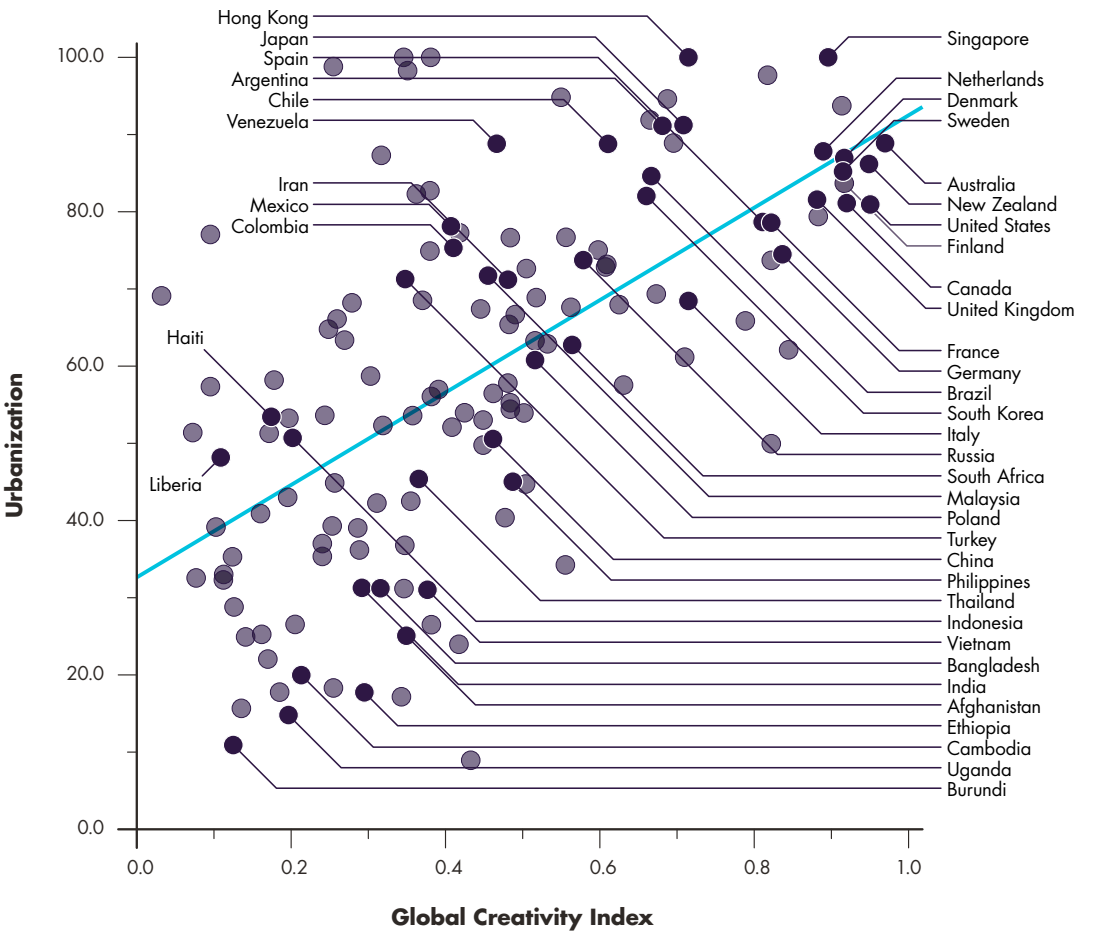
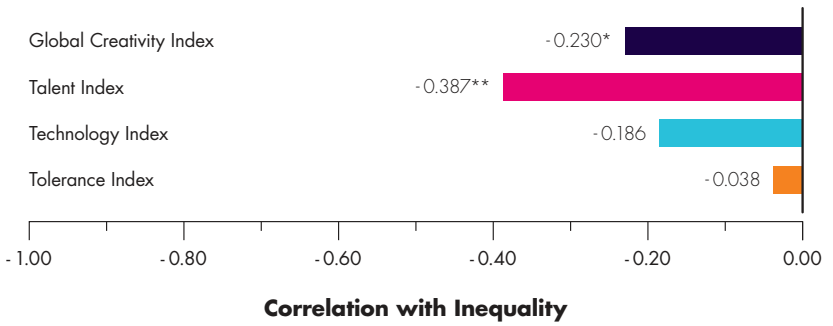


Exhibit 21: The GCI and urbanization

As *Exhibit 22* shows, the GCI is negatively associated with income inequality (-0.23). In other words, the higher a nation ranks on the GCI the lower its inequality. Of the 3Ts, talent (-0.39) has the strongest negative correlation with inequality, followed by technology (-0.19). The correlation between inequality and tolerance is not statistically significant.

The scatter graph (*Exhibit 23*) shows how individual nations line up in terms of income inequality and the GCI. While the overall relationship between the GCI and inequality is negative, there appears to be two distinct patterns among the advanced nations. In the bottom right hand corner of the graph are several countries — notably Sweden, Denmark, Finland, and the Netherlands — that combine high scores on the GCI with relatively low levels of inequality. These nations define a high-road path where greater creative competitiveness goes along with lower levels of inequality.[31] In the upper right hand corner of the graph are nations like the United Kingdom and the United States that have much higher levels of inequality alongside high scores on the GCI. These nations define a low road path where greater creative competitiveness goes along with relatively higher levels of inequality. This is in line with the results of a recent International Monetary Fund study that finds the redistribution of wealth both reduces economic inequality and spurs economic growth.[32] Overall then, high levels of creativity and relatively low levels of inequality can and do go together.



Note: ** indicates significance at the 1 percent level, * at the 5 percent level.

