THE ATLANTIC CENTURY II

Benchmarking EU & U.S. Innovation and Competitiveness

July 2011

European-American Business Council

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www.itif.org • mail@itif.org
1101 K Street, NW • Suite 600 • Washington, DC 20005
Phone: (202) 449-1351• Fax: (202) 638-4922

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Robert D. Atkinson and Scott M. Andes
The Information Technology and Innovation Foundation

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About the Authors

Dr. Robert Atkinson is the President of The Information Technology and Innovation Foundation. He is the co-author of the forthcoming Yale University Press book, *The Race for Global Innovation Advantage and Why the U.S. is Falling Behind* and the author of *The Past and Future of America's Economy: Long Waves of Innovation that Power Cycles of Growth* (Edward Elgar, 2005). Dr. Atkinson received his Ph.D. in City and Regional Planning from the University of North Carolina at Chapel Hill in 1989.

Scott Andes is a research analyst at The Information Technology and Innovation Foundation. His research areas include emerging markets, global competition, technology and development, and e-commerce. Mr. Andes received a BSc in Government from the London School of Economics.

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EXECUTIVE SUMMARY

The Great Recession was a shock to the global economy. While some nations were impacted much more than others, all nations felt the effects. And the Great Recession was much more than just an extremely severe cyclical contraction; it was a tremor that exposed the fault lines of economic weakness in many nations, including the United States and many in Europe. As such, these fault lines reflect in part a declining ability of these nations to effectively engage in innovation-based competition in the global economy.

In 2009, at the height of the Great Recession, ITIF published the first edition of *The Atlantic Century*, a report that assessed the global innovative-based competitiveness of thirty-six countries and four regions (the European Union (EU)-15 region, the EU-10 region, the EU-25 region, and the North Atlantic Free Trade Agreement region), both as they stood at approximately 2007 and in terms of their progress between the early 2000s and then. The report relied on sixteen indicators from these broad categories: (1) human capital; (2) innovation capacity; (3) entrepreneurship; (4) IT infrastructure; (5) economic policy; and (6) economic performance.

The results were a surprise to most and a wakeup call to many. The United States did not rank number one as many assumed. In fact, it ranked fourth out of thirty-eight nations or regions.[1] And the EU-15 ranked even lower,16 percent below the United States. But the results regarding the rate of progress were even more disconcerting. The United States ranked last in improvement in international competitiveness and innovation capacity over the last decade and the EU-15 region as a whole ranked just twenty-eighth behind fourteen non-EU-15 nations, including China, Singapore, Japan, Russia, and S. Korea.

Now over two years later, we have an opportunity to revisit this question of who is leading and who is lagging, but with even more recent data and with the addition of several new nations (Argentina, Chile, Indonesia, Malaysia, South Africa and Turkey). And we find that the United States' and EU-15's ranks remain unchanged, fourth and eighteenth respectively. The United States leads Europe in twelve of the sixteen indicators, including knowledge (higher education and number of researchers); innovation (corporate and government R&D; information technology (IT investments, e-government, and broadband); overall business climate; entrepreneurship (new firms and venture capital), and productivity. The EU-15 leads the United States in just four of the indicators: academic publications, a lower effective corporate tax, trade performance, and foreign direct investment (FDI) inflows.

The United States lags behind several European nations, including Finland and Sweden. However, it is important to note when making comparisons between individual EU nations and the United States, that there is also significant regional variation within the United States. If we compare individual U.S. states against individual EU nations, the picture is quite different. In this edition, we compare the U.S. states to the 43 other countries or regions studied here across seven indicators and find that the nine most competitive U.S. states would lead the world if they were countries, while even the least competitive (Mississippi) would still fall towards the middle of the pack. Were Massachusetts its own nation, it would be the most innovative economy on the planet.

But in terms of progress and rate of change the picture is troubling to say the least. Of 44 countries and regions, the United States ranks second to last in terms of progress over the last decade, ahead of only Italy. This is slightly better than in 2009 when the United States ranked dead last. And the EU-15 ranks thirty-sixth in the rate of change behind twenty non-EU-15 nations. However, the story in the last few years is at least a bit more positive for the United States, which ranked twenty-seventh in overall rate of change from 2007 to 2009.

These findings continue to have significant implications for Europe and the United States. Both continue to lose ground in the race for global innovation advantage. We see that the two regions of the globe making the fastest progress are Eastern Europe and Southeast Asia. In terms of the former, the EU-10 still lags behind the United States and the EU-15, with overall scores at just 60 percent of the U.S. score. But five Eastern European nations – Cyprus, Slovenia, Estonia, the Czech Republic, and Latvia – are in the top ten in terms of rate of progress between 1999 and 2011. However, the Great Recession had a disproportionate impact on them, with Latvia actually ranking last in progress in the last several years, and Lithuania thirty-sixth. Southeast Asia, China and S. Korea are the top two nations in the rate of change over the last decade and Singapore ranks eighth.

Some of these findings reflect a simple process of catch up. Countries that are less advanced when it comes to innovation can perhaps advance more easily than countries at the leading edge. But some of the nations that have shown faster progress than the United States or the EU-15 are advanced nations, such as S. Korea, Japan, Australia, and Canada.

So where does that leave the United States and Europe? The simple answer is that unless they change course, the path they are in is a downward one, at least in relative terms. Regaining global innovation-based competitiveness means moving aggressively into next-generation industries, including advanced IT, robotics, nanotechnology, biotechnology, and high-level business services, while at the same time maintaining output in highly efficient and competitive traditional industries, and continually raising productivity in local non-traded sectors such as retail and health care, particularly through the widespread use of information technology.

There are two key steps Europe and the United States must take to increase the chances of this successful outcome. First, they need to join together in a robust free-trade alliance, in part to increase commercial linkages but also to put real pressure on innovation mercantilists, particularly in Asia. Innovation mercantilism hurts both the United States and Europe, and unless they band together to take a much tougher stance against it, both will continue to lose innovation-based competitiveness. As such, the United States and Europe must engage in a strategic partnership to push back against innovation mercantilism. A key step should be the establishment of a Trans-Atlantic Partnership, modeled after the Trans-Pacific Partnership.[2]

While pushing back against innovation mercantilism will be an important step, it will not be enough. Both Europe and the United States also need to ensure that their domestic policies do a much better job of supporting innovation, productivity and competitiveness, through both increased government investment in innovation and lower taxes on corporate investment in innovation.

But each region has special challenges. For Europe, it's to fully embrace innovation. As much as European leaders proclaim their support of innovation, many have a decidedly schizophrenic view of it. They want the benefits of a knowledge-based technology economy without the creative

destruction that not only accompanies it but is required to achieve it. Unless Europe can accept that innovation entails plant closures and job losses, new technologies with uncertain social or environmental impacts, and new kinds of business models and organizations that may challenge traditional assumptions about matters like privacy, it's unlikely that it will be able to keep up in the race for global innovation advantage.

America's challenge is different. Its major challenge is not timidity, but torpidity. For too many in America believe that the United States has been number one for so long that it will continue to be number one regardless of whether it acts decisively. Given this situation, the thinking goes, there is no real need for the United States to develop and implement a national innovation-based competitiveness strategy. Moreover, to the extent that there is any strategy in the United States it should be to ensure that market forces are allowed to work (e.g., support free trade, restrict market power, simplify the tax code and deregulate market entry) rather than enact a proactive innovation competitiveness strategy. This ties into to America's other big challenge, overthrowing the stale straightjacket of neoclassical economics that holds that countries don't compete, that innovation is manna from heaven, and that government action to spur innovation only makes things worse. Instead, it needs to embrace a new "innovation economics" that puts advancing innovation at the forefront of economic policy.[3]

So the question of whether the twenty-first century will remain the Atlantic century is one that remains to be seen. But we can be sure of one thing: it will not be the Atlantic century if Europe and America continue on the policy path they are on. If they can form an anti-mercantilism alliance, while addressing the unique challenges to domestic innovation policy each face, then we will see. Who knows, maybe this will be the Atlantic century after all.

Overall Scores

Country	Overall Score	Rank	Country	Change Score 1999-2011	Change Rank 1999-2011	Country	Change Score 2009-2011	Change Rank 2009-2011
Singapore	74.2	1	China	21.5	1	Portugal	18.1	1
Finland	68.0	2	S. Korea	18.7	2	Slovenia	16.7	2
Sweden	67.1	3	Cyprus	18.5	3	Indonesia	16.3	3
U.S.	**65.2**	**4**	Slovenia	17.3	4	Slovakia	15.3	4
S. Korea	62.6	5	Estonia	16.4	5	China	14.4	5
UK	61.7	6	Czech Rep.	15.5	6	Greece	13.7	6
Canada	61.1	7	Latvia	14.2	7	S. Korea	13.7	7
Denmark	60.5	8	Singapore	13.9	8	**EU-10**	**13.5**	**8**
NAFTA*	59.9	9	**EU-10**	**13.5**	**9**	Australia	12.0	9
Netherlands	59.6	10	Portugal	13.4	10	Poland	12.0	10
Japan	57.6	11	Hungary	13.3	11	Czech Rep.	11.9	11
Australia	57.0	12	Lithuania	12.6	12	Hungary	11.7	12
Belgium	55.4	13	India	12.2	13	Malaysia	11.6	13
France	54.4	14	Austria	11.7	14	Chile	11.3	14
Ireland	54.4	15	Chile	10.7	15	Mexico	10.9	15
Germany	53.8	16	Greece	10.5	16	Cyprus	10.8	16
Austria	53.3	17	Japan	10.5	17	Argentina	10.8	17
EU-15**	**53.0**	**18**	Slovakia	9.7	18	Turkey	10.7	18
EU-25**	**50.9**	**19**	Finland	9.4	19	Finland	10.6	19
Czech Rep.	49.5	20	Denmark	9.3	20	India	10.6	20
Estonia	48.3	21	Australia	9.2	21	Austria	10.3	21
Hungary	47.3	22	Indonesia	8.9	22	Estonia	9.8	22

Country	Overall Score	Rank	Country	Change Score 1999-2011	Change Rank 1999-2011	Country	Change Score 2009-2011	Change Rank 2009-2011
Spain	45.7	23	Ireland	8.8	23	Brazil	9.7	23
Slovenia	44.2	24	UK	8.1	24	UK	9.1	24
Portugal	41.3	25	Brazil	8.0	25	Spain	8.9	25
Slovakia	41.0	26	Mexico	8.0	26	Netherlands	8.7	26
EU-10**	**39.3**	**27**	Poland	7.8	27	**U.S.**	**8.4**	**27**
Latvia	37.9	28	**EU-25**	**7.7**	**28**	South Africa	8.0	28
Russia	36.8	29	Netherlands	7.4	29	Japan	7.9	29
Italy	36.3	30	Turkey	7.2	30	Russia	7.8	30
Malaysia	36.1	31	Spain	7.1	31	**EU-25**	**7.6**	**31**
Lithuania	36.0	32	Argentina	6.9	32	Germany	7.6	32
Chile	35.0	33	Russia	6.7	33	NAFTA	7.3	33
China	34.0	34	Canada	6.6	34	Canada	6.8	34
Cyprus	33.4	35	Malaysia	6.6	35	**EU-15**	**6.6**	**35**
Poland	31.9	36	**EU-15**	**6.5**	**36**	Lithuania	6.3	36
Greece	31.7	37	France	6.1	37	Denmark	6.3	37
Brazil	29.3	38	Germany	5.9	38	Belgium	6.2	38
Turkey	28.0	39	Sweden	5.4	39	France	5.9	39
Mexico	27.0	40	Belgium	5.2	40	Sweden	5.8	40
South Africa	26.8	41	NAFTA	4.8	41	Ireland	5.7	41
Argentina	25.4	42	South Africa	4.6	42	Singapore	5.5	42
India	18.6	43	**U.S.**	**4.1**	**43**	Italy	5.2	43
Indonesia	15.5	44	Italy	2.6	44	Latvia	1.0	44
Average	**45.6**		**Average**	**9.8**		**Average**	**9.8**	

*** North American Free Trade Agreement region, which encompasses Mexico, Canada, and the United States.**

**** The European Union is a supranational organization that consists of 27 countries across the European continent. The EU-15 consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. The EU-10 consists of the 10 new member states that joined the EU in 2004: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. The EU-25 consists of all member states however Bulgaria, Romania, Malta and Luxembourg were not included because of a lack of sufficient data for analysis.**

Methodology

The methodology of the *2011 Atlantic Century* builds on that of the 2009 version of the report. To better capture the global economy, six new countries have been added to the analysis: Argentina, Chile, Indonesia, Malaysia, South Africa and Turkey. These countries represent both a diverse set of geographic regions and stages in the development of an innovation economy. Also, several indicators have been improved upon to better capture the components of innovation-based global competitiveness. The indicators with new methodologies are academic publications, new firms, e-government, effective corporate tax rate, and real GDP per worker. A detailed explanation of the new methodologies can be found in the endnotes. Because of changes to the methodology the overall scores for the *2009 Atlantic Century* have also been updated. For example, while the United States ranked sixth in the 2009 report it ranks fourth after updating the 2009 scores to reflect the *2011 Atlantic Century* methodology, the same as it ranks this year. In other words, the United States' score has remained unchanged. One other change that impacted the U.S. rank is the deletion of Luxembourg from the countries studied (due to data difficulties), which previously ranked third, above the United States.

To create a holistic understanding of how a country is performing in terms of global competitiveness and whether or not that performance is expected to continue, decline, or increase in the future, ITIF used the following sixteen indicators to evaluate the global competitiveness of the United States and other countries:

Human capital: higher education attainment in the population ages twenty-five to thirty-four years; and number of science and technology researchers per 1,000 employed.

Innovation capacity: business investment in research and development (R&D); government investment in R&D; and the number and quality of academic publications.

Entrepreneurship: venture capital investment; and new firms.

Information technology (IT) infrastructure: e-government; broadband telecommunications; and corporate investment in IT.

Economic policy: effective marginal corporate tax rates; and the ease of doing business.

Economic performance: trade balance; foreign direct investment inflows; real GDP per working-age adult; and GDP per hour worked (productivity).

To be sure, additional indicators would provide an even stronger assessment of national differences. But lack of comparable hard data is a significant barrier to fully understanding the differences between nations. Moreover, most other reports that measure global innovation-based competitiveness depend on opinion surveys for their rankings, whereas *The Atlantic Century* only relies on hard data. Opinion surveys can suffer from significant biases among respondents, scoring nations on the basis of their reputation, rather than reality.

To calculate an overall score for each country the report calculated scores for each indicator and each nation on the basis of their standard deviation from the mean for each variable.[4] Each indicator was weighted by what we estimated to be its relative importance (see Appendix). Collectively the weights equal 100. The standard deviation was multiplied by the weight and the adjusted standard deviations were added together to generate the overall indicator score for each country. Each country's total score was then divided by the best score possible. Thus, each country's final score is a percentage of the total score a nation would have achieved if it had finished first in every category.[5] To rank change between the base year (the base year is generally 1999 or 2000) and current year (the latest year for which data are available) ITIF calculated both absolute and percentage change for each indicator, added each for all indicators and calculated the mean score of the two numbers and found the corresponding standard deviation.[6] Percentage change scores tend to favor countries with lower scores in the base years since rapid progress from a low base yields a high percentage change.

The 2011 Atlantic Century also ranks change between data from the 2009 version of the report (data generally from 2005 or 2006) and data from the latest year available (generally 2008 or 2009). For indicators with a different methodology than 2009 we have updated the base and mid-year to reflect the most current methodology.

Europe vs. the United States

The United States continues to lead Europe. The overall score of the EU-15 is just 80 percent of the U.S. score. And the EU-10 score is even lower at just 60 percent of the U.S. level, as might be expected, given EU-10 countries' recent emergence as market economies.

The United States leads Europe in twelve of the sixteen indicators, including knowledge (higher education and number of researchers); innovation (business and government R&D); information technology (IT investments, e-government, and broadband); overall business climate; entrepreneurship (new firms and venture capital), and productivity. The EU-15 outperforms the United States in four indicators: academic publications, a lower effective corporate tax, trade performance, and foreign direct investment (FDI) inflows.

These overall scores mask significant differences within Europe. Finland and Sweden rank second and third of all nations examined and score 3 and 4 percent higher respectively than the United States. But all other EU-15 nations score below the United States, with Italy scoring just 56 percent of U.S. levels and Greece less than 50 percent. In fact, Greece scores below several developing nations, reflecting the wide variation between the lowest ranking and highest ranking European nations. This low score may in fact be a key cause of Greece's current economic and financial difficulties. Within the EU-10 there is considerable variation as well, with Poland scoring at 49 percent of U.S. levels, but the Czech Republic and Estonia scoring above Spain, at 76 percent of U.S. levels.

It is important to note when making comparisons between individual EU nations and the United States, that there is also significant regional variation within the United States. In ITIF's *2010 State New Economy Index*[7] for example, Massachusetts, the highest ranking state, had more than eight times the amount of business R&D as a share of its economy than Mississippi, the lowest ranking state. In "Box 1: What If U.S. States Were Countries?" we compare the fifty states to the 44 countries studied here across the seven indicators where there was comparable data and find that the nine most innovative U.S. states would lead the world if they

were their own countries, while others would fall towards the middle of the pack. In fact, if the lowest ranking state, Mississippi, were a nation, it would rank eighteenth out of forty-four nations and regions.

Although the United States ranks higher than Europe, the trends are moving in the opposite direction. Of all the countries and regions studied, the United States ranks second to last in rate of progress since 2000, ahead of only Italy. Indeed, in 2000 (the base year used for comparison) the United States led these nations across the sixteen indicators, by a large margin. The lack of relative progress over the last decade is why the United States fell from a solid number one in 2000 to fourth place today. Since approximately the beginning of this decade the EU-15 has made slightly faster progress than the United States as a whole (although the EU-15's change score is still below average of all nations/regions examined). Among EU-15 nations, Austria, Greece, Finland and Denmark made the fastest progress.

The EU's catching up is perhaps not surprising given the efforts made by both the European Commission and individual EU-15 nations to become more knowledge-and innovation-based. European nations have made concerted efforts to lower corporate tax rates in order to be more globally competitive. And they have not just lowered rates they have boosted incentives for innovation. For example, in recent years, France put in place the most generous R&D tax credit in the world, six times more generous than that of the United States. Beginning in 2007 eight European nations have put in place "patent box" tax regimes which tax incomes from patents (and in some nations other intellectual property) at much lower rates than their regular corporate tax rates. Moreover, as part of the Lisbon Agenda, Europe has expanded government support for R&D. In fact, from 1999 to 2009, European government R&D (from nations and the European Commission) is up 5 percent as a share of GDP, compared to a decline of 1 percent in the United States.

In contrast, as described below, U.S. policymakers have done less, in part because many believe either that the United States is not fundamentally in competition with other nations, or that it holds an insurmountable lead and will continue to do so.[8] For example, although the United States was the first nation to realize the importance of spurring R&D through the tax code, since then other countries have adopted more competitive R&D tax credits, and for this reason the U.S.'s credit currently ranks seventeenth in generosity amongst OECD countries.[9]

In part because the EU-10 are starting from a lower base, but also because of some of the policy steps these nations have taken, they have made even faster progress than the EU-15. The Baltic states in particular have shown rapid progress. These indicators of regional progress, however, mask individual country trends. Italy, having found it difficult to embrace the kind of reforms needed to more rapidly progress, scores last in progress, (one place behind the United States). In contrast, many EU-15 nations, including, Austria, Denmark, and Finland have made relatively rapid progress.

In the last several years, however, the United States has actually made faster progress than the EU-15. From 2006 to approximately 2009 (depending on the indicator, the most recent data are from 2008 to 2010) the United States progressed 24 percent faster than the EU-15. Several indicators have impacted the U.S.'s progress over the last several years. Growth in corporate investment in R&D and IT equipment was higher in the United States. In fact, U.S. corporate R&D as a percent of GDP reached its highest level since 1953 (the first year data was collected) short of 2000, in part because the economic downturn reduced U.S. GDP, the denominator, but also in part because U.S. firms actually increased R&D funding despite the recession. Another indicator where the United States grew faster than Europe was in e-government. The Obama administration's emphasis on e-government clearly helped the U.S. rank. And the U.S. gained vis-à-vis the EU-15 because we gained on the trade deficit (as the U.S. deficit fell, in part because Americans were buying less in the recession) and because our productivity grew faster than the EU-15's. Again, there is a wide discrepancy amongst all European countries with Portugal and Slovenia making the most progress of all nations, while Italy and Latvia made the least progress.

In presenting the results of the 2009 *Atlantic Century* report at various conferences and meetings, the finding that the United States ranked dead last in progress on innovation-based competitiveness was an unpleasant surprise to most audiences. However, in response to this, there were three arguments generally made to the effect that this finding was erroneous. The first was that while the United States may have been last in progress, it is still the most innovative nation in the world in terms of number of scientists, amount of R&D investment, and the like. This is completely true, and largely meaningless. By this measure it's better to live in China than Japan because China recently overtook Japan in GDP. Of course, this ignores the fact that China has ten times as many people as Japan. In other words, it is inappropriate to measure the innovative basis of nations on the basis of totals; one has to use per-capita or per-GDP measures. It's a bit like saying that the United States is ten times less healthy than Canada because we have an overall level of mortality ten times higher.

The second argument against the findings was equally spurious: it was not appropriate to combine multiple indicators into one overarching indicator. But in fact, most reports ranking nations do just this. As we discussed in the methodology, using standard deviations and weights, it is appropriate to combine multiple indicators to come up with one overarching metric of performance.

The third critique was that it was not fair to compare the rate of progress of a leading nation like the United States to less advanced nations that are naturally catching up. We address this below, but for now it's worth pointing out that a number of advanced nations, including Japan, Finland, Austria and others, made much faster progress than the United States.

Europe and the United States vs. the Rest of the World

In 2009 Singapore was the leader among the nations examined, and it remains at the top. Singapore ranks number one with a score 14 percent higher than the United States and 40 percent higher than the EU-15. As John Kao documented in *Innovation Nation,*[10] Singapore has made technological innovation almost a national obsession, putting in place a robust set of policies to lead the knowledge economy. Despite a much lower per-capita income and being earlier on the development ladder, South Korea, ranking fifth, scores only 4 percent lower than the United States, and 17 percent higher than the EU-15. Like Singapore, it also has made technological innovation and economic competitiveness a national priority. For example, with favorable corporate tax policies and agencies like the

Korea Information Agency and the Industrial Technology Foundation, South Korea has made a concerted effort to prosper through technology-led growth. Even Japan, which many economic pundits have mistakenly written off as a 1980s and 1990s has-been (in large part because of slow GDP growth, which stems not so much from poor economic performance but from a declining working age population) scores at 83 percent of U.S. levels and 7 percent ahead of the EU-15.

Many nations that get much of the attention as competitors in the innovation economy—including fast-developing Brazil, Russia, India, and China, often called the BRICs—actually score at the bottom of the rankings. This does not mean that these and other low-ranking nations do not have some innovation strengths—they do—but as a share of their overall economies, these strengths are still quite minimal. Indeed, at least one smaller developing country, Malaysia, ranks higher than Brazil, India and China. While petroleum still drives Malaysia's economy, the growth of the electronics sector has helped move Malaysia into a middle income economy. Chile as well has moved from a resource-driven economy to one focused on open markets and innovation, in part due to bold moves by the government such as the creation of an Innovation Council for Competitiveness and a National Innovation Strategy.[11] Other less than fully developed markets such as Indonesia, Argentina, South Africa and Turkey rank quite low. South Africa has been lauded as an up-and-coming global competitor because of its rapid GDP growth. However the majority of this growth has come from high commodity prices not the development of an innovation economy. Argentina ranks low in part because of an array of anti-innovation policies the government has put in place in response to political pressures[12] The main attraction of many of these nations remains their low costs, not their innovative infrastructures, and this situation will likely remain for many years, at least until they raise productivity in a wide range of sectors. These countries should invest in the building blocks of innovation: infrastructure, education, and new capital equipment, including IT, for all their industries, not just export ones, and at the same time improve their domestic business climates and spur more economic competition.

In terms of progress, however, the picture is quite different. As noted above, the United States ranks second to last in progress over the last decade. In other words, every other nation/region, except Italy, made faster progress in the last decade, and many made faster progress than the EU-15. East Asian nations, in particular, (and as discussed above EU-10 nations) are making rapid strides. China comes in first in terms of progress, as it did in the 2009 rankings. China has aggressively promoted modernization and technology development and its progress reflects this. Similarly, South Korea, which has created more innovative policies than perhaps any other country in the world, ranks second in rate of progress. While advancing more slowly than China and South Korea, Singapore, India and Japan all score within the top twenty countries and have made significantly faster progress than both the United States and the EU-15. Overall East Asia's central challenge will be to transition in the next decade away from an export-led model of growth, much of it based on mercantilist policies like currency manipulation, to policies that spur innovation, IT use, and productivity growth through all sectors of their economy—not just a few select export industries.[13]

Overall, these trends suggest that absent concerted public sector efforts by the United States and Europe to boost innovation and competitiveness, this century will not be the Atlantic century, but rather the Pacific century, or perhaps more accurately the Southeastern Asian century.

Surprisingly, several developing countries have made relatively little progress, despite starting from low bases. South Africa is third to last, ahead of only Italy and the United States. Malaysia made less progress than Canada and the Netherlands, perhaps because it finds itself squeezed between innovation powerhouses like Singapore and Korea on the one hand and low-cost production sites like China and India on the other. Turkey's slow progress is surprising given the country's efforts to modernize within the last decade.

Latin America has also made much less progress than Southeast Asia. Of the four South American countries studied, only Chile scores above average (although all exceed the United States). This reflects the challenges that Latin American nations in general face. Stuck between the rich and knowledge-intensive economies of Europe, Japan and the United States and the rapidly modernizing Asian nations, including low-wage nations like India and China, most Latin America countries have not been able to develop and execute the policies that would enable them to get on the high-growth, innovation-based path. Their strength remains in low costs, but if they can effectively address their weaknesses, particularly in business climate (including government policies that limit competition), workforce skills, and infrastructure, and focus on boosting productivity in a wide range of sectors (rather than a few favored export sectors) they could be positioned for more rapid progress.

Compared to the entire last decade, the picture in the last few years is quite different, in part due to differences in how nations weathered the Great Recession. There is a fair (0.44) correlation between change from 1999 to 2011 and change from 2009 and 2011, suggesting that, on the one hand nations' trends continued, but on the other that there were other factors determining rate of progress.[14] For example, the rapid increase in FDI in Indonesia since the mid 2000s has helped Indonesia progress twice as fast as the United States and the EU-15. Likewise, Malaysia was near the bottom in progress in the overall decade, but has progressed quite rapidly since 2006, in part because of its resilience to the economic recession. Malaysian banks learned valuable lessons from the Asian financial crisis and are well capitalized, conservatively regulated and had virtually no exposure to the U.S. subprime market. Since 2006 Malaysia has also become a major exporter of solar panels and other high tech products.[15]

In contrast, nations like Latvia, Lithuania and Singapore slowed significantly in their relative rates of progress. In the case of Singapore, rapid progress before 2006 in areas like growth of educated workforce and researchers may have made it was hard to keep up the pace. But part of the Singapore stall may be related to the natural limits of its development model. The limits of export-led growth strategies were certainly exposed in the Great Recession. Singapore's trade surplus, one of the highest in the world as a share of GDP, fell and productivity stagnated. For Latvia and Lithuania, a recent stagnation of productivity, compared to the earlier period, played a key role in their slowdown.

Change in Rank in Rate of Progress for Selected Nations from 1999 to 2011 and 2009 to 2011.

25	Malaysia
21	Indonesia
17	Poland
16	Argentina
15	**U.S.**
13	Mexico
13	South Africa
12	Australia
12	Slovakia
11	Turkey
10	Portugal
-10	Cyprus
-13	Japan
-17	Estonia
-17	Ireland
-18	Denmark
-23	Lithuania
-34	Singapore
-35	Latvia

Some might attribute these trends, and in particular the United States' poor rate of progress, to a process of convergence, where laggards naturally catch up to leaders. To be sure, there is more likely to be convergence with respect to some factors than others. On indicators where the potential to increase is limited (e.g., the percentage of the college-aged population with a college degree is limited at 100 percent) convergence is more likely. But on many other indicators where the potential is unlimited (e.g. GDP per adult) or where the levels are relatively low (e.g. venture capital), there is no reason to expect convergence. Therefore, while there might be convergence on some factors between high-income nations and lower income nations, on many factors, high-income nations like the United States should be able to continue to make progress at least the rate of lower income nations. Indeed growth economists have noted that convergence between high-wage and low-wage nations has generally not occurred.[16] Moreover, if convergence really is at work, why have highly developed nations like Australia, Austria, Denmark, Finland, Japan and Sweden made much faster progress than the United States? And why have several developing countries made little progress? In reality the evidence suggests that regardless of a nation's current placement, depending on economic and policy choices, all countries have the potential to gain or lose ground. Also, because change scores are an average of percentage change and *percentage point change*, more developed countries can have an advantage because it is easier for them to make larger absolute changes. An example is broadband penetration. Turkey grew by the largest percent (from .03 percent to 8.5 percent) because its base was very small in absolute terms. Yet its growth was still much less than the Netherlands' (from 7 percent to over 35 percent).

Indeed, the progress of these and a number of nations is truly striking, reflecting an eagerness and drive to take the steps needed to move ahead. Like a well-known U.S. car rental company which held second place in market share to the leader and whose slogan in the 1970s was "We're number 2, we try harder," most if not all of these nations don't see themselves as leaders and therefore they do try harder. In contrast, like an aging sports dynasty that has won the Super Bowl for many years but blithely ignores the rising performance of younger teams, many in the United States still persist in believing that the United States is number one and that it is its destiny to remain so almost regardless of what it does. But both the fact the United States is no longer number one and is progressing more slowly than forty-three of the forty-four nations examined here suggests that riding on past laurels is a path to decline for the United States, or for that matter any nation. It is worth reiterating that in 2000 the United States ranked first, a position it likely held for the majority of the post-war period, but in a decade it has fallen to fourth. At this rate, where will the United States rank at the end of the next decade? The answer is that if the U.S. continues to progress at the same rate it did in the last decade relative to other nations, it will likely fall to tenth place by 2020.

Overall 2011 Score

	Overall		Education		Researchers		Publications		Business R&D		Govt. R&D		Venture Capital		New Firms	
Country	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Singapore	74.2	1	38.0%	17	12.1	2	7.0	9	1.4%	9	0.8%	3	0.24%	1	7.40	4
Finland	68.0	2	38.3%	16	16.9	1	7.6	4	2.3%	2	0.8%	2	0.24%	2	3.37	17
Sweden	67.1	3	38.5%	14	10.9	5	8.5	2	2.2%	4	0.8%	6	0.21%	3	4.09	14
U.S.	**65.2**	**4**	**41.6%**	**10**	**9.7**	**6**	**6.2**	**14**	**1.9%**	**5**	**0.8%**	**8**	**0.12%**	**11**	**4.30**	**11**
S. Korea	62.6	5	57.9%	1	9.7	7	4.2	28	2.3%	3	0.8%	7	0.07%	20	1.72	31
UK	61.7	6	38.4%	15	9.2	8	7.2	6	0.9%	18	0.6%	19	0.20%	4	8.05	2
Canada	61.1	7	55.9%	2	8.6	13	7.1	8	0.9%	19	0.6%	15	0.08%	19	7.56	3
Denmark	60.5	8	43.1%	6	11.5	4	8.9	1	1.7%	7	0.7%	10	0.16%	5	4.57	10
NAFTA	59.9	9	37.4%	18	7.5	16	5.5	19	1.4%	8	0.7%	9	0.11%	14	4.67	8
Netherlands	59.6	10	39.8%	13	6.3	23	8.5	3	0.9%	20	0.6%	18	0.10%	16	3.10	20
Japan	57.6	12	55.1%	4	11.8	3	4.3	26	2.7%	1	0.6%	20	0.07%	21	1.28	32
Australia	57.0	11	41.7%	9	8.8	12	7.2	7	1.1%	12	0.8%	4	0.13%	6	6.38	5
Belgium	55.4	13	42.3%	7	8.9	11	7.5	5	1.1%	11	0.4%	31	0.10%	17	4.28	12
France	54.4	14	40.7%	12	8.9	10	5.8	16	1.0%	16	0.8%	5	0.13%	8	3.08	21
Ireland	54.4	15	45.1%	5	6.7	20	6.8	10	0.7%	22	0.4%	28	0.13%	7	4.67	7
Germany	53.8	16	23.9%	28	8.1	14	6.3	13	1.7%	6	0.7%	11	0.09%	18	1.19	33
Austria	53.3	17	19.4%	33	8.9	9	6.8	11	1.2%	10	1.0%	1	0.03%	27	0.58	38
EU-15	**53.0**	**18**	**32.4%**	**21**	**7.8**	**15**	**6.3**	**12**	**1.0%**	**15**	**0.6%**	**14**	**0.13%**	**10**	**3.32**	**18**
EU-25	**50.9**	**19**	**31.8%**	**23**	**7.3**	**18**	**6.0**	**15**	**1.0%**	**17**	**0.6%**	**17**	**0.12%**	**13**	**3.25**	**19**
Czech Rep.	49.5	20	16.0%	36	6.2	24	4.6	24	0.8%	21	0.6%	16	0.12%	12	3.00	22
Estonia	48.3	21	35.8%	20	6.4	22	5.5	18	0.4%	26	0.7%	13	N/A	N/A	8.10	1
Hungary	47.3	22	24.0%	27	4.5	30	4.5	25	0.4%	29	0.4%	30	0.05%	23	6.26	6
Spain	45.7	23	40.8%	11	7.1	19	5.4	20	0.6%	24	0.5%	21	0.13%	9	2.92	23
Slovenia	44.2	24	30.0%	24	7.5	17	5.3	21	1.0%	14	0.5%	23	N/A	N/A	4.16	13
Portugal	41.3	25	23.2%	29	5.6	26	5.0	23	0.6%	23	0.5%	22	0.03%	26	3.92	16
Slovakia	41.0	26	18.4%	35	5.3	27	3.4	34	0.2%	41	0.3%	43	N/A	N/A	4.04	15
EU-10	**39.3**	**27**	**28.6%**	**25**	**4.7**	**28**	**3.9**	**29**	**0.4%**	**30**	**0.4%**	**29**	**0.05%**	**22**	**2.58**	**25**
Latvia	37.9	28	37.3%	19	4.1	32	2.7	39	0.2%	40	0.3%	39	N/A	N/A	4.62	9
Russia	36.8	29	55.5%	3	6.6	21	2.1	44	0.3%	34	0.7%	12	0.00%	33	2.61	24
Italy	36.3	30	19.9%	31	4.3	31	5.6	17	0.5%	25	0.5%	24	0.04%	24	1.78	30
Malaysia	36.1	31	19.0%	34	0.9	41	2.4	42	0.4%	28	0.0%	33	N/A	N/A	2.55	26
Lithuania	36.0	32	41.7%	8	6.0	25	3.4	35	0.2%	38	0.4%	27	N/A	N/A	2.18	28
Chile	35.0	33	6.2%	43	2.2	36	3.5	31	0.3%	33	0.3%	36	0.00%	32	2.12	29
China	34.0	34	12.2%	38	1.9	38	2.3	43	1.1%	13	0.3%	38	0.00%	31	N/A	N/A
Cyprus	33.4	35	22.9%	30	2.2	37	4.3	27	0.1%	43	0.3%	42	N/A	N/A	N/A	N/A
Poland	31.9	36	32.1%	22	4.0	33	3.5	33	0.2%	36	0.4%	34	0.02%	28	0.52	39
Greece	31.7	37	28.2%	26	4.5	29	5.1	22	0.2%	37	0.3%	40	0.01%	29	1.18	34
Brazil	29.3	38	11.0%	40	1.5	39	2.7	40	0.4%	27	0.5%	25	0.11%	15	2.38	27
Turkey	28.0	39	15.5%	37	2.2	35	2.8	38	0.3%	32	0.3%	35	N/A	N/A	0.87	35
Mexico	27.0	40	19.7%	32	0.9	42	2.9	37	0.2%	39	0.3%	37	0.04%	25	0.61	37
South Africa	26.8	41	N/A	N/A	1.4	40	3.8	30	0.3%	31	0.4%	32	N/A	N/A	0.77	36
Argentina	25.4	42	8.0%	42	2.4	34	3.5	32	0.1%	42	0.3%	41	N/A	N/A	0.46	40
India	18.6	43	8.1%	41	0.4	43	2.4	41	0.2%	35	0.5%	26	0.01%	30	0.12	42
Indonesia	15.5	44	11.4%	39	N/A	N/A	3.2	36	N/A	N/A	0.0%	44	N/A	N/A	0.18	41
Average	**45.6**		**30.6%**		**6.3**		**5.0**		**0.9%**		**0.5%**		**0.09%**		**3.20**	