Exhibit 22: The GCI and economic inequality correlations

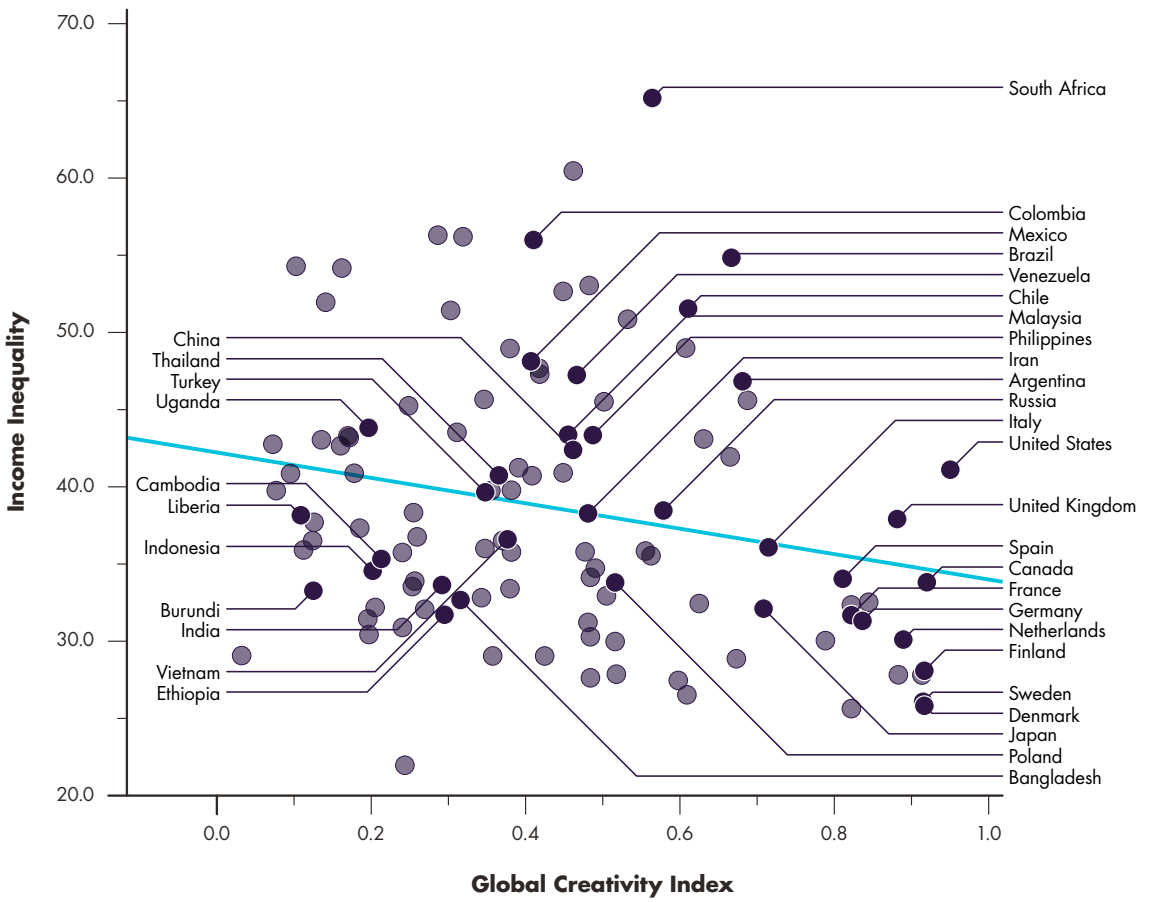


Exhibit 23: The GCI and economic inequality

Conclusion

Creativity is increasingly the cornerstone of innovation and economic progress for nations across the globe. This report updates and expands the Global Creativity Index — our basic measure of creative competitiveness and prosperity — for 139 nations worldwide.

Australia takes the top spot on the GCI followed by the United States in second, New Zealand third, and Canada fourth. Denmark and Finland are tied for fifth. Sweden, Iceland, Singapore, and the Netherlands round out the top ten.

There have been some notable changes since the previous 2011 edition of the GCI. Both Australia and New Zealand moved up considerably in this edition, Australia from fifth to first, and New Zealand from sixth to third. Canada also moved up from seventh to fourth. Sweden, which ranked first in both the 2011 and 2004 editions of the GCI, falls to seventh. In fact, most of the Scandinavian nations have seen their rankings decline slightly. Finland and Denmark, previously ranked third and fourth are now tied at fifth.

The BRIC nations continue to struggle. Brazil fares best, ranking 29th, Russia ranks 38th, China 62nd, and India 99th.

The creative class is a key factor in innovation and economic growth. Luxembourg has the largest share of the creative class (54 percent). Bermuda is second (48 percent), and Singapore third (47 percent), down from first in 2011. Switzerland (47 percent) is fourth and Iceland (45 percent) is fifth. Rounding out the top ten are Australia (45 percent), Sweden (45 percent), the Netherlands (44 percent), Canada (44 percent), and the United Kingdom (44 percent). The United States is 34th with 33 percent.

When it comes to each of the 3Ts — talent, technology, and tolerance — the world leaders are as follows:

South Korea leads in technology. Japan is second, Israel third, the United States fourth, and Finland is fifth. Australia, New Zealand, Germany, Singapore, and Denmark round out the top ten.

Australia leads in talent. Iceland is second. The United States and Finland are tied for third with Singapore fifth. Denmark, Slovenia, Belarus, New Zealand, and Sweden round out the top ten.

Canada takes the top spot in tolerance measured as openness to ethnic and religious minorities and gay and lesbian people. Iceland is second, New Zealand third, Australia fourth, and the United Kingdom fifth. The Netherlands, Uruguay, Ireland, Norway, and Sweden round out the top ten.

The GCI is closely associated with key measures of economic and social progress. Nations that score highly on the GCI have higher levels of economic output, entrepreneurship, economic competitiveness, and overall human development. Creativity is also closely associated with urbanization, with more urbanized nations scoring higher on the GCI.

Overall, we find that nations that 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. Generally speaking, higher levels of global creativity are associated with lower levels of inequality. This goes both ways: nations that invest in creativity tend to be more equal societies and more equal societies tend to invest more in creativity. Harnessing creativity can help to mitigate the increasing global wealth that many countries currently experience.

There are two distinctive paths to balancing creative economic growth and inequality. The high road path associated with the Scandinavian nations combines high levels of creative competitiveness with relatively low levels of inequality. The low road path associated with the United States and the United Kingdom combines high levels of creative competitiveness with much higher levels of inequality. In other words, there is no necessary relationship between creative competitiveness and inequality. In fact, nations can essentially choose to take the high road or low road paths. Moreover, it suggests that a high-road path to prosperity where the fruits of economic progress are more broadly shared is not only possible, but that it can actually be better for economic performance.

The data in this report cover 139 nations for the period of 2010 to 2014. We sometimes use different years for different variables and utilize running averages, depending on the availability of data. The following describes the main variables and data sources used in this report.

Creativity and the 3Ts of Economic Development

We employ the following measures for the 3Ts — technology, talent, and tolerance:

Global technology

We use two variables for technology: R&D investment and innovation (patents).

Global R&D investment

This variable measures R&D investment as a share of economic output or GDP. R&D investment includes R&D expenditures for basic research, applied research, and experimental development. The data are from the World Bank's World Development Indicators[33] for the period 2010–2012.

Global innovation

Our variable for global innovation is based on patent applications per million people. The data are from the World Development Indicators[34] for the period 2010–2012.