E-Government		IT Investments		Broadband Composition		Effective Corporate Tax		Business Climate		FDI		Trade Balance		GDP Per Adult		Productivity	
Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
0.686	8	6.74%	12	5.2	18	16%	5	13.6	1	7.4%	5	17.9%	2	74,602	2	N/A	N/A
0.479	26	6.74%	11	6.9	6	24%	23	7.7	8	0.0%	44	3.2%	14	55,494	16	44.69	14
0.527	21	5.91%	16	7.5	3	22%	17	5.9	12	5.4%	8	6.9%	6	60,898	8	46.79	10
0.937	**2**	**7.19%**	**5**	**5.9**	**11**	**28%**	**35**	**9.4**	**4**	**1.6%**	**34**	**-3.8%**	**37**	**76,865**	**1**	**55.16**	**3**
1.000	1	7.70%	3	10.6	1	24%	24	5.6	13	0.3%	43	1.4%	17	42,382	24	25.33	27
0.775	5	7.08%	7	5.7	15	24%	21	11.3	2	2.3%	18	-2.5%	33	57,843	12	45.62	12
0.883	3	6.89%	9	5.7	14	22%	15	9.2	5	2.6%	14	-0.1%	24	60,238	9	43.91	16
0.673	12	4.84%	32	7.2	5	25%	26	6.1	11	0.9%	41	3.5%	13	59,639	10	45.35	13
0.814	4	7.16%	6	5.2	19	25%	27	8.4	7	1.7%	32	-3.4%	36	70,853	3	51.03	7
0.680	10	6.16%	15	7.5	4	19%	10	5.3	14	2.4%	16	7.7%	4	65,174	4	56.94	1
0.673	11	6.41%	13	8.1	2	39%	39	6.3	10	0.4%	42	0.2%	22	54,795	17	38.37	20
0.765	7	4.71%	34	4.9	24	27%	33	10.3	3	3.5%	11	-1.8%	28	64,152	5	44.66	15
0.625	14	5.20%	25	6.1	10	20%	12	2.5	21	6.4%	7	1.8%	16	59,312	11	55.93	2
0.683	9	5.07%	29	6.4	9	23%	20	1.1	24	2.3%	20	-2.1%	32	57,157	13	53.22	5
0.498	24	5.13%	28	4.7	26	22%	18	8.4	6	7.0%	6	7.0%	5	63,583	6	54.99	4
0.549	20	5.53%	20	6.5	8	28%	36	4.8	15	1.0%	40	5.7%	9	57,034	14	52.60	6
0.476	27	5.48%	22	5.0	23	20%	13	2.8	19	1.9%	29	5.2%	10	62,708	7	50.00	8
0.593	**16**	**5.54%**	**19**	**5.8**	**13**	**25%**	**29**	**2.7**	**20**	**2.0%**	**28**	**0.7%**	**19**	**55,688**	**15**	**48.20**	**9**
0.567	**19**	**5.66%**	**18**	**5.6**	**16**	**24%**	**25**	**2.1**	**22**	**2.2%**	**22**	**0.5%**	**21**	**54,043**	**18**	**46.01**	**11**
0.454	28	8.29%	1	4.5	28	N/A	N/A	-1.9	31	2.2%	21	5.1%	11	37,567	25	26.24	25
0.502	23	N/A	N/A	5.3	17	N/A	N/A	1.9	23	8.3%	4	0.6%	20	29,637	28	21.12	31
0.505	22	6.97%	8	5.1	22	14%	2	0.8	26	18.2%	1	1.2%	18	29,631	29	25.46	26
0.765	6	4.79%	33	4.8	25	22%	16	-0.9	28	2.5%	15	-4.0%	38	47,359	21	41.88	18
0.400	33	4.92%	30	5.1	20	17%	6	-5.6	37	1.2%	37	-0.8%	26	42,718	22	30.55	22
0.387	34	6.21%	14	5.1	21	19%	9	4.6	16	1.5%	35	-8.9%	41	N/A	N/A	27.02	24
0.346	39	7.88%	2	4.5	27	14%	3	0.9	25	1.6%	33	-3.3%	35	32,827	26	27.71	23
0.414	**31**	**6.86%**	**10**	**4.5**	**29**	**17%**	**7**	**-3.3**	**33**	**4.5%**	**9**	**-1.0%**	**27**	**31,191**	**27**	**23.99**	**28**
0.416	30	N/A	N/A	6.6	7	9%	1	3.7	18	2.2%	24	-7.0%	40	23,689	36	18.67	35
0.330	41	4.03%	37	3.7	34	26%	31	-3.7	34	3.7%	10	8.3%	3	23,576	37	18.58	36
0.289	43	4.57%	35	4.4	31	29%	38	-7.2	39	1.0%	39	-0.5%	25	47,641	20	42.99	17
0.632	13	N/A	N/A	2.9	39	23%	19	4.0	17	2.0%	26	22.3%	1	24,639	33	19.42	33
0.483	25	N/A	N/A	5.8	12	N/A	N/A	6.6	9	2.3%	19	-11.4%	43	27,142	31	21.39	30
0.610	15	5.23%	24	3.3	35	16%	4	-4.0	35	8.3%	3	5.9%	8	23,951	35	17.58	37
0.368	36	7.27%	4	2.9	40	22%	14	-5.8	38	2.4%	17	6.1%	7	10,825	41	8.53	40
0.570	18	N/A	N/A	4.2	32	N/A	N/A	0.0	27	15.5%	2	-11.4%	42	42,428	23	N/A	N/A
0.387	35	5.67%	17	4.1	33	19%	11	-7.2	40	2.0%	27	-1.9%	31	28,250	30	21.54	29
0.571	17	5.20%	26	4.5	30	25%	30	-11.7	41	1.1%	38	-11.7%	44	47,806	19	34.83	21
0.368	38	5.45%	23	2.7	41	24%	22	-16.0	42	2.2%	23	0.1%	23	17,788	40	14.02	39
0.346	40	4.07%	36	3.3	36	19%	8	-2.3	32	1.9%	31	-2.8%	34	20,069	38	38.76	19
0.441	29	4.90%	31	2.9	38	27%	34	-1.8	30	1.9%	30	-1.8%	29	24,073	34	18.69	34
0.308	42	N/A	N/A	2.1	42	27%	32	-1.0	29	2.7%	13	-1.9%	30	18,632	39	14.69	38
0.413	32	5.20%	27	3.1	37	43%	40	-4.1	36	2.1%	25	4.6%	12	25,785	32	20.32	32
0.368	37	5.49%	21	2.0	43	25%	28	-25.7	44	3.0%	12	-5.1%	39	5,730	43	4.52	42
0.244	44	3.70%	38	2.0	44	28%	37	-21.9	43	1.4%	36	1.9%	15	7,199	42	5.67	41
0.542		**5.83%**		**5.0**		**23%**		**0.0**		**3.4%**		**0.7%**		**42,568**		**34.14**	

Overall Change Score

	Overall		Overall		Education		Researchers		Publications		Business R&D		Govt. R&D		Venture Capital	
Country	1999-2011 Rank	1999-2011 Score	2009-2011 Rank	2009-2011 Score	Percent Change 1999-2008	Rank	Percent Change 1999-2008	Rank	Absolute Change 1996-2009	Rank	Percent Change 1999-2008	Rank	Percent Change 1999-2008	Rank	Percent Change 2000-2008	Rank
China	1	21.5	5	14.4	N/A	N/A	145.1%	4	0.23	16	179%	2	-1%	27	N/A	N/A
S. Korea	2	18.7	7	13.7	65.3%	6	97.3%	7	0.74	8	43%	12	35%	10	N/A	N/A
Cyprus	3	18.5	16	10.8	N/A	N/A	163.4%	2	-0.62	38	70%	5	70%	1	N/A	N/A
Slovenia	4	17.3	2	16.7	N/A	N/A	48.7%	15	1.31	2	30%	15	0%	25	N/A	N/A
Estonia	5	16.4	22	9.8	19.2%	22	24.3%	25	0.84	5	157%	3	43%	6	N/A	N/A
Czech Rep.	6	15.5	11	11.9	45.5%	12	111.0%	5	0.81	6	28%	17	25%	12	115.0%	2
Latvia	7	14.2	44	1.0	N/A	N/A	46.3%	16	-0.25	29	106%	4	43%	5	N/A	N/A
Singapore	8	13.9	42	5.5	N/A	N/A	80.4%	8	2.08	1	36%	13	1%	24	N/A	N/A
EU-10	**9**	**13.5**	**8**	**13.5**	**138.5%**	**2**	**24.7%**	**24**	**0.30**	**12**	**13%**	**22**	**3%**	**20**	**6.0%**	**9**
Portugal	10	13.4	1	18.1	93.1%	4	70.2%	10	1.08	3	N/A	N/A	7%	18	-57.5%	20
Hungary	11	13.3	12	11.7	71.1%	5	35.2%	18	0.27	13	53%	10	12%	15	33.5%	3
Lithuania	12	12.6	36	6.3	N/A	N/A	2.5%	41	0.26	15	N/A	N/A	42%	7	N/A	N/A
India	13	12.2	20	10.6	N/A	N/A	21.6%	29	-0.09	27	14%	21	-16%	38	N/A	N/A
Austria	14	11.7	21	10.3	49.2%	10	67.4%	11	0.08	22	60%	7	36%	8	-52.0%	19
Chile	15	10.7	14	11.3	N/A	N/A	107.0%	6	-0.29	30	256%	1	-19%	39	N/A	N/A
Greece	16	10.5	6	13.7	8.6%	26	27.7%	23	0.78	7	46%	11	9%	16	-77.9%	25
Japan	17	10.5	29	7.9	22.4%	20	12.2%	36	-0.73	40	25%	18	-7%	30	169.2%	1
Slovakia	18	9.7	4	15.3	N/A	N/A	19.6%	30	-0.07	25	-50%	40	-21%	40	N/A	N/A
Finland	19	9.4	19	10.6	0.8%	27	15.1%	33	-0.45	34	9%	24	-11%	33	24.6%	6
Denmark	20	9.3	37	6.3	48.6%	11	58.6%	13	0.27	14	29%	16	1%	23	27.4%	4
Australia	21	9.2	9	12.0	43.7%	13	16.9%	32	-0.05	24	57%	8	16%	13	6.1%	8
Indonesia	22	8.9	3	16.3	N/A	N/A	N/A	N/A	-0.37	31	N/A	N/A	-35%	41	N/A	N/A
Ireland	23	8.8	41	5.7	55.4%	9	32.8%	19	0.91	4	-13%	37	67%	2	25.8%	5
UK	24	8.1	24	9.1	42.4%	14	45.5%	17	-0.61	36	-2%	30	2%	22	-7.5%	14
Brazil	25	8.0	23	9.7	N/A	N/A	71.1%	9	-0.69	39	13%	23	52%	4	N/A	N/A
Mexico	26	8.0	15	10.9	23.2%	19	51.5%	14	-0.37	32	68%	6	14%	14	N/A	N/A
Poland	27	7.8	10	12.0	167.8%	1	3.4%	40	0.15	19	-30%	38	-10%	31	-58.9%	21
EU-25	**28**	**7.7**	**31**	**7.6**	**59.0%**	**8**	**29.6%**	**22**	**-0.01**	**23**	**2%**	**28**	**4%**	**21**	**5.0%**	**10**
Netherlands	29	7.4	26	8.7	59.1%	7	17.0%	31	0.18	17	-11%	34	-16%	37	-49.2%	17
Turkey	30	7.2	18	10.7	N/A	N/A	158.6%	3	0.13	20	53%	9	35%	9	N/A	N/A
Spain	31	7.1	25	8.9	23.5%	18	65.7%	12	0.33	11	32%	14	53%	3	2.0%	11
Argentina	32	6.9	17	10.8	N/A	N/A	23.5%	27	0.11	21	0%	29	-12%	35	N/A	N/A
Russia	33	6.7	30	7.8	N/A	N/A	-19.5%	42	-0.41	33	-42%	39	32%	11	N/A	N/A
Canada	34	6.6	34	6.8	18.9%	23	23.9%	26	-0.97	42	9%	25	8%	17	-73.2%	24
Malaysia	35	6.6	13	11.6	N/A	N/A	286.1%	1	-0.46	35	23%	19	N/A	N/A	N/A	N/A
EU-15	**36**	**6.5**	**35**	**6.6**	**34.3%**	**15**	**29.8%**	**21**	**-0.10**	**28**	**-3%**	**32**	**5%**	**19**	**-0.3%**	**12**
France	37	6.1	39	5.9	31.2%	16	22.0%	28	-0.61	37	-13%	36	0%	26	8.2%	7
Germany	38	5.9	32	7.6	N/A	N/A	12.7%	35	-0.08	26	7%	26	-11%	34	-12.7%	16
Sweden	39	5.4	40	5.8	20.3%	21	8.9%	37	-0.82	41	-10%	33	-14%	36	-11.2%	15
Belgium	40	5.2	38	6.2	24.3%	17	13.7%	34	0.40	9	-12%	35	-10%	32	-5.7%	13
NAFTA	41	4.8	33	7.3	12.3%	24	8.6%	38	-1.61	43	17%	20	-2%	29	-60.2%	22
South Africa	42	4.6	28	8.0	N/A	N/A	N/A	N/A	0.39	10	N/A	N/A	N/A	N/A	N/A	N/A
U.S.	**43**	**4.1**	**27**	**8.4**	**9.4%**	**25**	**6.4%**	**39**	**-2.09**	**44**	**4%**	**27**	**-1%**	**28**	**-67.5%**	**23**
Italy	44	2.6	43	5.2	99.0%	3	31.1%	20	0.16	18	-3%	31	N/A	N/A	-50.0%	18
Average		**9.8**		**9.8**	**47.2%**		**50.4%**		**-0.04**		**27%**		**16%**		**-6.4%**	

New Firms		E-Government		IT Investments		Broadband		Doing Business		FDI		Trade		GDP per Adult		Productivity	
Percent Change 2005-2009	Rank	Percent Change 2003-2010	Rank	Percent Change 2003-2010	Rank	Absolute Change 2002-2009	Rank	Absolute Change* 2005-2010	Rank	Percent Change 1999-2009	Rank	Absolute Change* 1999-2009	Rank	Percent Change 1999-2009	Rank	Percent Change 1999-2009	Rank
N/A	N/A	11%	14	-1.6%	18	7.5%	38	5.75	1	-28%	16	2.5%	14	172.3%	1	174%	1
85.5%	3	65%	3	-0.5%	17	26.6%	5	2.67	8	-86%	40	-8.4%	42	63.2%	9	74%	9
N/A	N/A	N/A	N/A	N/A	N/A	19.5%	18	0.00	20	77%	8	-11.4%	43	38.8%	24	N/A	N/A
60.6%	5	-9%	25	42.5%	3	20.8%	17	3.66	5	102%	7	2.1%	15	52.6%	14	56%	15
18.2%	14	-22%	31	N/A	N/A	19.1%	19	0.38	17	34%	11	7.8%	1	78.6%	6	77%	7
55.1%	6	30%	7	3.6%	13	13.1%	32	3.69	3	-77%	38	6.3%	3	53.7%	12	69%	10
-16.8%	37	56%	5	N/A	N/A	18.2%	24	3.67	4	-57%	29	3.8%	6	84.6%	5	86%	5
27.5%	9	-2%	17	-14.5%	33	23.0%	12	0.13	19	-61%	32	2.9%	13	46.1%	19	47%	20
42.8%	**7**	**-11%**	**26**	**24.7%**	**5**	**14.4%**	**30**	**1.49**	**12**	**N/A**	**N/A**	**3.5%**	**9**	**59.7%**	**11**	**77%**	**6**
6.6%	21	-24%	33	3.5%	14	14.9%	29	3.63	6	-54%	26	0.7%	18	N/A	N/A	28%	37
94.6%	2	62%	4	2.6%	15	17.7%	25	2.85	7	188%	4	3.3%	11	48.3%	16	65%	11
19.5%	12	-8%	23	N/A	N/A	18.7%	22	1.52	11	-41%	22	-0.7%	24	90.9%	2	92%	2
110.1%	1	-30%	36	42.9%	2	0.6%	43	-3.40	42	378%	2	-3.2%	36	89.5%	4	91%	4
-9.9%	33	0%	15	-7.6%	25	16.5%	28	-3.31	41	-32%	18	3.6%	8	34.9%	30	36%	28
-0.4%	24	-27%	34	12.0%	9	8.4%	37	-2.25	37	-10%	13	3.6%	7	46.5%	18	48%	17
62.5%	4	74%	2	3.7%	12	17.2%	26	-0.48	26	103%	6	-2.7%	32	53.6%	13	47%	19
-3.5%	28	28%	8	-2.4%	19	24.3%	8	0.18	18	62%	10	-1.5%	28	33.0%	33	40%	25
22.5%	11	-9%	24	12.6%	8	14.3%	31	1.92	10	-71%	37	4.3%	5	75.7%	7	74%	8
30.0%	8	-21%	30	21.1%	6	23.6%	10	-2.06	35	-99%	42	-6.2%	41	37.5%	25	45%	21
-22.2%	38	-3%	19	-17.5%	36	29.5%	1	1.48	13	-88%	41	-0.1%	20	27.2%	41	27%	41
-0.8%	25	-6%	21	-24.7%	39	23.1%	11	-1.23	32	62%	9	-0.4%	22	39.5%	22	35%	30
17.0%	16	-44%	40	49.5%	1	0.7%	42	4.66	2	-32%	20	-6.2%	40	62.4%	10	64%	12
-26.4%	39	-19%	28	-13.2%	30	21.4%	16	-0.28	24	-69%	35	-1.0%	25	29.2%	35	44%	22
-3.1%	27	0%	16	-3.1%	20	27.3%	4	0.79	16	-68%	34	-1.2%	26	33.1%	32	41%	23
22.8%	10	-36%	39	-5.5%	22	5.5%	40	-0.18	23	-56%	28	1.8%	16	39.2%	23	40%	24
10.4%	18	-33%	37	28.6%	4	8.6%	35	-0.11	21	-36%	21	0.0%	19	16.7%	43	28%	38
9.4%	19	-28%	35	1.2%	16	12.6%	33	-0.11	22	-59%	30	3.4%	10	65.2%	8	57%	14
-3.8%	**29**	**-3%**	**20**	**-6.6%**	**24**	**22.6%**	**13**	**-0.76**	**27**	**-12%**	**15**	**-0.2%**	**21**	**37.1%**	**26**	**31%**	**31**
18.4%	13	26%	9	-6.0%	23	28.3%	3	-1.33	33	-70%	36	3.3%	12	35.5%	27	29%	36
-12.6%	35	-45%	42	-11.4%	28	8.5%	36	-1.12	31	454%	1	-18.2%	44	41.0%	21	31%	32
-42.1%	40	79%	1	-20.4%	37	18.6%	23	-0.80	28	-47%	24	-2.1%	30	28.0%	40	25%	42
-16.0%	36	-34%	38	20.1%	7	10.2%	34	-3.73	43	-65%	33	6.3%	2	50.1%	15	51%	16
-47.2%	42	48%	6	-13.4%	31	N/A	N/A	1.37	14	183%	5	-3.6%	37	90.7%	3	92%	3
5.0%	22	16%	13	5.7%	11	26.0%	7	-0.97	29	-60%	31	-2.9%	34	28.5%	38	29%	35
1.0%	23	17%	12	-15.7%	35	6.0%	39	1.30	15	-55%	27	-2.8%	33	44.5%	20	58%	13
-6.0%	**30**	**-3%**	**18**	**-10.7%**	**27**	**24.0%**	**9**	**-1.00**	**30**	**N/A**	**N/A**	**-0.5%**	**23**	**35.1%**	**29**	**30%**	**34**
7.6%	20	20%	11	-14.6%	34	28.9%	2	2.20	9	-29%	17	-4.4%	38	28.7%	37	28%	39
-1.8%	26	-20%	29	-8.8%	26	26.5%	6	-2.91	40	-85%	39	4.6%	4	35.4%	28	31%	33
17.1%	15	-23%	32	-13.6%	32	22.4%	14	-1.45	34	-10%	14	0.7%	17	34.1%	31	36%	29
14.4%	17	23%	10	-12.4%	29	21.6%	15	-2.38	38	-32%	19	-2.5%	31	30.3%	34	27%	40
-9.8%	32	-13%	27	10.2%	10	17.0%	27	-2.18	36	-42%	23	-1.5%	27	28.4%	39	36%	27
-47.2%	41	-45%	41	N/A	N/A	1.0%	41	-0.36	25	194%	3	-4.5%	39	47.0%	17	48%	18
-12.0%	**34**	**-6%**	**22**	**-5.0%**	**21**	**18.9%**	**21**	**-2.52**	**39**	**-50%**	**25**	**-1.5%**	**29**	**29.1%**	**36**	**38%**	**26**
-6.4%	31	-53%	43	-20.6%	38	19.1%	20	-4.09	44	17%	12	-3.0%	35	18.3%	42	22%	43
11.4%		**9%**		**1.6%**		**19.1%**		**0.05**		**4%**		**-0.5%**		**48.7%**		**51%**	

Box 1: What if U.S. States were Countries?

Just how strong are U.S. states compared to other nations in terms of innovation-based competitiveness? One of the problems with comparing the United States as a whole to leading countries like Singapore or Finland is that these nations are part of larger regional economies whose innovation-based competitiveness differs significantly by nation. For every Finland which ranks high, there is a Greece which ranks low. If these nations were states in "the United States of Europe" it would be clear that the United States lead was even higher since leading European "states" would be subsumed into the overall EU score. And while Singapore ranks high, for example, its immediate neighbor Malaysia does not. The United States is no different. Some states lead in innovation and others do not. As such, the United States suffers in international comparisons because it is made up a large number of states with very different economic structures and innovation capabilities.

As a result, another way to analyze U.S. innovation-based competitiveness is to compare U.S. states to nations. Of the sixteen indicators used in this report there are state-based comparable data for seven: education, researchers, corporate R&D, broadband, venture capital, GDP (or Gross State Product [GSP]) per worker, and productivity. Standard deviations from these seven indicators were generated, weighted and complied for a final score of U.S. states and nations. Education, researchers, and broadband are weighted 2.5 each, venture capital, GDP per worker, and productivity are weighted 3 each and corporate R&D is weighted 5.

When viewed this way, it's clear that if they were nations the top U.S. states would lead the world. Indeed, Massachusetts, California, Connecticut, New Jersey, Washington, Delaware, Maryland, Colorado, and New Hampshire are more innovative than any nation in the world. Only Finland breaks into the top 10. In other words, nine states lead all nations in the world in terms of innovation-based competitiveness. If it were a nation, Massachusetts would lead the world by a large margin, scoring 18 points above California and 38 points higher than Finland. Massachusetts has set itself apart in several indicators, as the only state or country to have business R&D investment levels over 5 percent of domestic product, over 0.5 percent of domestic product in venture capital, and over two-thirds of its college aged population having a college degree. But even the ninth most innovative state, New Hampshire, leads the EU-25 on all measures but venture capital and broadband. But the diversity within the United States is quite significant. The lowest scoring U.S. state, Mississippi, ranks eighteenth amongst the countries below Slovenia and above Italy. And while it ranks above Italy on education and productivity, it scores lower on corporate R&D, broadband and venture capital. But many nations are making rapid progress on the factors that states now lead in. For example, the U.S. ranks 25th in rate of progress in education and 26th in productivity. So while many U.S. states lead the world, that leadership position is not assured.

Some may argue that the states that outperform the rest of the world are small and therefore likely have little impact on overall U.S. competitiveness. But in fact, California's GSP is larger than the GDP of four nations in the top twenty (Finland, Sweden, Denmark and Singapore) — *combined*. Moreover, if the nine states that outperform all countries examined were a nation, its GDP of $4.1 trillion would make it the fourth largest economy in the world. In other words, if the top nine states were their own country not only would they be the global leader in innovation and competitiveness (by a large margin) they would have a larger GDP than Germany.

This points to a key characteristic of the global innovation economy: within and between nations different places have different capabilities and structures with regard to innovation-based competitiveness. However, these are not destiny. As we have seen at the state level, some states have made significant progress over the last decade. For example, in ITIF's State New Economy Index series, Rhode Island moved up 13 spots from 29 to 16 from 1999 to 2010, while Maryland increased its rank from 11 to 3. In the case of Rhode Island they put in place the highest R&D tax credit in the nation, while Maryland benefited from increased national laboratory funding and state programs to help transfer the technology from those labs into the marketplace. Likewise, nations like China and South Korea and regions like Eastern Europe made dramatic improvements over the last decade. Korea put in place an array of policies to help drive industrial innovation, including support for programs to spur broadband deployment and adoption and initiatives to help small and mid-sized manufacturers adopt the latest technologies. China expanded funding for its research universities and established generous incentives for research, including a strong R&D tax credit. Eastern Europe lowered corporate tax rates and emphasized increasing college graduates.

One advantage nations have though, over states, is that they have more control over the key innovation components of their economy. Their tax and expenditure levels are greater, so they can more easily influence innovation-based activities with tax policies and public investments. In many cases, they have more control over innovation systems, so they can more easily influence digital transformation. For example, one reason the United States lags so far behind in the adoption of intelligent transportation systems is that in nations like Japan, South Korea, and Singapore the national government controls transportation policy and can more easily drive large scale transformations that require coordination. The same is true with regard to health IT, where nations like Denmark, Finland, the Netherlands lead the world. The lesson for the United States from this is that if the U.S. wants 9 (or even more) of its states to continue to be the world leaders in 2021, it will need to adopt national innovation and competitiveness policies, including policies to financially support state innovation policy efforts.

Index of Innovation-based Competitiveness: U.S. States vs. Nations

Country/State	Rank	Score	State Rank if Country	Education	Researchers	Corporate R&D	Broadband Penetration	Venture Capital	GDP per Adult	Productivity
Massachusetts	1	66.05	1	68.4%	21.87	5.53%	29.2%	0.573%	89,146	68.57
California	2	44.71	1	50.0%	12.11	3.56%	31.6%	0.495%	84,032	80.69
Connecticut	3	41.09	1	65.6%	13.15	4.45%	31.6%	0.073%	101,926	84.83
New Jersey	4	34.62	1	62.0%	11.58	3.88%	31.9%	0.122%	88,068	75.93
Washington	5	33.20	1	53.4%	12.45	4.09%	26.2%	0.190%	78,921	73.53
Delaware	6	31.26	1	49.4%	16.30	2.39%	27.2%	0.029%	120,568	98.67
Maryland	7	25.54	1	63.1%	21.81	1.39%	31.3%	0.107%	77,185	69.49
Colorado	8	23.70	1	59.3%	11.78	2.21%	26.0%	0.200%	79,653	68.29
New Hampshire	9	18.88	1	60.4%	8.16	3.14%	26.6%	0.066%	72,041	59.70
Finland	10	18.25		38.3%	16.93	2.31%	28.8%	0.235%	55,494	44.69
New York	11	18.24	2	57.3%	11.91	0.99%	28.4%	0.079%	94,592	82.95
Michigan	12	18.15	2	45.2%	9.19	4.14%	21.7%	0.035%	64,116	62.84
Minnesota	13	17.99	2	55.2%	9.40	2.63%	23.0%	0.104%	82,114	61.92
Sweden	14	14.88		38.5%	10.92	2.20%	31.8%	0.210%	60,898	46.79
Oregon	15	14.83	3	50.7%	10.21	2.29%	27.3%	0.063%	70,486	65.14
Singapore	16	13.94		38.0%	12.10	1.39%	24.7%	0.240%	74,602	58.80
Denmark	17	13.29		43.1%	11.53	1.66%	37.9%	0.155%	59,639	45.35
Virginia	18	13.01	5	59.1%	11.62	1.26%	23.9%	0.065%	82,408	66.71
Illinois	19	12.69	5	52.2%	9.03	1.84%	27.0%	0.032%	82,011	66.70
Utah	20	12.46	5	46.7%	9.87	1.67%	24.4%	0.168%	75,767	55.40
Pennsylvania	21	11.85	5	49.0%	11.36	1.95%	23.4%	0.077%	72,535	59.24
Rhode Island	22	11.75	5	55.2%	13.86	0.88%	27.3%	0.084%	74,162	62.19
Japan	23	11.49		55.1%	11.77	2.73%	24.9%	0.070%	54,795	38.37
S. Korea	24	11.38		57.9%	9.67	2.25%	34.8%	0.171%	42,382	25.33
U.S.		**11.21**		**41.6%**	**9.74**	**1.86%**	**25.8%**	**0.120%**	**76,865**	**55.16**
North Carolina	25	10.47	7	46.1%	10.12	1.75%	23.8%	0.073%	72,735	65.37
Vermont	26	9.15	7	63.5%	11.07	1.68%	20.0%	0.057%	65,870	53.27
Texas	27	8.04	7	42.3%	7.58	1.21%	27.7%	0.056%	83,681	67.80
New Mexico	28	7.55	7	44.8%	21.48	0.76%	18.8%	0.007%	66,781	64.15
Alaska	29	7.49	7	42.1%	7.12	0.13%	24.6%	0.000%	108,489	96.46
Hawaii	30	7.48	7	52.4%	9.38	0.35%	32.0%	0.011%	81,284	73.57
Arizona	31	6.01	7	44.7%	7.11	1.56%	25.8%	0.045%	67,967	64.45
Belgium	32	5.24		42.3%	8.89	1.13%	29.4%	0.103%	59,312	55.93

Index of Innovation-based Competitiveness: U.S. States vs. Nations (continued)

Country/State	Rank	Score	State Rank if Country	Education	Researchers	Corporate R&D	Broadband Penetration	Venture Capital	GDP per Adult	Productivity
France	33	5.20		40.7%	8.91	1.02%	31.6%	0.126%	57,157	53.22
UK	34	5.04		38.4%	9.20	0.89%	29.6%	0.200%	57,843	45.62
Netherlands	35	4.97		39.8%	6.34	0.87%	35.6%	0.103%	65,174	56.94
Canada	36	4.03		55.9%	8.56	0.88%	30.6%	0.079%	60,238	43.91
Ohio	37	4.00	12	43.5%	8.48	1.57%	23.3%	0.025%	67,970	58.42
Indiana	38	3.89	12	40.2%	7.50	1.98%	19.1%	0.064%	67,402	54.36
NAFTA		3.15		37.4%	7.52	1.41%	22.1%	0.111%	70,853	51.03
Georgia	39	2.95	12	46.3%	6.86	0.71%	25.9%	0.075%	69,085	63.83
Kansas	40	2.81	12	52.8%	6.56	1.11%	24.3%	0.007%	74,222	58.30
Australia	41	2.77		41.7%	8.83	1.06%	24.4%	0.135%	64,152	44.66
Germany	42	2.60		23.9%	8.06	1.67%	30.4%	0.086%	57,034	52.60
Wisconsin	43	2.59	14	46.6%	7.51	1.46%	22.9%	0.010%	70,914	55.26
Idaho	44	2.09	14	42.4%	8.83	1.39%	22.8%	0.028%	62,255	57.77
Wyoming	45	1.35	14	41.3%	5.52	0.12%	20.8%	0.032%	102,646	75.22
Florida	46	1.33	14	49.9%	4.77	0.62%	28.3%	0.040%	70,389	62.88
Iowa	47	1.01	14	45.8%	6.86	0.93%	19.3%	0.064%	77,258	56.49
Nevada	48	0.65	14	36.2%	4.63	0.44%	30.4%	0.012%	84,260	70.11
Ireland	49	0.52		45.1%	6.73	0.66%	21.6%	0.133%	63,583	54.99
Missouri	50	0.34	15	45.0%	7.21	1.19%	23.8%	0.008%	66,596	55.28
EU-15		**0.18**		**32.4%**	**7.79**	**1.04%**	**27.3%**	**0.125%**	**55,688**	**48.20**
Nebraska	51	-0.70	15	49.8%	6.81	0.61%	22.7%	0.000%	80,595	55.18
North Dakota	52	-1.12	15	48.9%	8.09	0.44%	19.7%	0.031%	81,317	52.96
EU-25		**-2.24**		**31.8%**	**7.33**	**0.98%**	**25.4%**	**0.120%**	**53,231**	**46.01**
Montana	53	-2.38	15	51.1%	8.88	0.39%	19.6%	0.042%	61,729	55.90
Louisiana	54	-2.38	15	35.8%	6.39	0.18%	25.8%	0.005%	81,645	67.29
Tennessee	55	-3.54	15	40.1%	7.62	0.67%	20.7%	0.020%	66,426	57.24
Alabama	56	-3.71	15	39.7%	6.48	1.08%	18.6%	0.026%	60,942	56.98
Maine	57	-3.78	15	50.0%	7.92	0.55%	21.0%	0.017%	59,787	52.23
South Dakota	58	-4.43	15	45.9%	5.37	0.37%	20.0%	0.002%	79,108	57.46
South Carolina	59	-4.53	15	42.4%	6.89	0.94%	20.6%	0.005%	58,286	53.67
Austria	60	-4.84		19.4%	8.92	1.24%	22.1%	0.027%	62,708	50.00
Oklahoma	61	-5.57	16	40.8%	5.86	0.39%	23.2%	0.003%	66,429	58.01
Spain	62	-5.59		40.8%	7.11	0.56%	21.6%	0.126%	47,359	41.88