The Global Technology Index

The Global Technology Index combines these two variables into a single measure. It is based on the ranks of the variables; a country must have a value for at least one of the two variables in order to create a Global Technology Index score. The correlation between R&D investment and global innovation is 0.569 and significant at the 1 percent level. It is worth noting that these variables differ from the 2011 version of the index which was based on R&D investment as a share of GDP, researchers per capita and granted patents per capita (based on data from the USPTO).

Global talent

We employ two measures of talent — one that captures the creative class, the other based on educational attainment.

Global creative class

The creative class measure is calculated as the share of a country's labor force that is engaged in creative occupations spanning computer science and mathematics; architecture, engineering; life, physical, and the social sciences; education, training, and library science; arts and design, entertainment, sports, and media; and management, business and finance, law, sales management, and healthcare. It is based on data from the International Labour Organization, covering the years 2010 to 2012 (except for Singapore and New Zealand, where the values are for the period 2004–2007).[35]

Global educational attainment

This variable is based on participation in post-secondary education. We use the standard measure of "tertiary education" which includes universities, colleges, community colleges, technical training institutes, and other post-secondary institutions. Specifically, we use the conventional measure of the "gross tertiary enrollment ratio," which is the ratio of all

those involved in tertiary education compared to the age group spanning five years after leaving secondary school. The data are from World Development Indicators for the period 2010 to 2012.[36]

The Global Talent Index
The talent index combines these two variables in a single index based on the rank of each. The correlation between the creative class and educational attainment variables is 0.637

Global tolerance
We employ two measures of tolerance based on surveys of attitudes toward ethnic and racial minorities and gay and lesbian people.

Global tolerance toward ethnic and racial minorities
The variable is based on the survey question "Is your city or area a good or bad place to be in for ethnic and racial minorities?" conducted by the Gallup Organization's World Poll. Our measure reflects the share of the respondents who said their's is a good place for these groups. According to Gallup, the World Poll survey is based on approximately 1,000 interviews per country (adjusted for population size) conducted in approximately 150 countries. The data are for 2014.

Global tolerance toward gay and lesbian people
This variable is based on the Gallup World Poll question "Is your city or area a good or bad place to be in for gay and lesbian people?" Our measure reflects the share of the respondents who said their's is a good place. The data are for 2012.

The Global Tolerance Index
The tolerance index is based on the two measures above. Based on their ranks, the two variables are equally weighted into the tolerance index. The two variables correlate by 0.286 and are significant at the 1 percent level. A country must have a value for at least one of the two tolerance variables to receive a Global Tolerance Index score.

The Global Creativity Index
The Global Creativity Index is a composite of the 3Ts. It is based on the ranks of the each of the three overall indexes for talent, technology, and tolerance. We ranked each by giving the highest value to the top performer. We then added the ranks together and divided by three. In cases where a value for only two of the three variables was available, these two were added and divided by two. To create the Global Creativity Index score, the average score of the 3Ts was divided by the number of observations overall.

Economic and social development measures

We employ the following measures of economic and social development:

Economic Output/Productivity
We employ the conventional measure of productivity based on economic output per person and measured as Gross Domestic Product (GDP) per capita. The value is an average for the years 2010 to 2012 from World Development Indicators.[37]

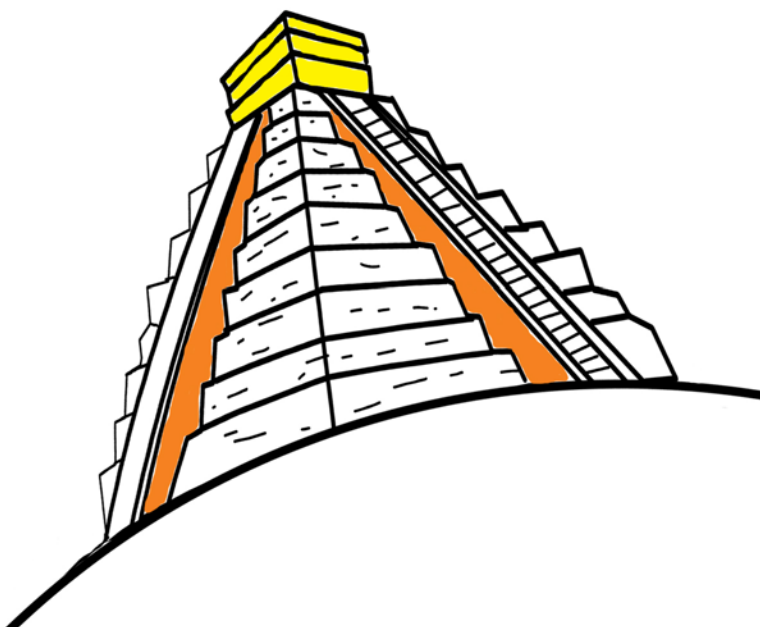
Economic competitiveness
We use the Global Competitiveness Index developed by Michael Porter for the World Economic Forum.[38] It is based on the following categories: basic requirements (including institutions, infrastructure, macroeconomic stability, health, and primary education), efficiency enhancers (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).

Global entrepreneurship
This variable is from the most recent Global Entrepreneurship Index by Zoltan Acs, Laszlo Szerb, and Erkko Autio.[39] The index is based on several measures of entrepreneurial attitudes, activity, and aspiration.

Human development
This variable is from the most recent edition of the United Nations Human Development Index, a composite measure which aims to capture three core dimensions of human development: health and measured life expectancy, education level, and standard of living. [40]

Urbanization
This variable is the urban share of population. It is based on data from the World Bank's World Development Indicators.[41] It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects.