Country/State	Rank	Score	State Rank if Country	Education	Researchers	Corporate R&D	Broadband Penetration	Venture Capital	GDP per Adult	Productivity
Kentucky	63	-7.93	17	36.2%	5.80	0.59%	20.6%	0.007%	59,949	54.33
Slovenia	64	-9.94		30.0%	7.49	1.04%	23.7%	N/A	42,718	30.55
Arkansas	65	-11.05	18	34.5%	5.05	0.36%	20.4%	0.000%	58,184	51.70
West Virginia	66	-13.03	18	32.5%	6.14	0.40%	15.6%	0.005%	53,443	50.27
Mississippi	67	-13.19	18	34.6%	6.15	0.32%	14.9%	0.000%	53,228	52.19
Italy	68	-15.36		19.9%	4.32	0.49%	20.5%	0.040%	47,641	42.99
Czech Rep.	69	-17.60		16.0%	6.19	0.77%	13.2%	0.120%	37,567	26.24
Estonia	70	-17.87		35.8%	6.40	0.44%	22.5%	N/A	29,637	21.12
Portugal	71	-18.48		23.2%	5.60	0.56%	17.4%	0.032%	N/A	27.02
Greece	72	-18.85		28.2%	4.54	0.18%	17.2%	0.011%	47,806	34.83
Lithuania	73	-20.18		41.7%	5.99	0.17%	19.3%	N/A	27,142	21.39
Hungary	74	-20.99		24.0%	4.53	0.40%	18.8%	0.045%	29,631	25.46
Russia	75	-21.31		55.5%	6.59	0.30%	9.2%	0.002%	23,576	18.58
EU-10		**-21.66**		**28.6%**	**4.65**	**0.37%**	**14.5%**	**0.049%**	**31,191**	**23.99**
Cyprus	76	-23.38		22.9%	2.18	0.07%	20.2%	N/A	42,428	N/A
Latvia	77	-24.21		37.3%	4.08	0.17%	18.6%	N/A	23,689	18.67
Poland	78	-24.82		32.1%	3.97	0.18%	12.9%	0.022%	28,250	21.54
Slovakia	79	-26.17		18.4%	5.25	0.16%	14.3%	N/A	32,827	27.71
Turkey	80	-30.95		15.5%	2.22	0.31%	8.5%	N/A	20,069	38.76
Mexico	81	-31.55		19.7%	0.87	0.17%	8.8%	0.040%	24,073	18.69
Brazil	82	-31.81		11.0%	1.47	0.42%	5.9%	0.110%	17,788	14.02
Chile	83	-33.88		6.2%	2.21	0.31%	9.6%	0.003%	23,951	17.58
Malaysia	84	-34.73		19.0%	0.89	0.42%	6.1%	N/A	24,639	19.42
China	85	-35.54		12.2%	1.89	1.05%	7.7%	0.004%	10,825	8.53
Argentina	86	-35.56		8.0%	2.37	0.12%	10.6%	N/A	25,785	20.32
South Africa	87	-41.08		N/A	1.39	0.32%	1.0%	N/A	18,632	14.69
India	88	-43.51		8.1%	0.37	0.20%	0.7%	0.007%	5,730	4.52
Indonesia	89	-51.09		11.4%		N/A	0.7%	N/A	7,199	5.67
Average				**40.0%**	**7.96**	**1.22%**	**22.0%**	**0.079%**	**60,038**	**49.93**

Source: World Bank, 1999-2006 data.

Higher Education Attainment

Percentage of adults aged 25-34 with a tertiary degree

Why Is This Important? Innovation and productivity are supported by a highly educated workforce, so higher education attainment has become an important component of economic success, particularly in higher wage nations that can compete less effectively in lower skilled, routinized work.

Europe vs. the United States: The United States leads Europe in terms of higher education attainment, with EU-15 levels 78 percent of U.S. levels and EU-10 levels just 69 percent. A few EU nations, however, exceed U.S. levels, including Denmark and Ireland, which have made higher education attainment a key building block of their development strategies. But some other European nations rank relatively low. For example, Portugal and Italy score at just 56 percent and 48 percent of the United States level, respectively. Germany scores at just 58 percent of the United States level in part reflecting its strong tradition of technical education, as opposed to four-year college education, and longer higher education program lengths which graduate fewer students. While South Korea leads the world there are several U.S. states with even higher scores. In Massachusetts, for example over two-thirds of the college aged population has a college degree.

Indeed, a country's graduation rates seem to be at least loosely connected to the length of a degree program. For example, countries with short program lengths such as Australia, Denmark, Finland, Iceland, Italy, the Netherlands, New Zealand, Norway, and Poland tend to have higher graduation rates, whereas countries like Germany and Austria, with longer program lengths graduate fewer students.[17]

When it comes to trends, however, the picture is quite different. Growth in higher education attainment in the United States between 1999 and 2009 (9.4%) was slower than all EU countries besides Finland and Greece. In contrast the share of twenty-five to thirty-four year-olds in the EU-15 with a tertiary degree increased by 34 percent from 1999 to 2009, in part because of very strong growth in nations like Italy (albeit from a low base), Austria and Denmark. In addition, some EU-10 nations increased even faster, including Poland (168 percent) and Hungary (71 percent). The trend since 2006 was essentially no different, with the United States behind the EU-10, and EU-15, and significantly slower than several individual countries. For example, Poland, Italy, and Hungary all saw three times as much progress as the United States. However, the United States did surpass three western European countries in terms of growth: Sweden, Belgium and Finland.

Europe and the United States vs. the Rest of the World: Despite the fact that the United States led for many years in higher education attainment, it no longer does. In fact, South Korea leads with an over 40 percent higher rate, while Canada, Russia and Japan lead the United States by over 30 percent. And all four have attainment rates over 70 percent higher than EU-15 rates. Most developing nations have much lower rates, with rates in Indonesia, Brazil, India, Argentina and Chile below 30 percent of U.S. rates.

The United States is losing ground relative to other nations, and in fact had the slowest growth rate of any nation examined where data are available. In contrast, the EU-15 fared better, with growth rates exceeding nations like Mexico, Canada, and Japan, but still behind countries like Korea and Australia. Over the last three years Brazil has seen the most improvement, increasing the number of twenty-five to thirty-four year-olds with a tertiary degree by over one-third. Within Asia, South Korea has grown the fastest at 13 percent with Japan and Singapore growing less than 4 percent since 2006.

Rank	Country	Score	Rank	Country	Percent Change 1999-2008
1	S. Korea	57.9%	1	Poland	167.8%
2	Canada	55.9%	**2**	**EU-10**	**138.5%**
3	Russia	55.5%	3	Italy	99.0%
4	Japan	55.1%	4	Portugal	93.1%
5	Ireland	45.1%	5	Hungary	71.1%
6	Denmark	43.1%	6	S. Korea	65.3%
7	Belgium	42.3%	7	Netherlands	59.1%
8	Lithuania	41.7%	**8**	**EU-25**	**59.0%**
9	Australia	41.7%	9	Ireland	55.4%
10	**U.S.**	**41.6%**	10	Austria	49.2%
11	Spain	40.8%	11	Denmark	48.6%
12	France	40.7%	12	Czech Rep.	45.5%
13	Netherlands	39.8%	13	Australia	43.7%
14	Sweden	38.5%	14	UK	42.4%
15	UK	38.4%	**15**	**EU-15**	**34.3%**
16	Finland	38.3%	16	France	31.2%
17	Singapore	38.0%	17	Belgium	24.3%
18	NAFTA	37.4%	18	Spain	23.5%
19	Latvia	37.3%	19	Mexico	23.2%
20	Estonia	35.8%	20	Japan	22.4%
21	**EU-15**	**32.4%**	21	Sweden	20.3%
22	Poland	32.1%	22	Estonia	19.2%
23	**EU-25**	**31.8%**	23	Canada	18.9%
24	Slovenia	30.0%	24	NAFTA	12.3%
25	**EU-10**	**28.6%**	**25**	**U.S.**	**9.4%**
26	Greece	28.2%	26	Greece	8.6%
27	Hungary	24.0%	27	Finland	0.8%
28	Germany	23.9%		Cyprus	N/A
29	Portugal	23.2%		China	N/A
30	Cyprus	22.9%		Lithuania	N/A
31	Italy	19.9%		Russia	N/A
32	Mexico	19.7%		India	N/A
33	Austria	19.4%		Latvia	N/A
34	Malaysia	19.0%		Slovakia	N/A
35	Slovakia	18.4%		Indonesia	N/A
36	Czech Rep.	16.0%		Malaysia	N/A
37	Turkey	15.5%		Slovenia	N/A
38	China	12.2%		Argentina	N/A
39	Indonesia	11.4%		Chile	N/A
40	Brazil	11.0%		South Africa	N/A
41	India	8.1%		Singapore	N/A
42	Argentina	8.0%		Brazil	N/A
43	Chile	6.2%		Turkey	N/A
	South Africa	N/A		Germany	N/A
Average		**30.6%**	**Average**		**47.2**

Source: OECD, 1999-2008 data.

Science and Technology Researchers

Science and technology researchers per 1,000 employed[18]

Why Is This Important? Scientists and engineers are key drivers of innovation and as global economies become more innovation-based, they are even more important. Indeed, in 2008 there were over 30 percent more persons employed in R&D than in 1995.[19]

Europe vs. the United States: Europe lags behind the United States in the number of researchers, with U.S. researcher intensity over 25 percent higher than the EU-15 and twice as high as the EU-10. The strong science and technology base of the United States economy established after World War II and reenergized with strong IT and biotechnology leadership more recently, coupled with longstanding high-skill immigration flows, mean that the United States is among the world leaders. This is not to say that some European nations do not rank high. In particular, the Nordic nations of Finland, Denmark, and Sweden, with their technology-driven economies, rank above the United States. However, other EU nations rank considerably below U.S. levels, including Germany (83 percent), Spain (73 percent), Ireland (69 percent), the Netherlands (65 percent) and Italy (44 percent). Among EU-10 nations, Slovenia is the only country above the European average.

When it comes to trends though, the situation is different. While both regions saw increases between 1999 and 2008, researcher intensity in the EU-15 grew significantly faster than the United States (24 percent faster. Lagging nations, including Portugal, Spain, and the Czech Republic, made significant gains, all above 50 percent. However, so too did some leading nations, including Austria and Denmark. The EU-10, making rapid progress between 1999 and 2005, slowed significantly between 2005 and 2008 to just 9 percent. While many EU-10 countries have increased their science and technology base over the last decade, the economic recession likely impacted the number of researchers in the public sector as well as the number of researchers working for multinational firms. However, researchers expanded rapidly between 2005 and 2008 in several European countries such as Portugal, Spain and Austria (all by over 15 percent). The United States saw slower growth than all European countries except of Finland, increasing the number of its researchers by less than one percent.

Europe and the United States vs. the Rest of the World: Singapore and Japan lead Europe and the United States, with 24 percent and 21 percent higher scores than the United States and 55 percent and 51 percent higher scores than the EU-15, respectively. Notwithstanding the technical progress in nations like India, Mexico, Brazil, Malaysia, South Africa and China, these developing nations still have much lower shares of their workforce employed as researchers. In fact, India's level is just 4 percent of U.S. levels, and China's is 19 percent. In part because of its rapid expansion of university education and R&D, South Korea is virtually tied with the United States.

Although globally two-thirds of researchers are employed by businesses, this figure significantly differs according to a country's economic mix and national priorities. For example, in the United States over 80 percent of researchers work for businesses, yet only two-thirds do so in Japan and less than one-half do so in European nations.[20]

When it comes to trends, most other nations are making faster progress than the United States, which ranks only ahead of Poland, Lithuania and Russia in rate of growth. Russia is the only country examined here to have seen a decline in the share of workers employed as researchers since 2000, likely reflecting the decline of state-owned enterprises employing researchers. Malaysia and Cyprus grew the fastest, but from very low bases. Turkey and China grew substantially faster than the United States or any European nation, with the number of researchers more than doubling. China's concerted push to be a more technologically-based economy and Turkey's growth in R&D FDI have clearly impacted each country's growth in researchers. But other lagging nations also experienced rapid growth, with Chile doubling (107 percent); Brazil up more than two-thirds, and Mexico up 50 percent. A few nations such as South Korea and Singapore that had relatively high levels of researchers in 1999 made rapid progress, increasing approximately by 80 percent. Finally, Japan and Canada both outpaced the EU-15 and the United States.

Since 2006 Turkey has outpaced all other countries, growing a full 10 percent faster than Slovenia, the second fastest grower. China and Mexico both increased the number researchers by one-fourth. Two NAFTA countries, the United States and Canada, rank in the bottom five countries, each growing by less than 1 percent.

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Science and Technology Researchers (continued)

Science and technology researchers per 1,000 employed

Rank	Country	Score	Rank	Country	Percent Change 1999-2008
1	Finland	16.9	1	Malaysia	286.1%
2	Singapore	12.1	2	Cyprus	163.4%
3	Japan	11.8	3	Turkey	158.6%
4	Denmark	11.5	4	China	145.1%
5	Sweden	10.9	5	Czech Rep.	111.0%
6	**U.S.**	**9.7**	6	Chile	107.0%
7	S. Korea	9.7	7	S. Korea	97.3%
8	UK	9.2	8	Singapore	80.4%
9	Austria	8.9	9	Brazil	71.1%
10	France	8.9	10	Portugal	70.2%
11	Belgium	8.9	11	Austria	67.4%
12	Australia	8.8	12	Spain	65.7%
13	Canada	8.6	13	Denmark	58.6%
14	Germany	8.1	14	Mexico	51.5%
15	**EU-15**	**7.8**	15	Slovenia	48.7%
16	NAFTA	7.5	16	Latvia	46.3%
17	Slovenia	7.5	17	UK	45.5%
18	**EU-25**	**7.3**	18	Hungary	35.2%
19	Spain	7.1	19	Ireland	32.8%
20	Ireland	6.7	20	Italy	31.1%
21	Russia	6.6	**21**	**EU-15**	**29.8%**
22	Estonia	6.4	**22**	**EU-25**	**29.6%**
23	Netherlands	6.3	23	Greece	27.7%
24	Czech Rep.	6.2	**24**	**EU-10**	**24.7%**
25	Lithuania	6.0	25	Estonia	24.3%
26	Portugal	5.6	26	Canada	23.9%
27	Slovakia	5.3	27	Argentina	23.5%
28	**EU-10**	**4.7**	28	France	22.0%
29	Greece	4.5	29	India	21.6%
30	Hungary	4.5	30	Slovakia	19.6%
31	Italy	4.3	31	Netherlands	17.0%
32	Latvia	4.1	32	Australia	16.9%
33	Poland	4.0	33	Finland	15.1%
34	Argentina	2.4	34	Belgium	13.7%
35	Turkey	2.2	35	Germany	12.7%
36	Chile	2.2	36	Japan	12.2%
37	Cyprus	2.2	37	Sweden	8.9%
38	China	1.9	38	NAFTA	8.6%
39	Brazil	1.5	**39**	**U.S.**	**6.4%**
40	South Africa	1.4	40	Poland	3.4%
41	Malaysia	0.9	41	Lithuania	2.5%
42	Mexico	0.9	42	Russia	-19.5%
43	India	0.4		Indonesia	N/A
	Indonesia	N/A		South Africa	N/A
Average		**6.3**	**Average**		**50.4%**

Source: UNESCO, Institute of Statistics, 1999-2008 data.

Business Investment in R&D

Investments in research and development by business as a percentage of GDP

Why Is This Important? Industry-funded R&D represents almost two-thirds of total global R&D and is therefore a significant driver of innovation.[21] Furthermore, business R&D is more geographically mobile than government-funded R&D. As some governments have limited the growth of their R&D budgets, business R&D has grown faster as a percentage of total R&D despite already being more than twice as large as government R&D in 2009.

Europe vs. the United States: The United States significantly outperforms Europe in corporate R&D, with the EU-15 at 55 percent of U.S. levels and the EU-10 at just 20 percent. However, Finland and Sweden exceed the United States by over 20 percent, in part due to the fact that several large R&D-intensive corporations (e.g., Erickson, Volvo, and SAAB) are headquartered in Sweden and Nokia is in Finland. In addition, Finland's TEKES and Sweden's Vinnova, the nations' technology support agencies, have aggressively expanded public-private partnerships. But, with the exception of Germany and Denmark, which are about at the same level as the United States, other EU-15 nations lag significantly behind. For example, the United Kingdom, the Netherlands, and Ireland are all below 50 percent of U.S. levels.