Income inequality
This variable is based on the standard measure of income inequality — the Gini Coefficient — which measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. A Gini Coefficient of 0 represents absolute equality, while an index of 100 implies absolute inequality. The data is from the World Development Indicators and is an average for the years 2004–2013.[42]



Data Appendix

THE GLOBAL TECHNOLOGY INDEX			
Country	**R&D Investment**	**Patents per Capita**	**Technology Index**
South Korea	3	1	1
Japan	5	2	2
Israel	1	9	3
United States	8	5	4
Finland	2	14	5
Australia	10	7	7
New Zealand	—	6	7
Germany	7	10	7
Singapore	13	3	7
Denmark	6	15	10
Sweden	4	19	11
Austria	9	16	12
Canada	18	8	13
China	17	11	14
United Kingdom	19	12	15
France	12	20	16
Slovenia	11	23	17
Norway	22	13	18
Switzerland	—	17	19
Netherlands	16	29	20
Luxembourg	24	21	20
Russian Federation	29	18	22
Ireland	20	32	23
Malaysia	30	22	24
Italy	26	30	25
Iceland	—	26	26
Brazil	28	31	27
Belgium	14	46	28
Czech Republic	21	43	29
South Africa	—	33	30

Appendix 1: Global technology rankings

THE GLOBAL TECHNOLOGY INDEX			
Country	**R&D Investment**	**Patents per Capita**	**Technology Index**
Spain	25	45	31
Hong Kong	36	4	32
Estonia	15	58	33
Hungary	27	47	34
Portugal	23	54	35
Georgia	—	44	35
Jordan	—	48	37
Thailand	—	51	38
Greece	—	52	39
Venezuela	—	57	40
Belarus	39	25	41
Jamaica	—	59	42
Ecuador	—	62	43
Ukraine	33	37	43
Vietnam	—	64	45
Poland	34	40	46
Costa Rica	47	28	47
Uruguay	55	24	48
Argentina	43	36	48
Saudi Arabia	—	70	50
Montenegro	54	27	51
India	—	71	52
Philippines	—	72	54
Mexico	49	35	54
Latvia	42	42	54
Chile	52	34	56
Nicaragua	—	73	56
Turkey	32	56	58
Qatar	—	75	58
Honduras	—	76	60

Appendix 1: Global technology rankings, continued

THE GLOBAL TECHNOLOGY INDEX			
Country	**R&D Investment**	**Patents per Capita**	**Technology Index**
Croatia	37	53	60
Peru	—	77	62
Mozambique	50	—	63
Dominican Republic	—	79	63
Romania	48	49	65
Lithuania	31	66	65
Indonesia	—	81	67
Algeria	—	83	68
Slovak Republic	41	61	69
Panama	63	41	70
Serbia	35	68	70
Kazakhstan	67	38	72
Malta	40	65	73
Uzbekistan	—	86	74
Mongolia	58	50	75
Macedonia	—	88	76
Bosnia and Herzegovina	—	89	77
Bulgaria	45	67	78
Morocco	38	74	78
Rwanda	—	91	80
Macao	76	39	80
Kenya	—	92	82
Albania	—	94	83
Armenia	59	60	83
Moldova	51	69	85
Yemen	—	95	86
Cambodia	—	96	87
Haiti	—	97	88
Colombia	64	63	89
Paraguay	73	55	90

Appendix 1: Global technology rankings, continued

THE GLOBAL TECHNOLOGY INDEX			
Country	**R&D Investment**	**Patents per Capita**	**Technology Index**
Bangladesh	—	99	90
Zambia	—	100	92
Egypt	53	78	93
Cuba	44	87	94
Cote d'Ivoire	—	101	94
Cyprus	46	90	96
Nepal	57	—	97
Azerbaijan	62	82	98
Pakistan	56	93	100
Kyrgyz Republic	66	84	100
Sri Lanka	65	85	100
Guatemala	77	80	102
Ethiopia	60	—	103
Bermuda	61	—	104
Madagascar	69	98	105
Tajikistan	70	102	106
Burundi	68	—	107
Kuwait	71	—	108
El Salvador	72	—	109
Iraq	74	—	110
Trinidad and Tobago	75	—	111
Lesotho	78	—	112

Appendix 1: Global technology rankings, continued

THE GLOBAL TALENT INDEX			
Country	**Creative Class**	**Educational Attainment**	**Talent Index**
Australia	6	6	1
Iceland	5	9	2
United States	34	2	3
Finland	15	3	3
Singapore	3	—	5
Denmark	12	14	6
New Zealand	18	8	8
Sweden	7	19	8
Slovenia	21	4	8
Belarus	—	5	8
Netherlands	8	20	11
Norway	11	18	12
Lithuania	17	12	12
Canada	9	—	14
Russian Federation	19	15	15
Estonia	20	16	16
Cuba	27	10	17
Belgium	14	24	18
Spain	36	7	19
United Kingdom	10	33	20
Ireland	23	21	21
Switzerland	4	44	22
Latvia	22	25	22
Ukraine	40	11	24
Poland	33	17	25
France	13	41	26
Austria	30	22	26
Germany	16	38	28
Israel	26	27	28
Czech Republic	29	28	30

Appendix 2: Global talent rankings

THE GLOBAL TALENT INDEX			
Country	**Creative Class**	**Educational Attainment**	**Talent Index**
Italy	31	29	31
Hong Kong	24	37	32
Hungary	32	35	33
Montenegro	25	42	34
Argentina	55	13	35
Portugal	46	26	36
Guatemala	35	—	37
Bulgaria	45	34	38
Chile	53	23	39
Croatia	42	39	39
Bermuda	2	70	41
Slovak Republic	—	43	42
Greece	43	—	43
Cyprus	37	52	44
Uruguay	57	30	45
Serbia	44	47	45
Mongolia	50	40	47
Luxembourg	1	85	48
Malta	28	62	49
South Korea	78	1	50
Armenia	—	48	50
Trinidad and Tobago	48	—	52
Turkey	62	32	53
Kazakhstan	38	59	54
Lebanon	—	51	55
Macao	65	31	56
Moldova	39	61	57
Japan	64	36	58
Saudi Arabia	—	54	59
Romania	60	45	60

Appendix 2: Global talent rankings, continued

THE GLOBAL TALENT INDEX			
Country	**Creative Class**	**Educational Attainment**	**Talent Index**
Costa Rica	52	53	61
South Africa	54	—	62
Macedonia	47	63	63
Jordan	—	57	63
Philippines	56	—	65
Egypt	41	69	66
Panama	58	55	67
Brazil	61	—	68
Malaysia	49	66	69
Bosnia and Herzegovina	—	64	70
Iran	69	49	71
Tunisia	59	67	72
Botswana	66	—	73
Kyrgyz Republic	67	60	74
Colombia	68	58	75
Mauritius	63	65	76
Algeria	—	71	77
Azerbaijan	51	84	78
Peru	74	56	79
Jamaica	—	72	79
Dominican Republic	70	—	81
Georgia	—	73	82
Venezuela	72	—	83
Thailand	81	46	84
Syrian Arab Republic	—	76	85
Paraguay	73	68	86
China	—	77	87
Belize	—	80	88
Ecuador	77	—	90
Albania	83	50	90