Not only does the United States lead Europe in overall business R&D intensity, its lead has grown since 1999. While the United States grew by 4 percent over the last decade, the EU-15 actually declined by 3 percent. And Europe as a whole grew by just 2 percent, due to a 13 percent increase within the EU-10. But some individual EU nations are growing at a rapid pace. In particular, business R&D in Spain increased by 32 percent, perhaps due to the fact that it now has one of the most generous R&D tax credits in the world.[22] In contrast, in 2008, the U.S. rank in R&D tax generosity was just seventeenth of thirty OECD nations.[23] In the last several years (2006 to 2008), while several European countries did outpace the United States in terms of growth, the United States grew 14 percentage points faster than the EU-15 (10 percent compared to negative 4 percent). Denmark, Italy and Greece all grew by more than 15 percent compared to 10 percent in the United States. However, the recent financial crisis has likely tempered these growth rates, particularly in Greece. When taking U.S. states into consideration, several outperform all nations studied. Massachusetts has more than twice as much business R&D per GSP than Japan, with Connecticut, Michigan, and Washington all having more than 150 percent as much business R&D as Japan.

Europe and the United States vs. the Rest of the World: Neither the United States nor the EU-15 lead in corporate R&D. The distinction belongs to Japan. Japan and South Korea are 47 percent and 20 percent ahead of the United States, respectively, and 161 percent and 115 percent ahead of the EU-15, respectively. And remarkably, given its level of development, China's business R&D intensity now surpasses EU-15 levels (but by just less than a percentage point). Much of this growth is from multinational companies establishing R&D facilities in China, in part stimulated by generous incentives as well as policies tying market access to the establishment of R&D activities in China.[24] However, most developing nations, including Argentina, Chile, Turkey, Brazil, Russia, Mexico, and India, are all below even EU-10 levels.

In part because they are starting from lower levels, but also reflecting the fact that they are focused on becoming more R&D intensive, Chile and China increased their R&D intensity from 1999 to 2008 at a rapid rate, 256 percent and 179 percent respectively. Indeed in 2010 China overtook Japan for the largest amount of R&D investments in the world, behind the United States. But a number of nations that were already highly R&D-intensive grew at robust rates, including South Korea, Australia, and Singapore (all nations with more generous R&D tax credits than the United States). In contrast, the EU-15 actually declined. According to Battelle's annual *2010 Global R&D Funding Forecast*, "BRIC [nations] will dominate future R&D growth, overwhelming Europe and Japan and, eventually, matching the investments in the United States."[25] Since 2006, the developing countries India and Turkey have both grown by over 20 percent, while other developing countries including Russia, South Africa and Argentina actually declined. Because GDP is used as the denominator, some of this decline can be attributed to these countries' economies growing at a faster rate than corporate R&D.

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Business Investment in R&D (continued)

Investments in research and development by business as a percentage of GDP

Rank	Country	Score	Rank	Country	Percent Change 1999-2008
1	Japan	2.73%	1	Chile	256%
2	Finland	2.31%	2	China	179%
3	S. Korea	2.25%	3	Estonia	157%
4	Sweden	2.20%	4	Latvia	106%
5	**U.S.**	**1.86%**	5	Cyprus	70%
6	Germany	1.67%	6	Mexico	68%
7	Denmark	1.66%	7	Austria	60%
8	NAFTA	1.41%	8	Australia	57%
9	Singapore	1.39%	9	Turkey	53%
10	Austria	1.24%	10	Hungary	53%
11	Belgium	1.13%	11	Greece	46%
12	Australia	1.06%	12	S. Korea	43%
13	China	1.05%	13	Singapore	36%
14	Slovenia	1.04%	14	Spain	32%
15	**EU-15**	**1.04%**	15	Slovenia	30%
16	France	1.02%	16	Denmark	29%
17	**EU-25**	**0.98%**	17	Czech Rep.	28%
18	UK	0.89%	18	Japan	25%
19	Canada	0.88%	19	Malaysia	23%
20	Netherlands	0.87%	20	NAFTA	17%
21	Czech Rep.	0.77%	21	India	14%
22	Ireland	0.66%	**22**	**EU-10**	**13%**
23	Portugal	0.56%	23	Brazil	13%
24	Spain	0.56%	24	Finland	9%
25	Italy	0.49%	25	Canada	9%
26	Estonia	0.44%	26	Germany	7%
27	Brazil	0.42%	**27**	**U.S.**	**4%**
28	Malaysia	0.42%	**28**	**EU-25**	**2%**
29	Hungary	0.40%	29	Argentina	0%
30	**EU-10**	**0.37%**	30	UK	-2%
31	South Africa	0.32%	31	Italy	-3%
32	Turkey	0.31%	**32**	**EU-15**	**-3%**
33	Chile	0.31%	33	Sweden	-10%
34	Russia	0.30%	34	Netherlands	-11%
35	India	0.20%	35	Belgium	-12%
36	Poland	0.18%	36	France	-13%
37	Greece	0.18%	37	Ireland	-13%
38	Lithuania	0.17%	38	Poland	-30%
39	Mexico	0.17%	39	Russia	-42%
40	Latvia	0.17%	40	Slovakia	-50%
41	Slovakia	0.16%		Indonesia	N/A
42	Argentina	0.12%		Portugal	N/A
43	Cyprus	0.07%		South Africa	N/A
	Indonesia	N/A		Lithuania	N/A
Average		**0.91%**	**Average**		**32%**

Source: UNESCO, Institute of Statistics, 1999-2008 data.

Government Investment in R&D

Investments in R&D by government as a share of GDP

Why Is This Important? Whereas most R&D investment is made by industry, government-supported R&D has been a key factor in growth and innovation, an investment that spurs greater industry investment R&D.[26] Also, governments are better able to support earlier stage research that is higher risk and farther from commercialization than is the private sector. While much of this research does not lead to commercial results in the short run, it often leads to important innovations. For example, one of the most potentially important future technologies is nanotechnology. Although nanotechnology may very well be to the twenty-first century what steel was to the early twentieth century, commercialization of this new technology is limited. As a result, governments fund the majority of nanotechnology research. Not only does the amount of government R&D vary amongst countries, the mix between corporate and government R&D varies as well. For example, in Italy 51 percent of total R&D is performed by the government (the only EU-15 country with over 50 percent of R&D being funded by the government) while in South Korea only 23 percent is performed by the government.

Europe vs. the United States: Notwithstanding the EU's commitment to the Lisbon Agenda, the United States still leads Europe in government R&D investment. EU-15 levels are 83 percent of U.S. levels and EU-10 levels are 55 percent of U.S. levels. Austria and Finland however, are leaders with investments 32 percent and 9 percent higher than the United States', respectively. However, while France and Sweden, are close to U.S. levels, other European countries are below the United States.

While the United States leads, its lead over EU nations is shrinking. Government R&D investments increased in the EU-15 by 5 percent between 1999 and 2008 while in the United States investment levels actually declined slightly (by less than 1 percent). Moreover, some EU-15 nations made dramatic increases, including Ireland and Spain, where investments went up 67 percent and 53 percent, respectfully. EU-10 R&D investment also grew faster than in the United States but slower than in the EU-15. However, since 2006 several EU-10 countries have made significant increases in R&D investment: both Estonia and Poland have grown by more than 10 percent. Sweden and Denmark have also grown much faster than the United States, by 9 and 6 percent, respectively, while the United States has declined by 2 percent.

Europe and the United States vs. the Rest of the World: The United States ranks eighth and the EU-15 fourteenth in investments in R&D. Singapore and Australia lead both the United States and the EU-15, and Korea is on par with the United States. Japan's levels are 73 percent of U.S. levels and 88 percent of EU-15 levels. In spite of Ireland's economic progress through 2008, it is actually very far behind in government R&D, only barely ahead of South Africa, and the EU-10. Latin American nations—Chile, Argentina, Mexico and Brazil—invest very little in R&D.

However, both the United States and the EU are slipping behind many nations. In part reflecting its strong commitment to boost government R&D, Korea increased investment 35 percent between 1999 and 2009 as a share of GDP. Brazil, Turkey and Russia saw sizable increases (52 percent, 35 percent, and 32 percent, respectively). But many other nations failed to maintain progress, with government R&D as a share of GDP falling by 7 percent in Japan, and 16 percent in India. Several countries however, adapted quickly to the economic crisis in 2008 by increasing their government R&D intensity. For example, Brazil, Chile and South Africa all increased funding by over 10 percent. Other countries, however, such as Singapore, Argentina, India and China actually reduced government funding to R&D as a percent of GDP, in part, at least in the case of India and China, because GDP grew so rapidly.

Rank	Country	Score	Rank	Country	Percent Change 1999-2008
1	Austria	0.99%	1	Cyprus	70%
2	Finland	0.82%	2	Ireland	67%
3	Singapore	0.81%	3	Spain	53%
4	Australia	0.80%	4	Brazil	52%
5	France	0.80%	5	Latvia	43%
6	Sweden	0.76%	6	Estonia	43%
7	S. Korea	0.76%	7	Lithuania	42%
8	**U.S.**	**0.75%**	8	Austria	36%
9	NAFTA	0.70%	9	Turkey	35%
10	Denmark	0.69%	10	S. Korea	35%
11	Germany	0.68%	11	Russia	32%
12	Russia	0.67%	12	Czech Rep.	25%
13	Estonia	0.65%	13	Australia	16%
14	**EU-15**	**0.62%**	14	Mexico	14%
15	Canada	0.61%	15	Hungary	12%
16	Czech Rep.	0.61%	16	Greece	9%
17	**EU-25**	**0.60%**	17	Canada	8%
18	Netherlands	0.59%	18	Portugal	7%
19	UK	0.55%	**19**	**EU-15**	**5%**
20	Japan	0.55%	**20**	**EU-25**	**4%**
21	Spain	0.54%	**21**	**EU-10**	**3%**
22	Portugal	0.53%	22	UK	2%
23	Slovenia	0.52%	23	Denmark	1%
24	Italy	0.51%	24	Singapore	1%
25	Brazil	0.50%	25	Slovenia	0%
26	India	0.45%	26	France	0%
27	Lithuania	0.44%	27	China	-1%
28	Ireland	0.43%	**28**	**U.S.**	**-1%**
29	**EU-10**	**0.41%**	29	NAFTA	-2%
30	Hungary	0.41%	30	Japan	-7%
31	Belgium	0.41%	31	Poland	-10%
32	South Africa	0.38%	32	Belgium	-10%
33	Malaysia	0.37%	33	Finland	-11%
34	Poland	0.36%	34	Germany	-11%
35	Turkey	0.30%	35	Argentina	-12%
36	Chile	0.30%	36	Sweden	-14%
37	Mexico	0.30%	37	Netherlands	-16%
38	China	0.29%	38	India	-16%
39	Latvia	0.29%	39	Chile	-19%
40	Greece	0.28%	40	Slovakia	-21%
41	Argentina	0.27%	41	Indonesia	-35%
42	Cyprus	0.27%		South Africa	N/A
43	Slovakia	0.25%		Italy	N/A
44	Indonesia	0.04%		Malaysia	N/A
Average		**0.52%**	**Average**		**16%**

Source: UNESCO, Institute of Statistics, 1999-2008 data.

Number and Quality of Academic Publications

Academic publications per million people and the relative prominence of those publications[27]

Why Is This Important? Academic publications are traditionally viewed as a measurement of the productivity of university and national institutions. However, publications are also a good measure of the overall research community; for example, countries that have significant publication rates tend to also have higher than average national R&D expenditures.

Europe vs. the United States: The United States was once the unparalleled global leader in academic publications, however within the last two decades academic research has become much less Anglo-centric. The EU-15 now just slightly leads the United States in a composite score of the number of publications per capita and the quality of those publications. The EU-15 leads the United States by 0.1 standard deviations, but the United States is above EU-10 by 2.3 standard deviations. Northern European nations, specifically Denmark, Sweden and the Netherlands (taking the top three positions), outperform the United States, largely because they publish many more articles (per population) with a higher number of citations.

Moreover, over the last 15 years the EU-15 has out-accelerated the United States in the number of scientific articles. In fact, the United States ranks last of the forty-four countries and regions where data are available. Some argue that the decline in U.S. leadership in academic publications is simply due to the large share of the world's publications the U.S. had in 1999. However the score does not consider the percent of global publications, only the share of a country's publications compared to its population. In this regard, every country has made more progress than the United States. And some have done so by significant margins. The EU-15 has grown 2 standard deviations faster than the United States, and the EU-10 has grown by 2.4 standard deviations.

Europe and the United States vs. the Rest of the World: Europe and the United States dominate academic publications accounting for twenty-two of the top twenty-five nations, behind only Australia, Canada and Singapore. In terms of change, however, Asia is making rapid strides, with research articles increasing in Singapore and South Korea by 4.2 and 2.8 standard deviations over the United States respectively. Part of this change in Asia reflects increased scientific research capabilities, but some of it may reflect an increased interest in and ability to publish in international journals, most of which are English. South Africa has also shown rapid progress, in part because of its low base but also because of increased funding to universities. Finally, while some developing nations, such as Turkey and Argentina, have made significant progress, others, including Malaysia and Brazil, have experienced decline. In terms of the rate of change from 2005 to 2009 the United States is third to last with Brazil and Chile making up the remaining bottom two spots. Amongst non-European countries, Singapore, Australia and Malaysia have made the most progress over the last five years, all growing by over 0.1 standard deviation.

Rank	Country	Score	Rank	Country	Absolute Change 1996-2009
1	Denmark	8.9	1	Singapore	2.08
2	Sweden	8.5	2	Slovenia	1.31
3	Netherlands	8.5	3	Portugal	1.08
4	Finland	7.6	4	Ireland	0.91
5	Belgium	7.5	5	Estonia	0.84
6	UK	7.2	6	Czech Rep.	0.81
7	Australia	7.2	7	Greece	0.78
8	Canada	7.1	8	S. Korea	0.74
9	Singapore	7.0	9	Belgium	0.40
10	Ireland	6.8	10	South Africa	0.39
11	Austria	6.8	11	Spain	0.33
12	**EU-15**	**6.3**	**12**	**EU-10**	**0.30**
13	Germany	6.3	13	Hungary	0.27
14	**U.S.**	**6.2**	14	Denmark	0.27
15	**EU-25**	**6.0**	15	Lithuania	0.26
16	France	5.8	16	China	0.23
17	Italy	5.6	17	Netherlands	0.18
18	Estonia	5.5	18	Italy	0.16
19	NAFTA	5.5	19	Poland	0.15
20	Spain	5.4	20	Turkey	0.13
21	Slovenia	5.3	21	Argentina	0.11
22	Greece	5.1	22	Austria	0.08
23	Portugal	5.0	**23**	**EU-25**	**-0.01**
24	Czech Rep.	4.6	24	Australia	-0.05
25	Hungary	4.5	25	Slovakia	-0.07
26	Japan	4.3	26	Germany	-0.08
27	Cyprus	4.3	27	India	-0.09
28	S. Korea	4.2	**28**	**EU-15**	**-0.10**
29	**EU-10**	**3.9**	29	Latvia	-0.25
30	South Africa	3.8	30	Chile	-0.29
31	Chile	3.5	31	Indonesia	-0.37
32	Argentina	3.5	32	Mexico	-0.37
33	Poland	3.5	33	Russia	-0.41
34	Slovakia	3.4	34	Finland	-0.45
35	Lithuania	3.4	35	Malaysia	-0.46
36	Indonesia	3.2	36	UK	-0.61
37	Mexico	2.9	37	France	-0.61
38	Turkey	2.8	38	Cyprus	-0.62
39	Latvia	2.7	39	Brazil	-0.69
40	Brazil	2.7	40	Japan	-0.73
41	India	2.4	41	Sweden	-0.82
42	Malaysia	2.4	42	Canada	-0.97
43	China	2.3	43	NAFTA	-1.61
44	Russia	2.1	**44**	**U.S.**	**-2.09**
Average		**5.0**	**Average**		**-0.04**

Source: SCImago Journal & Country Rank and OECD, 1996-2009 data.[28]

Venture Capital[29]

Venture capital investment as a percentage of GDP

Why Is This Important? Venture capital is an important source of financing for young and growing companies, many of which are too new to raise capital in public markets and too underdeveloped to secure bank loans, yet have extremely high growth potential. Venture capital also creates high-quality jobs. Indeed, 12.1 million jobs exist in U.S. venture capital-backed companies.[30] Although total U.S. venture capital is down from the late 1990s, it still exceeds the level of U.S. venture capital in the mid-1990s. Moreover, venture capital, like many industries, is becoming more global. In 2010, Deloitte found that 90 percent of U.S.-based venture capitalists anticipate decreasing investments in the United States and increasing investments in China, Brazil and India by 2015.[31]

Europe vs. the United States: While the United States traditionally has had more venture capital under management and invested than Europe, in 2009 the EU-15 saw 2 percent more venture capital investments as a percent of GDP than the United States. Much of this lead is because of significant growth in recent years within Finland, Sweden and the United Kingdom, which now lead Europe and have more than 60 percent higher venture capital rates of investment than the United States. But other nations such as Spain and Ireland that have been more dependent on branch plants for prosperity, or Germany, that is more dependent on large firms and innovations within existing firms, invest less. Taking U.S. states into consideration, both Massachusetts and California lead the world. California's lead is particularly noteworthy in that the Californian economy is ten times as large as Singapore's, the leading nation. Several states (Alaska, Arkansas, Mississippi, and Nebraska) actually make up the bottom four places, having had no venture capital in 2008.