Appendix 2: Global talent rankings, continued

THE GLOBAL TALENT INDEX			
Country	**Creative Class**	**Educational Attainment**	**Talent Index**
Tajikistan	—	81	90
India	—	82	92
Honduras	—	83	93
Mexico	75	75	94
Ethiopia	79	—	95
Sri Lanka	71	87	96
Laos	—	86	97
Morocco	—	88	98
Nepal	—	90	99
El Salvador	80	78	100
Bangladesh	76	91	101
Benin	—	92	101
Cameroon	—	94	103
Lesotho	—	96	104
Vietnam	82	79	104
Yemen	—	97	106
Zambia	87	—	107
Uganda	—	100	108
Indonesia	86	74	108
Pakistan	—	101	110
Uzbekistan	—	102	111
Senegal	—	103	112
Angola	—	104	113
Mali	—	105	114
Cote d'Ivoire	—	107	115
Ghana	84	93	116
Mozambique	—	109	117
Cambodia	90	89	118
Mauritania	—	110	119
Djibouti	—	111	120

Appendix 2: Global talent rankings, continued

THE GLOBAL TALENT INDEX			
Country	**Creative Class**	**Educational Attainment**	**Talent Index**
Liberia	85	98	121
Burkina Faso	—	112	122
Qatar	89	95	122
Afghanistan	—	114	124
Burundi	—	115	125
Guinea	93	99	126
Tanzania	—	116	127
Central African Republic	—	117	128
Zimbabwe	88	108	129
Chad	—	118	130
Rwanda	91	106	130
Niger	—	119	132
Malawi	—	120	133
Madagascar	92	113	134

Appendix 2: Global talent rankings, continued

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
Canada	3	2	1
Iceland	5	4	2
New Zealand	1	11	3
Australia	9	8	4
United Kingdom	11	6	5
Netherlands	18	1	6
Uruguay	15	5	7
Ireland	14	7	7
Norway	4	17	9
Sweden	13	12	10

Appendix 3: Global tolerance rankings

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
United States	20	9	11
Spain	29	3	12
Denmark	19	13	13
Belgium	24	14	14
Brazil	17	22	15
France	23	23	16
Switzerland	31	19	17
Germany	30	21	18
Argentina	32	20	19
Finland	41	18	20
Costa Rica	34	24	20
Portugal	28	33	22
Laos	26	41	23
Singapore	6	58	23
Malta	55	15	25
Ecuador	25	45	25
Nicaragua	44	27	27
Trinidad and Tobago	36	37	28
Nepal	10	62	29
Hong Kong	51	28	30
Chile	60	26	31
Luxembourg	71	16	32
Austria	53	34	32
Panama	49	39	34
Slovenia	46	43	35
Colombia	57	35	36
Cuba	—	30	37
Italy	68	29	38
Japan	54	47	39
Kuwait	52	—	39

Appendix 3: Global tolerance rankings, continued

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
Hungary	42	59	41
Ethiopia	59	—	42
Bangladesh	7	99	43
Guatemala	48	63	44
Cyprus	70	46	45
Burkina Faso	2	109	46
Bulgaria	66	54	47
Belize	50	71	48
Jamaica	45	79	49
El Salvador	94	32	50
Mozambique	83	44	50
Kenya	37	87	52
Philippines	102	25	53
Pakistan	78	53	54
Afghanistan	21	104	54
Mexico	89	42	56
South Africa	96	36	57
Serbia	65	66	58
Cameroon	33	100	59
Peru	88	48	60
Venezuela	106	31	61
Sri Lanka	16	117	61
Uzbekistan	22	110	64
Senegal	12	121	64
Mali	8	125	64
Slovak Republic	81	55	66
Central African Republic	47	90	67
Mauritius	—	61	68
Paraguay	103	38	69
Macedonia	132	10	70

Appendix 3: Global tolerance rankings, continued

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
South Korea	58	82	70
Iran	86	—	72
Vietnam	67	76	73
Dominican Republic	97	49	74
Botswana	84	60	75
Romania	73	74	76
Latvia	79	69	77
Cambodia	85	64	78
Georgia	43	105	78
Czech Republic	113	40	80
Croatia	87	65	81
Lesotho	—	73	82
Montenegro	76	80	83
Syrian Arab Republic	109	50	84
Tajikistan	27	129	85
Benin	40	118	86
Estonia	104	56	87
Honduras	111	51	89
Burundi	38	122	89
Niger	39	123	89
Cote d'Ivoire	35	126	89
Azerbaijan	63	106	92
Israel	121	52	93
Kyrgyz Republic	61	111	94
Chad	56	119	95
China	90	83	96
Belarus	82	93	97
Mongolia	95	84	98
Kazakhstan	77	101	98
Greece	115	67	101

Appendix 3: Global tolerance rankings, continued

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
Poland	112	70	101
Malaysia	75	107	101
Malawi	69	112	101
Thailand	127	57	105
Lithuania	105	77	105
Ukraine	98	85	105
Madagascar	—	98	107
India	92	91	108
Uganda	72	113	109
Tanzania	110	78	110
Guinea	80	108	111
Zimbabwe	74	114	111
Rwanda	62	127	113
Angola	108	81	114
Indonesia	64	128	115
Algeria	126	68	116
Haiti	122	72	117
Albania	107	88	118
Bosnia and Herzegovina	100	94	119
Liberia	125	75	120
Morocco	93	102	120
Saudi Arabia	124	—	122
Turkey	120	86	123
Russian Federation	114	89	123
Djibouti	91	115	125
Mauritania	119	95	126
Jordan	128	—	127
Moldova	117	97	128
Zambia	101	116	129
Iraq	123	96	130

Appendix 3: Global tolerance rankings, continued

THE GLOBAL TOLERANCE INDEX			
Country	**Racial and Ethnic Minorities**	**Gays and Lesbians**	**Tolerance Index**
Tunisia	129	92	131
Lebanon	118	103	132
Armenia	99	124	133
Egypt	130	—	134
Yemen	131	—	135
Ghana	116	120	136

Appendix 3: Global tolerance rankings, continued

THE GLOBAL CREATIVITY INDEX					
Rank	**Country**	**Technology**	**Talent**	**Tolerance**	**Global Creativity Index**
1	Australia	7	1	4	0.970
2	United States	4	3	11	0.950
3	New Zealand	7	8	3	0.949
4	Canada	13	14	1	0.920
5	Denmark	10	6	13	0.917
5	Finland	5	3	20	0.917
7	Sweden	11	8	10	0.915
8	Iceland	26	2	2	0.913
9	Singapore	7	5	23	0.896
10	Netherlands	20	11	6	0.889
11	Norway	18	12	9	0.883
12	United Kingdom	15	20	5	0.881
13	Ireland	23	21	7	0.845
14	Germany	7	28	18	0.837
16	Switzerland	19	22	17	0.822
16	France	16	26	16	0.822
16	Slovenia	17	8	35	0.822
18	Belgium	28	18	14	0.817
19	Spain	31	19	12	0.811
20	Austria	12	26	32	0.788

Appendix 4: Overall Global Creativity Index rankings

THE GLOBAL CREATIVITY INDEX					
Rank	**Country**	**Technology**	**Talent**	**Tolerance**	**Global Creativity Index**
21	Hong Kong	32	32	30	0.715
21	Italy	25	31	38	0.715
23	Portugal	35	36	22	0.710
24	Japan	2	58	39	0.708
25	Luxembourg	20	48	32	0.696
26	Uruguay	48	45	7	0.688
27	Argentina	48	35	19	0.681
28	Hungary	34	33	41	0.673
29	Brazil	27	68	15	0.667
30	Israel	3	28	93	0.665
31	South Korea	1	50	70	0.660
32	Nicaragua	56	—	27	0.631
33	Estonia	33	16	87	0.625
34	Chile	56	39	31	0.611
35	Czech Republic	29	30	80	0.609
36	Costa Rica	47	61	20	0.607
37	Belarus	41	8	97	0.598
38	Russian Federation	22	15	123	0.579
39	South Africa	30	62	57	0.564
40	Latvia	54	22	77	0.563
41	Cuba	94	17	37	0.556
42	Laos	—	97	23	0.555
43	Malta	73	49	25	0.550
44	Ecuador	43	90	25	0.532
45	Ukraine	43	24	105	0.518
46	Poland	46	25	101	0.516
46	Montenegro	51	34	83	0.516
48	Bulgaria	78	38	47	0.505
49	Belize	—	88	48	0.504
50	Jamaica	42	79	49	0.502

Appendix 4: Overall Global Creativity Index rankings, continued

THE GLOBAL CREATIVITY INDEX					
Rank	**Country**	**Technology**	**Talent**	**Tolerance**	**Global Creativity Index**
51	Lithuania	65	12	105	0.490
52	Philippines	54	65	53	0.487
54	Slovak Republic	69	42	66	0.484
54	Serbia	70	45	58	0.484
54	Greece	39	43	101	0.484
56	Panama	70	67	34	0.482
57	Iran	—	71	72	0.481
58	Croatia	60	39	81	0.481
59	Mauritius	—	76	68	0.477
60	Venezuela	40	83	61	0.466
61	Botswana	—	73	75	0.462
62	China	14	87	96	0.462
63	Malaysia	24	69	101	0.455
64	Guatemala	102	37	44	0.449
64	Georgia	35	82	78	0.449
66	Cyprus	96	44	45	0.446
67	Trinidad and Tobago	111	52	28	0.433
68	Romania	65	60	76	0.425
69	Peru	62	79	60	0.418
70	Kenya	82	—	52	0.417
71	Colombia	89	75	36	0.410
72	Cameroon	—	103	59	0.408
73	Mexico	54	94	56	0.407
74	Macedonia	76	63	70	0.391
75	Syrian Arab Republic	—	85	84	0.382
75	Burkina Faso	—	122	46	0.382
77	Macao	80	56	—	0.381
78	Dominican Republic	63	81	74	0.380
78	Jordan	37	63	127	0.380
80	Vietnam	45	104	73	0.377

Appendix 4: Overall Global Creativity Index rankings, continued

THE GLOBAL CREATIVITY INDEX					
Rank	**Country**	**Technology**	**Talent**	**Tolerance**	**Global Creativity Index**
81	Mongolia	75	47	98	0.370
82	Thailand	38	84	105	0.365
83	Saudi Arabia	50	59	122	0.362
84	Kazakhstan	72	54	98	0.357
85	Senegal	—	112	64	0.355
86	Kuwait	108	—	39	0.351
87	Afghanistan	—	124	54	0.349
88	Turkey	58	53	123	0.348
89	Mali		114	64	0.347
90	Mozambique	63	117	50	0.346
91	Bermuda	104	41	—	0.346
92	Nepal	97	99	29	0.343
93	Honduras	60	93	89	0.319
94	Lebanon	—	55	132	0.317
95	Bangladesh	90	101	43	0.316
96	Benin	—	101	86	0.311
97	Paraguay	90	86	69	0.303
98	Ethiopia	103	95	42	0.295
99	India	52	92	108	0.292
100	Uzbekistan	74	111	64	0.288
101	Central African Republic	—	128	67	0.286
102	Algeria	68	77	116	0.279
103	Armenia	83	50	133	0.269
104	Tunisia	—	72	131	0.260
105	Moldova	85	57	128	0.256
106	Sri Lanka	100	96	61	0.255
107	Qatar	58	122	—	0.255
108	Bosnia and Herzegovina	77	70	119	0.253
109	El Salvador	109	100	50	0.248
110	Azerbaijan	98	78	92	0.244

Appendix 4: Overall Global Creativity Index rankings, continued

THE GLOBAL CREATIVITY INDEX					
Rank	**Country**	**Technology**	**Talent**	**Tolerance**	**Global Creativity Index**
111	Pakistan	100	110	54	0.240
111	Kyrgyz Republic	100	74	94	0.240
113	Cambodia	87	118	78	0.213
114	Tajikistan	106	90	85	0.205
115	Indonesia	67	108	115	0.202
116	Albania	83	90	118	0.197
117	Uganda	—	108	109	0.197
118	Egypt	93	66	134	0.196
119	Niger	—	132	89	0.185
120	Morocco	78	98	120	0.178
121	Haiti	88	—	117	0.174
122	Cote d'Ivoire	94	115	89	0.171
123	Chad	—	130	95	0.170
124	Lesotho	112	104	82	0.162
125	Angola	—	113	114	0.160
126	Rwanda	80	130	113	0.141
127	Malawi	—	133	101	0.135
128	Tanzania	—	127	110	0.126
129	Burundi	107	125	89	0.125
130	Guinea	—	126	111	0.124
131	Zimbabwe	—	129	111	0.113
132	Yemen	86	106	135	0.112
133	Liberia	—	121	120	0.109
134	Zambia	92	107	129	0.103
135	Mauritania	—	119	126	0.095
135	Djibouti	—	120	125	0.095
137	Madagascar	105	134	107	0.077
138	Ghana	—	116	136	0.073
139	Iraq	110	—	130	0.032