The rapid decline in venture capital in the United States helps illustrate why Europe has been able to overtake the United States. While venture funds invested fell by 67 percent in the United States between 2000 and 2009, they remained level in the EU-15 and increased in Denmark, Ireland and Finland by 25 percent. In fact, the United States trailed every EU-15 nation in rate of growth of venture funds, short of Greece. However, the recession clearly impacted venture capital funding in many European countries. In the United States, United Kingdom, Austria and Denmark venture capital declined by over one-third between 2005 and 2009. However other nations, such as France, Germany, and Spain, have been able to weather the storm much more successfully, growing venture capital investment by over 50 percent.

Europe and the United States vs. the Rest of the World: Singapore leads the world in venture capital, seeing nearly twice as much investment as a share of GDP than the United States. Australia also has ten percent more venture capital per GDP than United States. But India, China, Russia and Chile, largely dependent upon multinational branch plants, enjoy almost no venture capital investment.

While data on change in venture investing are limited, Japan outperformed all EU nations and the United States in venture fund growth, perhaps because it was starting from a much smaller base. Canada in contrast, however, saw steep declines in venture investing. After nearly a decade of growth, South Korea has seen a sizeable decline in venture capital over the last few years, losing nearly three quarters of funding since 2005, behind only Portugal.

Rank	Country	Score	Rank	Country	Percent Change 1999-2008
1	Singapore	0.24%	1	Japan	169.2%
2	Finland	0.24%	2	Czech Rep.	115.0%
3	Sweden	0.21%	3	Hungary	33.5%
4	UK	0.20%	4	Denmark	27.4%
5	Denmark	0.16%	5	Ireland	25.8%
6	Australia	0.13%	6	Finland	24.6%
7	Ireland	0.13%	7	France	8.2%
8	France	0.13%	8	Australia	6.1%
9	Spain	0.13%	**9**	**EU-10**	**6.0%**
10	**EU-15**	**0.13%**	**10**	**EU-25**	**5.0%**
11	**U.S.**	**0.12%**	11	Spain	2.0%
12	Czech Rep.	0.12%	**12**	**EU-15**	**-0.3%**
13	**EU-25**	**0.12%**	13	Belgium	-5.7%
14	NAFTA	0.11%	14	UK	-7.5%
15	Brazil	0.11%	15	Sweden	-11.2%
16	Netherlands	0.10%	16	Germany	-12.7%
17	Belgium	0.10%	17	Netherlands	-49.2%
18	Germany	0.09%	18	Italy	-50.0%
19	Canada	0.08%	19	Austria	-52.0%
20	S. Korea	0.07%	20	Portugal	-57.5%
21	Japan	0.07%	21	Poland	-58.9%
22	**EU-10**	**0.05%**	22	NAFTA	-60.2%
23	Hungary	0.05%	**23**	**U.S.**	**-67.5%**
24	Italy	0.04%	24	Canada	-73.2%
25	Mexico	0.04%	25	Greece	-77.9%
26	Portugal	0.03%		India	N/A
27	Austria	0.03%		S. Korea	N/A
28	Poland	0.02%		Slovenia	N/A
29	Greece	0.01%		Singapore	N/A
30	India	0.01%		Brazil	N/A
31	China	0.00%		Slovakia	N/A
32	Chile	0.00%		Lithuania	N/A
33	Russia	0.00%		Estonia	N/A
	Malaysia	N/A		Indonesia	N/A
	Argentina	N/A		Mexico	N/A
	Indonesia	N/A		Malaysia	N/A
	Estonia	N/A		Chile	N/A
	Slovenia	N/A		Turkey	N/A
	South Africa	N/A		Argentina	N/A
	Turkey	N/A		Latvia	N/A
	Slovakia	N/A		South Africa	N/A
	Latvia	N/A		Russia	N/A
	Cyprus	N/A		China	N/A
	Lithuania	N/A		Cyprus	N/A
Average		**0.09%**	**Average**		**-6.4%**

Source: OECD, 1999-2008 data.

New Firms

The number of new firms per 1,000 employed workers.[32]

Why Is This Important? Entrepreneurship has long been hailed as a benchmark of economic dynamism. New firms can introduce new business models and innovative practices and be an important component of job growth. The level of entrepreneurial activity within a country results from a variety of structural factors, such as the level of human capital, the regulatory environment, the degree to which capital is available, and the overall attitude toward risk. Although the factors determining a country's entrepreneurship rate vary by nation, one thing is certain: in a globalized economy where large, international multi-establishment firms can move around the globe, homegrown entrepreneurs can play an important role in economic growth. And the structural components of an entrepreneurial economy are far from trivial. For example, the World Bank has found that countries with high levels of regulation artificially raise barriers to entry that decrease entrepreneurship.[33]

Europe vs. the United States: Consistent with its long-standing entrepreneurial culture, the United States leads the EU-15 with about 30 percent more new firm formation, and the EU-10 with about two-thirds more. But the United Kingdom now outperforms the United States, with nearly twice as many new firms relative to the size of its labor force. Several EU-10 countries have also surpassed the United States. Estonia, Hungary and Latvia have 88 percent, 46 percent and 7 percent more new firm formation, respectively.

In terms of growth in entrepreneurship from 2005 to 2009, however, the EU-15 and EU-10 saw growth rates 6 percent and 56 percentage points faster, respectively than in the United States. In fact, only Denmark, Ireland and Spain saw slower rates of growth in entrepreneurship.

Europe and the United States vs. the Rest of the World: Singapore and Australia lead the United States and the EU in entrepreneurship. But many countries fall behind the United States and EU, such as Brazil and Russia, in part because much entrepreneurship exists in the informal economy, and, as such, is not measured. Other countries fall behind because the culture of entrepreneurship is poorly developed. For example, Japan, with its focus on large organizations and lifetime employment, has only about one-quarter of the U.S. rate of new firm formation. Latin American nations also generally have low levels of entrepreneurship, with Brazil, Chile, Mexico, and Argentina having rates 55 percent, 49 percent, 14 percent, and 10 percent of the United States, respectively.

In terms of change, however, America's position is slipping. Most other nations saw faster growth. New firm formation rates more than doubled in the last decade in India and increased 85 percent in S. Korea. In Brazil, entrepreneurship grew 35 percentage points faster than in the United States. Even Japan grew faster, albeit, only slightly, than the United States. Turkey, Argentina, South Africa and Russia have grown more slowly than the United States.

Rank	Country	Score	Rank	Country	Percent Change 2005-2009
1	Estonia	8.10	1	India	110.1%
2	UK	8.05	2	Hungary	94.6%
3	Canada	7.56	3	S. Korea	85.5%
4	Singapore	7.40	4	Greece	62.5%
5	Australia	6.38	5	Slovenia	60.6%
6	Hungary	6.26	6	Czech Rep.	55.1%
7	Ireland	4.67	**7**	**EU-10**	**42.8%**
8	NAFTA	4.67	8	Finland	30.0%
9	Latvia	4.62	9	Singapore	27.5%
10	Denmark	4.57	10	Brazil	22.8%
11	**U.S.**	**4.30**	11	Slovakia	22.5%
12	Belgium	4.28	12	Lithuania	19.5%
13	Slovenia	4.16	13	Netherlands	18.4%
14	Sweden	4.09	14	Estonia	18.2%
15	Slovakia	4.04	15	Sweden	17.1%
16	Portugal	3.92	16	Indonesia	17.0%
17	Finland	3.37	17	Belgium	14.4%
18	**EU-15**	**3.32**	18	Mexico	10.4%
19	**EU-25**	**3.25**	19	Poland	9.4%
20	Netherlands	3.10	20	France	7.6%
21	France	3.08	21	Portugal	6.6%
22	Czech Rep.	3.00	22	Canada	5.0%
23	Spain	2.92	23	Malaysia	1.0%
24	Russia	2.61	24	Chile	-0.4%
25	**EU-10**	**2.58**	25	Australia	-0.8%
26	Malaysia	2.55	26	Germany	-1.8%
27	Brazil	2.38	27	UK	-3.1%
28	Lithuania	2.18	28	Japan	-3.5%
29	Chile	2.12	**29**	**EU-25**	**-3.8%**
30	Italy	1.78	**30**	**EU-15**	**-6.0%**
31	S. Korea	1.72	31	Italy	-6.4%
32	Japan	1.28	32	NAFTA	-9.8%
33	Germany	1.19	33	Austria	-9.9%
34	Greece	1.18	**34**	**U.S.**	**-12.0%**
35	Turkey	0.87	35	Turkey	-12.6%
36	South Africa	0.77	36	Argentina	-16.0%
37	Mexico	0.61	37	Latvia	-16.8%
38	Austria	0.58	38	Denmark	-22.2%
39	Poland	0.52	39	Ireland	-26.4%
40	Argentina	0.46	40	Spain	-42.1%
41	Indonesia	0.18	41	South Africa	-47.2%
42	India	0.12	42	Russia	-47.2%
	Cyprus	N/A		China	N/A
	China	N/A		Cyprus	N/A
Average		**3.20**	**Average**		**11.4%**

Source: World Bank, 2005-2009 data.

E-Government[34]

A measure of the utilization of digital technology in national government

Why Is This Important? In the past, governments have been judged based on their degree of efficiency, transparency and robustness of services offered. Today, IT is creating the opportunity for governments to take these benchmarks to a new level and establish an even greater and more effective link between citizens and businesses. Today governments with sophisticated e-government networks can provide traditional services such as license plate renewal or business permits in a fraction of the time of physical government offices and at a much lower cost. Yet e-government does not just boost government efficiency, digitalization has transformed the way governments function. By making government services available in a "one-stop-digital-shop," interagency cross-coordination has become essential.[35] This "whole-of-government" approach can provide citizens and businesses a faster, more user-friendly interface than the departmentalization associated with traditional brick and mortar bureaucracies.

Europe vs. the United States: The United States leads Europe in e-government, outscoring the EU-15 by 58 percent and the EU-10 by almost 126 percent. In fact the United States exceeds all European countries.

When it comes to progress, the United States ranks behind most EU-15 countries, having dropped from first in the world in 2003 to second in 2010. While both the EU-15 and U.S. scores declined, the former's declined by about half as much as the United States. Some European nations in particular showed significant progress, including Spain (79 percent), Greece (74 percent) and France (16 percent). Since 2008, however, the United States maintained its score, with the United Kingdom and Spain increasing their scores by 12 percent and 9 percent, respectively. Between 2008 and 2010, Denmark's and Sweden's scores have dropped by over one-third, in part because they were world leaders in 2008 and other countries have caught up.

Europe and the United States vs. the Rest of the World: The EU and the United States have led the world in e-government, but within the last year South Korea has taken over as the number one country. Canada, Australia, Singapore and Japan also rank within the top ten countries. These nations, having developed national e-government strategies, rank higher than the EU-15 and EU-10. In contrast, the BRICs (Brazil, Russia, India, and China) and the other developing countries score low, in part because e-government success is moderately correlated with per capita income levels.

What is most startling for many developing countries is not that they rank high in terms of e-government but that their rankings have declined in relative scores since 2003. India, Mexico, Argentina, Brazil, Indonesia and South Africa have all seen their scores decline by over one-third in the last decade. Asia is advancing e-government faster than the United States. South Korea, Japan, Malaysia and China have all shown faster progress than the United States both between 2003 and 2010 and between 2008 and 2010.

Rank	Country	Score	Rank	Country	Percent Change 2003-2010
1	S. Korea	1.000	1	Spain	79%
2	**U.S.**	**0.937**	2	Greece	74%
3	Canada	0.883	3	S. Korea	65%
4	NAFTA	0.814	4	Hungary	62%
5	UK	0.775	5	Latvia	56%
6	Spain	0.765	6	Russia	48%
7	Australia	0.765	7	Czech Rep.	30%
8	Singapore	0.686	8	Japan	28%
9	France	0.683	9	Netherlands	26%
10	Netherlands	0.680	10	Belgium	23%
11	Japan	0.673	11	France	20%
12	Denmark	0.673	12	Malaysia	17%
13	Malaysia	0.632	13	Canada	16%
14	Belgium	0.625	14	China	11%
15	Chile	0.610	15	Austria	0%
16	**EU-15**	**0.593**	16	UK	0%
17	Greece	0.571	17	Singapore	-2%
18	Cyprus	0.570	**18**	**EU-15**	**-3%**
19	**EU-25**	**0.567**	19	Denmark	-3%
20	Germany	0.549	**20**	**EU-25**	**-3%**
21	Sweden	0.527	21	Australia	-6%
22	Hungary	0.505	**22**	**U.S.**	**-6%**
23	Estonia	0.502	23	Lithuania	-8%
24	Ireland	0.498	24	Slovakia	-9%
25	Lithuania	0.483	25	Slovenia	-9%
26	Finland	0.479	**26**	**EU-10**	**-11%**
27	Austria	0.476	27	NAFTA	-13%
28	Czech Rep.	0.454	28	Ireland	-19%
29	Mexico	0.441	29	Germany	-20%
30	Latvia	0.416	30	Finland	-21%
31	**EU-10**	**0.414**	31	Estonia	-22%
32	Argentina	0.413	32	Sweden	-23%
33	Slovenia	0.400	33	Portugal	-24%
34	Portugal	0.387	34	Chile	-27%
35	Poland	0.387	35	Poland	-28%
36	China	0.368	36	India	-30%
37	India	0.368	37	Mexico	-33%
38	Brazil	0.368	38	Argentina	-34%
39	Slovakia	0.346	39	Brazil	-36%
40	Turkey	0.346	40	Indonesia	-44%
41	Russia	0.330	41	South Africa	-45%
42	South Africa	0.308	42	Turkey	-45%
43	Italy	0.289	43	Italy	-53%
44	Indonesia	0.244		Cyprus	N/A
Average		**0.542**	**Average**		**9%**

Source: United Nations, 2003-2010 data.

Broadband Telecommunications

Broadband quality and subscription rates per capita[36]

Why Is This Important? A country's broadband penetration rate not only indicates the degree to which a nation's citizens and business can access high speed Internet, it is a proxy for digital transformation. From faster download times that make businesses more efficient to the expansion of online services, broadband enables digital progress. Indeed because of this several countries have made increasing broadband coverage and take up a key part of their economic recovery packages.[37] Moreover, the quality of global broadband has increased by 50 percent in the last three years.[38]

Europe vs. the United States: Somewhat surprisingly given the fact that the United States ranks in the middle of the pack in broadband among OECD nations, it actually leads the EU-15 in broadband adoption and quality, albeit by a small degree.[39] However, this ranking masks considerable differences within the EU-15, with the Nordic nations significantly ahead of the United States and even farther ahead of the rest of the EU-15. The EU-10 is significantly behind the EU-15 and the United States, scoring about 75 percent the U.S. level.

With regard to the growth rate of broadband adoption, the EU-15 has progressed five percentage points faster than United States, in large part though because the United States was even further ahead in 2002.[40] If the United States had the same level of adoption as the EU-15 in 2002 and it grew to the same level as it did, it would have made slightly faster progress than the EU-15. The EU-10 grew much slower than the EU-15 or the United States because broadband was virtually non-existent in 2002 and because EU-10 still has a long way to go to reach U.S. levels.

Since 2007, the EU-10 grew one and three percentage points faster than the EU-15 and United States, respectively. In terms of quality, the United States has increased slightly faster than the EU-15. However some countries such as the Netherlands and Sweden have increased broadband quality at a much faster rate. Broadband is the only indicator for which no U.S. state is ahead of the world leaders. Denmark, the Netherlands and South Korea outrank New Jersey and Hawaii, the top ranked states, for broadband penetration.

Europe and the United States vs. the Rest of the World: The EU-15 and the United States rank behind South Korea and Japan in broadband, with these nations scoring 81 percent and 39 percent higher, respectively than the United States. South Korea and Japan ranked first and second, respectfully, partially because of their large urban populations living in dense cities where it is cheaper to connect multiple users to fiber optic cable. That being said, it would be too deterministic to claim that South Korea and Japan's leadership is simply a product of geographic coincidence. Both countries have had sophisticated broadband supply and demand strategies.[41] Given its relatively high per capita income and dense population, Singapore performs relatively poorly on broadband. And lower income nations like the BRICs (Brazil, Russia, India, and China) and Latin American countries score quite low, in large part because broadband adoption is significantly influenced by levels of per-capita income.

South Korea and Japan made faster progress than the EU and the United States, in part because all these nations put in place aggressive national broadband policies in this decade, including significant financial incentives for broadband providers to deploy more extensive and faster networks. Since 2007, Europe dominates growth (particularly Eastern Europe) with Singapore, Mexico and South Korea being the only non-European countries to be in the top 20 countries.