Appendix 4: Overall Global Creativity Index rankings, continued

CREATIVE CLASS SHARE		
Rank	**Country**	**Creative Class Share**
1	Luxembourg	53.68
2	Bermuda	47.96
3	Singapore	47.30
4	Switzerland	46.53
5	Iceland	45.43
6	Australia	44.98
7	Sweden	44.92
8	Netherlands	44.25
9	Canada	43.86
10	United Kingdom	43.60
11	Norway	43.32
12	Denmark	42.84
13	France	42.73
14	Belgium	42.35
15	Finland	42.25
16	Germany	40.52
17	Lithuania	40.14
18	New Zealand	40.11
19	Russian Federation	39.41
20	Estonia	39.31
21	Slovenia	39.00
22	Latvia	38.07
23	Ireland	37.64
24	Hong Kong	37.18
25	Montenegro	36.97
26	Israel	36.83
27	Cuba	36.55
28	Malta	36.35
29	Czech Republic	35.76
30	Austria	35.46

Appendix 5: Global creative class rankings

CREATIVE CLASS SHARE		
Rank	**Country**	**Creative Class Share**
31	Italy	34.29
32	Hungary	33.32
33	Poland	33.11
34	United States	32.61
35	Guatemala	31.40
36	Spain	31.28
37	Cyprus	30.92
38	Kazakhstan	30.80
39	Moldova	30.37
40	Ukraine	29.75
41	Egypt	29.50
42	Croatia	29.17
43	Greece	28.87
44	Serbia	28.78
45	Bulgaria	27.60
46	Portugal	26.36
47	Macedonia	25.65
48	Trinidad and Tobago	25.00
49	Malaysia	24.05
50	Mongolia	23.83
51	Azerbaijan	23.67
52	Costa Rica	23.54
53	Chile	22.93
54	South Africa	22.50
55	Argentina	22.05
56	Philippines	21.33
57	Uruguay	21.12
58	Panama	20.73
59	Tunisia	20.58
60	Romania	20.36

Appendix 5: Global creative class rankings, continued

CREATIVE CLASS SHARE		
Rank	**Country**	**Creative Class Share**
61	Brazil	20.12
62	Turkey	18.89
63	Mauritius	18.82
64	Japan	18.65
65	Macao	18.56
66	Botswana	17.92
67	Kyrgyz Republic	17.47
68	Colombia	16.82
69	Iran	15.99
70	Dominican Republic	15.20
71	Sri Lanka	14.94
72	Venezuela	14.91
73	Paraguay	14.70
74	Peru	14.32
75	Mexico	13.15
76	Bangladesh	12.82
77	Ecuador	12.40
78	South Korea	12.00
79	Ethiopia	11.27
80	El Salvador	11.20
81	Thailand	9.85
82	Vietnam	9.83
83	Albania	9.23
84	Ghana	8.61
85	Liberia	8.42
86	Indonesia	7.95
87	Zambia	7.28
88	Zimbabwe	6.61
89	Qatar	6.50
90	Cambodia	3.98
91	Rwanda	3.76
92	Madagascar	2.85
93	Guinea	0.75

Appendix 5: Global creative class rankings, continued

References

1 See, Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting*, New York: Basic Books, 1973; Peter F. Drucker, *The Age of Discontinuity: Guidelines to Our Changing Society*, New York: Harper & Row, 1969; Drucker, *Post-Capitalist Society*, New York: HarperCollins, 1993; Fritz Machlup, *The Production and Distribution of Knowledge in the United States*, Princeton, NJ: Princeton University Press, 1962.

2 Smith long ago identified the "acquired and useful abilities of all the inhabitants or members of the society" as something akin to a "fourth factor of production" operating alongside land, labor, and production, noting that: "The greatest improvement in the productive powers of labour, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labour"(Adam Smith, *The Wealth of Nations,* An Inquiry into the Nature and Causes of the Wealth of Nations, 2nd ed., Great Books of the Western World, Chicago, London: Encyclopedia Britannica, 1990, book 1, page 7).

3 Paul Romer, "Increasing Returns and Long-run Growth," *Journal of Political Economy*, 90, 1986, pp. 1002–37.

4 See, Jane Jacobs, *The Economy of Cities*, New York: Vintage, 1970, p. 268; Jacobs, *Cities and the Wealth of Nations: Principles of Economic Life*, New York: Vintage, 1985, p. ix, 257.

5 See, Richard Florida, *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*, New York: Basic Books, 2002; Florida, *The Rise of the Creative Class — Revisited*, New York: Basic Books, 2012.

6 Florida, 2002, 2012.

7 Karl Marx, *Capital*, London, England: Swan Sonnenschein, Lowrey, 1887; Joseph Schumpeter, *The Theory of Economic Development*, Cambridge, MA: Harvard University Press, 1934; Schumpeter, *Capitalism, Socialism and Democracy*, New York: Harper and Brothers, 1942, pp. 81–86; Schumpeter, "The Creative Response in Economic History," *Journal of Economic History*, 7, 2, 1947, pp. 149–159.

8 Robert Solow, "A Contribution to the Theory of Economic Growth," *The Quarterly Journal of Economics*, 70, 1, 1956, pp. 65–94.

9 Marx, 1887; Schumpeter, 1947; Solow, 1956.

10 Edward Glaeser, "Are Cities Dying?" *Journal of Economic Perspectives*, 12, 1, 1998, pp. 39–160; Robert Lucas, "On the Mechanics of Economic Development," *Journal of Monetary Economics*, 22, 1988, pp. 3–42.

11 Drucker, 1969, 1993; Machlup, 1962.

12 Romer, 1986.

13 See, Jacob Mincer, *Schooling, Experience and Earnings*, New York: Columbia University Press for the National Bureau of Economic Research, 1974. Also see, Barro, "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics*, 106, 2, 1991, pp. 407–443; Robert J. Barro, *Determinants of Economic Growth: A Cross-Country Empirical Study*, Cambridge, MA: The MIT Press, 1997; Edward L. Glaeser, Albert Saiz, "The Rise of the Skilled City," NBER Working Paper No. 10191, 2003; N. Gregory Mankiw, David Romer, David Weil, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, 152, 1992, pp. 407–37.

14 Todd Gabe, "The Value of Creativity," in David Emanuel Andersson, Åke E. Andersson, and Charlotta Mellander, editors, *Handbook of Creative Cities*, Cheltenham, England: Edward Elgar, 2011 pp. 128–145; Richard Florida, "The Creative Class and Economic Development," *Economic Development Quarterly*, 28, 3, 2014, pp. 196–205; Florida, Mellander, and Kevin Stolarick, "Inside the Black Box of Regional Development—Human Capital, the Creative Class and Tolerance," *Journal of Economic Geography*, 8, 5, 2008, pp. 615–49; Gerald Marlet and Clemens van Woerkens, "The Dutch Creative Class

and How It Fosters Urban Employment Growth," *Urban Studies*, 44, 13, 2007, pp. 2605–26; David McGranahan and Timothy Wojan, "Recasting the Creative Class to Examine Growth Processes in Rural and Urban Counties," *Regional Studies*, 41, 2, 2007, pp. 197–216.

15 Ronald Inglehart, *Culture Shifts in Advanced Industrial Society*, Princeton University Press, 1989; Inglehart, *Modernization and Post-Modernization*, Princeton University Press, 1997; Scott E. Page, *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*, Princeton University Press, 2007.

16 Florida, Mellander, and Stolarick, *Creativity and Prosperity: The Global Creativity Index*, Toronto: Martin Prosperity Institute, 2011.

17 See, for example Zvi Griliches, *Patent Statistics as Economic Indicators: A Survey*, NBER, 1990; Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson, and Sidney G. Winter, "Appropriating the Returns from Industrial Research and Development," *Brookings Papers on Economic Activity*, 3, 1987, pp. 783–831; Richard R. Nelson, *National Innovation Systems: A Comparative Analysis*, Oxford University Press, 1993; Wesley M. Cohen, Richard R. Nelson, and John P. Walsh, "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)," NBER Working Paper No. 7552, February, 2000, http://www.nber.org/papers/w7552.

18 See, Florida, 2014; Marcus Noland, "Popular Attitudes, Globalization and Risk," *International Finance*, 8, 2, 2005, pp. 199–229; Also see, Quamrul Ashraf and Oded Galor, "Cultural Diversity, Geographical Isolation, and the Origin of the Wealth of Nations," NBER Working Paper No. 17640, 2011, http://www.nber.org/papers/w17640.

19 The expansion of the index from 82 countries in the 2011 edition of the report to 139 nations in the 2014 edition could affect the results since the updated version includes more low-income countries than the earlier version.

20 World Economic Forum, *2014–2015 Global Competitiveness Report*, http://www.weforum.org/reports/global-competitiveness-report-2014-2015

21 Schumpeter, 1947.

22 *Global Entrepreneurship Index, 2015*, http://www.weforum.org/reports/global-competitiveness-report-2014-2015

23 See for example, Edward Diener and Martin E. P. Seligman, "Beyond Money: Toward and Economy of Well-Being," *Psychological Science in the Public Interest*, 5, 1, 2004, pp. 1–31.

24 United Nations, *Human Development Report 2014*, United Nations, 2014, http://hdr.undp.org/en/content/human-development-report-2014

25 United Nations, *World Urbanization Prospects: 2014*, United Nations, 2014, http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf.

26 Richard Florida, Tim Gulden, and Charlotta Mellander, "The Rise of the Mega-Region," *Cambridge Journal of Regions, Economy and Society*, 1, 3, 2008, pp. 459–76.

27 World Bank, World Development Indicators Online (WDI) database, 2010–2012, http://data.worldbank.org/indicator/SP.URB.TOTL

28 Organisation for Economic Co-operation and Development, *Focus on Inequality and Growth*, 2014, http://www.oecd.org/els/soc/Focus-Inequality-and-Growth-2014.pdf.

29 See, for examples, David Card, and John E. DiNardo. "Skill-Based Technological Change And Rising Wage Inequality: Some Problems And Puzzles," *Journal of Labor Economics*, 2002, v20 (4, Oct), pp.733–783; Eli Berman, John Bound, and Stephen Machin, "Implications Of Skill-Biased Technological Change: International Evidence," *The Quarterly Journal of Economics*, 113, 4, November 1998, pp. 1245–1280.

30 World Bank, *World Development Indicators Online (WDI) database*, 2004–2013, http://data.worldbank.org/indicator

31 However, it is worth noting that these countries have also seen rising inequality over time. See, Thomas Piketty, *Capital in the Twenty-First Century*, Cambridge, MA: Belknap Press, 2014. Kasper Viita and Kati Pohjanpalo, "Piketty Warns Scandinavia of Growing Income Inequality Risk," *Bloomberg*, June 13, 2014.

32 See, Jonathan D. Ostry, Andrew G. Berg, and Charalambos G. Tsangarides, *Redistribution, Inequality, and Growth*, International Monetary Fund, 2014, http://www.imf.org/external/pubs/ft/sdn/2014/sdn1402.pdf.

33 World Bank, *2010–2012 World Development Indicators Online (WDI) database*, http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS

34 World Bank, *2010–2012 World Development Indicators Online (WDI) database*, http://data.worldbank.org/indicator/IP.PAT.NRES/countries/1W?display=graph

35 International Labour Organization, 2010–2012, http://laborsta.ilo.org/

36 World Bank, *2010–2012 World Development Indicators Online (WDI) database*, http://data.worldbank.org/indicator/SE.TER.ENRR?display=graph

37 Ibid.

38 World Economic Forum, 2014–2015.

39 *Global Entrepreneurship Index*, 2015.

40 United Nations, 2014.

41 World Bank, 2010–2012.

42 World Bank, 2004–2013.

About the Authors

Richard Florida

Richard is Director of Cities at the Martin Prosperity Institute at the University of Toronto's Rotman School of Management. He is also Global Research Professor at New York University, and the founder of the Creative Class Group. He is a senior editor for *The Atlantic*, where he co-founded and serves as Editor-at-Large for *CityLab*, the world's leading media site devoted to cities and urban affairs.

Charlotta Mellander

Long term collaborator of the MPI and visiting faculty at the Martin Prosperity Institute since 2009. Studies location patterns of creative individuals and firms to determine how they shape regional development. Charlotta has more than 150 invited, external speeches, both nationally and internationally, including the EU and the UN, and companies like IBM.

Karen King

Senior researcher and research project manager of Cities. Karen's quantitative research examines the challenges and divides created by urban prosperity with a particular focus on migration and immigration in the United States and Canada. Karen holds a PhD in Geography from McMaster University and Masters of Economics from the University of Toronto.

The authors thank
Isabel Ritchie for the maps,
Michelle Hopgood for graphics,
& Ian Gormely for his editing.

Martin Prosperity Institute
Rotman School of Management
University of Toronto
105 St. George St., Ste. 9000
Toronto, ON M5S 3E6

w martinprosperity.org
e assistant@martinprosperity.org
t 416.946.7300
f 416.946.7606

ISBN 978-1-928162-02-5