Rank	Country	Score	Rank	Country	Absolute Change 2002-2009
1	S. Korea	10.6	1	Denmark	29.5%
2	Japan	8.1	2	France	28.9%
3	Sweden	7.5	3	Netherlands	28.3%
4	Netherlands	7.5	4	UK	27.3%
5	Denmark	7.2	5	S. Korea	26.6%
6	Finland	6.9	6	Germany	26.5%
7	Latvia	6.6	7	Canada	26.0%
8	Germany	6.5	8	Japan	24.3%
9	France	6.4	**9**	**EU-15**	**24.0%**
10	Belgium	6.1	10	Finland	23.6%
11	**U.S.**	**5.9**	11	Australia	23.1%
12	Lithuania	5.8	12	Singapore	23.0%
13	**EU-15**	**5.8**	**13**	**EU-25**	**22.6%**
14	Canada	5.7	14	Sweden	22.4%
15	UK	5.7	15	Belgium	21.6%
16	**EU-25**	**5.6**	16	Ireland	21.4%
17	Estonia	5.3	17	Slovenia	20.8%
18	Singapore	5.2	18	Cyprus	19.5%
19	NAFTA	5.2	19	Estonia	19.1%
20	Slovenia	5.1	20	Italy	19.1%
21	Portugal	5.1	**21**	**U.S.**	**18.9%**
22	Hungary	5.1	22	Lithuania	18.7%
23	Austria	5.0	23	Spain	18.6%
24	Australia	4.9	24	Latvia	18.2%
25	Spain	4.8	25	Hungary	17.7%
26	Ireland	4.7	26	Greece	17.2%
27	Slovakia	4.5	27	NAFTA	17.0%
28	Czech Rep.	4.5	28	Austria	16.5%
29	**EU-10**	**4.5**	29	Portugal	14.9%
30	Greece	4.5	**30**	**EU-10**	**14.4%**
31	Italy	4.4	31	Slovakia	14.3%
32	Cyprus	4.2	32	Czech Rep.	13.1%
33	Poland	4.1	33	Poland	12.6%
34	Russia	3.7	34	Argentina	10.2%
35	Chile	3.3	35	Mexico	8.6%
36	Turkey	3.3	36	Turkey	8.5%
37	Argentina	3.1	37	Chile	8.4%
38	Mexico	2.9	38	China	7.5%
39	Malaysia	2.9	39	Malaysia	6.0%
40	China	2.9	40	Brazil	5.5%
41	Brazil	2.7	41	South Africa	1.0%
42	South Africa	2.1	42	Indonesia	0.7%
43	India	2.0	43	India	0.6%
44	Indonesia	2.0		Russia	N/A
Average		**5.0**	**Average**		**19.1%**

Source: International Telecommunications Union, and Said Business School, 2002-2009 data.

Corporate Investment in Information Technology

Business investments in IT as a share of GDP

Why Is This Important? Information technology (IT) investment is the principal driver of productivity growth in most nations. Nations with higher rates of IT investments in the 1990s all saw increases in national productivity, whereas countries where investments in IT fell or only grew marginally saw no productivity acceleration.[42] Moreover, in countries like the United States, France, Germany, Italy, and the United Kingdom, increased investment in IT was responsible for virtually all increases in productivity in the 1990s.[43] IT also spurs growth and increased quality of life in developing nations.[44] Indeed one study of 131 developing countries found a 1 percent increase in IT usage contributed to an approximately 0.1 percentage point increase of annual GDP growth rate in the selected countries.[45] Indeed, despite the economic recession global investments in IT were 13 percent higher in 2010 than in 2007 and are expected to grow another 25 percent by 2013.[46]

Europe vs. the United States: The United States invests 29 percent more in IT as a share of GDP than does the EU-15, which accounts for a considerable share of the increased rate of productivity growth in the United States than in Europe.[47] However, some European nations, such as the United Kingdom and Finland, come close to U.S. investment rates. In contrast, France, Demark and Spain lag behind. Germany invests roughly three-quarters as much as the United States, which some might see as surprising given its strong technology base. Within Europe, Italy ranks lowest at 63 percent U.S. levels.

Between 2003 and 2010, both the EU-15 and the United States saw declines in IT investments as a share of GDP, with the EU-15 declining twice as much as the United States. However much of the decline can be attributed to the economic recession where investments declined across all sectors. But from 2007 to 2010, EU-10 countries made significantly faster progress than the United States, accounting for six of the top ten countries in terms of progress.

Europe and the United States vs. the Rest of the World: When it comes to IT investment, the United States and Southeast Asia are in the lead. South Korea and China both invest more than one-third as much as the EU-15.[48] Japan and Singapore, nations with explicit national digital transformation strategies, also invest more than most European nations. Notwithstanding its low levels of income, India ranks moderately high, similar to Austria, reflecting in part the rapid growth of the software and IT services industries. Latin American countries rank near the bottom with much lower levels of investments.

Indonesia and India lead the world in growth rates reflecting both countries' strategies to develop preeminent IT offshoring destinations. Indeed, as India's IT service sector moves up the value chain from support to software development Indonesia has become a lower cost alternative, which is part of the reason Indonesia has led all countries in progress since 2007.

Rank	Country	Score	Rank	Country	Percent Change 2003-2010
1	Czech Rep.	8.29%	1	Indonesia	49.5%
2	Slovakia	7.88%	2	India	42.9%
3	S. Korea	7.70%	3	Slovenia	42.5%
4	China	7.27%	4	Mexico	28.6%
5	**U.S.**	**7.19%**	**5**	**EU-10**	**24.7%**
6	NAFTA	7.16%	6	Finland	21.1%
7	UK	7.08%	7	Argentina	20.1%
8	Hungary	6.97%	8	Slovakia	12.6%
9	Canada	6.89%	9	Chile	12.0%
10	**EU-10**	**6.86%**	10	NAFTA	10.2%
11	Finland	6.74%	11	Canada	5.7%
12	Singapore	6.74%	12	Greece	3.7%
13	Japan	6.41%	13	Czech Rep.	3.6%
14	Portugal	6.21%	14	Portugal	3.5%
15	Netherlands	6.16%	15	Hungary	2.6%
16	Sweden	5.91%	16	Poland	1.2%
17	Poland	5.67%	17	S. Korea	-0.5%
18	**EU-25**	**5.66%**	18	China	-1.6%
19	**EU-15**	**5.54%**	19	Japan	-2.4%
20	Germany	5.53%	20	UK	-3.1%
21	India	5.49%	**21**	**U.S.**	**-5.0%**
22	Austria	5.48%	22	Brazil	-5.5%
23	Brazil	5.45%	23	Netherlands	-6.0%
24	Chile	5.23%	**24**	**EU-25**	**-6.6%**
25	Belgium	5.20%	25	Austria	-7.6%
26	Greece	5.20%	26	Germany	-8.8%
27	Argentina	5.20%	**27**	**EU-15**	**-10.7%**
28	Ireland	5.13%	28	Turkey	-11.4%
29	France	5.07%	29	Belgium	-12.4%
30	Slovenia	4.92%	30	Ireland	-13.2%
31	Mexico	4.90%	31	Russia	-13.4%
32	Denmark	4.84%	32	Sweden	-13.6%
33	Spain	4.79%	33	Singapore	-14.5%
34	Australia	4.71%	34	France	-14.6%
35	Italy	4.57%	35	Malaysia	-15.7%
36	Turkey	4.07%	36	Denmark	-17.5%
37	Russia	4.03%	37	Spain	-20.4%
38	Indonesia	3.70%	38	Italy	-20.6%
	Latvia	N/A	39	Australia	-24.7%
	Lithuania	N/A		South Africa	N/A
	Estonia	N/A		Latvia	N/A
	Cyprus	N/A		Lithuania	N/A
	Malaysia	N/A		Cyprus	N/A
	South Africa	N/A		Estonia	N/A
Average		**5.83%**	**Average**		**1.6%**

Source: The World Information Technology and Services Alliance, 2003-2010 data.

Effective Corporate Tax Rates

Average four-year effective marginal corporate tax rate

Why Is This Important? Higher corporate taxes (from income, sales, property and other taxes) have an adverse effect on foreign direct investment (FDI), and investment rates. The most important component of corporate taxes is not the statutory tax rate (the rate at which companies pay for their income), but the effective corporate tax rate, which takes into account the deductions, exemptions, and credits that companies qualify for.[49] All else equal, higher corporate taxes retard investment. A 10 percent increase in the effective corporate tax rate reduces the aggregate investment-to-GDP ratio by 2.2 percent and reduces FDI inflows by 2.3 percent.[50] Consequently, countries with competitive corporate taxes are more attractive to businesses.[51] Corporate tax policy also presents nations with a particular opportunity for rapid advancement. Unlike many structural factors that affect a country's competitiveness, corporate taxes are not tied to the historical or institutional framework of a nation and can be changed with relative ease.

Europe vs. the United States: When it comes to corporate tax competition, Europe is far more competitive than the United States, with rates in the United States 13 percent higher than Europe as a whole and 60 percent higher than in the EU-10. Most EU-10 nations have made a conscious choice to keep effective corporate tax rates low in order to provide a more attractive location for internationally mobile business investment. Some have done this with generous incentives, including R&D tax credits,[52] while others have lowered statutory rates. However, effective tax rates differ significantly throughout Europe, with Hungary, Spain, and Sweden having relatively low effective rates, and Germany and Italy having higher rates.

Given that government expenditures as a share of GDP are higher in Europe, Europe's lower corporate rates may come as a surprise. However, one reason that Europe is able to afford corporate lower rates, despite having higher government spending, is that it raises a significant share of revenues from border-adjustable value-added taxes. Because these are levied on imports but exempted on exports, the European tax system gives companies located inside Europe's borders a double advantage in international markets—lower corporate rates and value-added taxes levied on imports.

Europe and the United States vs. the Rest of the World: When it comes to corporate tax competitiveness, the EU-10 as a whole is, with the exception of Chile and Singapore, the most competitive of the nations or regions included here. EU-10 includes four of the top six spots. For example, Latvia, Hungary and Slovak Republic all have effective rates below 15 percent. Outside of Europe corporate tax rates are generally higher. In particular Indonesia, Japan and Argentina all have rates ten percent higher than the EU-15.

Rank	Country	Rate
1	Latvia	9%
2	Hungary	14%
3	Slovakia	14%
4	Chile	16%
5	Singapore	16%
6	Slovenia	17%
7	**EU-10**	**17%**
8	Turkey	19%
9	Portugal	19%
10	Netherlands	19%
11	Poland	19%
12	Belgium	20%
13	Austria	20%
14	China	22%
15	Canada	22%
16	Spain	22%
17	Sweden	22%
18	Ireland	22%
19	Malaysia	23%
20	France	23%
21	UK	24%
22	Brazil	24%
23	Finland	24%
24	S. Korea	24%
25	**EU-25**	**24%**
26	Denmark	25%
27	NAFTA	25%
28	India	25%
29	**EU-15**	**25%**
30	Greece	25%
31	Russia	26%
32	South Africa	27%
33	Australia	27%
34	Mexico	27%
35	**U.S.**	**28%**
36	Germany	28%
37	Indonesia	28%
38	Italy	29%
39	Japan	39%
40	Argentina	43%
	Lithuania	N/A
	Estonia	N/A
	Cyprus	N/A
	Czech Rep.	N/A
Average		**23%**

Source: PriceWaterHouseCoopers, 2006-2009 data.[53]

Business Climate

A measurement of the regulatory and business climate

Why Is This Important? Creating a regulatory environment that attracts businesses and cultivates growth is essential to any economy. Governments may not have complete control over where multinational corporations choose to locate or how companies start up or grow, but by reducing bureaucratic red tape, enforcing property rights and the rule of law and decreasing barriers to entry they can create an environment supportive of business growth. The silver lining of the economic recession may be the impact on regulatory reform. In order to make opening and running a business easier, 117 economies implemented regulatory reforms between 2009 and 2010.[54] We rank countries on nine sub-indicators to arrive at an overall indicator for ease of doing business and capture the regulatory framework of each country. The nine sub-indicators are: ease of starting a business, dealing with construction permits, hiring workers, registering property, getting credit, protecting investors, trading across borders, enforcing contracts, and closing a business.

Europe vs. the United States: It is much easier to do business in the United States than it is in Europe. The United States ranks much higher than the EU-15 nations, except for the United Kingdom, particularly Greece, Italy and France, and it ranks higher than all EU-10 nations. The United Kingdom and Ireland lead Europe (although Ireland falls behind the United States) because both countries have streamlined regulatory systems. The United Kingdom is also a global leader in online business processes and innovation within government procurements.

In 2005 the United States led all European nations by substantial margins; however since then the U.S. had declined by 1.5 standard deviations more than the EU-15 and 3 standard deviations more than the EU-10. While it has gotten slightly harder to do business in the United States since 2008, in the EU-15 it has gotten even harder, particularly in Sweden, Poland, and Germany. Within the last seven years, only Germany, Austria and Italy have seen slower progress than the United States. Portugal, the top country in the world for the government's e-business portal has grown nearly 6.14 standard deviations faster than the United States.

Europe and the United States vs. the Rest of the World: Singapore scores significantly better than the Unites States. As a general rule, nations with an Anglo-Saxon legal and cultural tradition (United Kingdom, Singapore, Canada, Australia, the United States, and Ireland) tend to rank highly. Scandinavian nations, with their focus on good government, while not scoring as high as Anglo-Saxon nations, still score moderately high, as reflected by Sweden's score. In contrast, nations with a Latin tradition score much lower, including Chile, Argentina, Spain, Mexico, and France. Communist or former communist or socialist nations also score low. Most EU-10 nations, like Poland, which had a long history under Soviet domination, score quite low, as does Russia. Similarly, China also scores quite low. And, as former socialist nations, so too do India and Indonesia.

Relatively new capitalist countries such as Indonesia, Malaysia and several Eastern European countries have made the most progress, in part because they are starting from such low scores and there is so much "low hanging fruit" to pick to make progress, and in part because governments in these countries are not as burdened by legacy political infighting and therefore more able to adapt government policies to the twenty-first century business climate. But these nations still have a very long way to go before their business climates are fully supportive of growth.

Rank	Country	Score	Rank	Country	Absolute Change* 2005-2010
1	Singapore	13.6	1	China	5.75
2	UK	11.3	2	Indonesia	4.66
3	Australia	10.3	3	Czech Rep.	3.69
4	**U.S.**	**9.4**	4	Latvia	3.67
5	Canada	9.2	5	Slovenia	3.66
6	Ireland	8.4	6	Portugal	3.63
7	NAFTA	8.4	7	Hungary	2.85
8	Finland	7.7	8	S. Korea	2.67
9	Lithuania	6.6	9	France	2.20
10	Japan	6.3	10	Slovakia	1.92
11	Denmark	6.1	11	Lithuania	1.52
12	Sweden	5.9	**12**	**EU-10**	**1.49**
13	S. Korea	5.6	13	Denmark	1.48
14	Netherlands	5.3	14	Russia	1.37
15	Germany	4.8	15	Malaysia	1.30
16	Portugal	4.6	16	UK	0.79
17	Malaysia	4.0	17	Estonia	0.38
18	Latvia	3.7	18	Japan	0.18
19	Austria	2.8	19	Singapore	0.13
20	**EU-15**	**2.7**	20	Cyprus	0.00
21	Belgium	2.5	21	Mexico	-0.11
22	**EU-25**	**2.1**	22	Poland	-0.11
23	Estonia	1.9	23	Brazil	-0.18
24	France	1.1	24	Ireland	-0.28
25	Slovakia	0.9	25	South Africa	-0.36
26	Hungary	0.8	26	Greece	-0.48
27	Cyprus	0.0	27	**EU-25**	-0.76
28	Spain	-0.9	28	Spain	-0.80
29	South Africa	-1.0	29	Canada	-0.97
30	Mexico	-1.8	**30**	**EU-15**	**-1.00**
31	Czech Rep.	-1.9	31	Turkey	-1.12
32	Turkey	-2.3	32	Australia	-1.23
33	**EU-10**	**-3.3**	33	Netherlands	-1.33
34	Russia	-3.7	34	Sweden	-1.45
35	Chile	-4.0	35	Finland	-2.06
36	Argentina	-4.1	36	NAFTA	-2.18
37	Slovenia	-5.6	37	Chile	-2.25
38	China	-5.8	38	Belgium	-2.38
39	Italy	-7.2	**39**	**U.S.**	**-2.52**
40	Poland	-7.2	40	Germany	-2.91
41	Greece	-11.7	41	Austria	-3.31
42	Brazil	-16.0	42	India	-3.40
43	Indonesia	-21.9	43	Argentina	-3.73
44	India	-25.7	44	Italy	-4.09
Average		**0.0**	**Average**		**0.05**

***Absolute change used due to negative scores.**
Source: World Bank, 2005-2010 data.

Trade Balance

Trade balance as a percentage of GDP

Why Is This Important? A nation's trade balance—exports minus imports—is an important indicator of the overall competitiveness of its economy relative to the rest of the world.[55] Some argue that a nation's trade balance does not matter, and in particular, that the poor trade performance of the United States is not an indicator of a competitive challenge.[56] Although it is true that a growing share of trade involves foreign affiliate sales or intra-firm trade, a nation's trade deficit still reflects a nation's reduced competitiveness, even if it doesn't always reflect the reduced competitiveness of a nation's firms.

Indeed, a nation's trade surplus, particularly over a moderate period of time, is a reflection of the ability of the business establishments in it to sell the goods and services they produce in global markets. This is not to say that some nations do not intervene inappropriately, including in currency markets, to spur exports and limit imports.[57] But for better or worse, such actions influence overall trade balance and the ability of the business establishments in those nations to compete globally.

Europe vs. the United States: In terms of trade balance, the EU-25 clearly leads the United States. While the economic recession dampened domestic demand and hence the U.S. trade deficit, in 2009 the United States still ran a trade deficit of 3.8 percent of GDP while the EU-25 as a region ran a slight surplus. At 7 percent, Sweden and Ireland's trade surpluses are twice the size of the United States' trade deficit. The United Kingdom and Spain, countries that share a trend toward deindustrialization with the United States, have fairly large trade deficits, but their deficits were smaller than that of the United States. In Greece and Cyprus the global financial crash spurred an exodus of capital and led to double digit trade deficits.

Overall, the United States ran a trade deficit with the EU-25 of $79 billion in 2010.[58] With regard to individual nations, only France and Spain saw trade deficit shares increase faster than the trade deficit of the United States. Germany and Sweden saw increases in their trade surpluses, in part powered by exports of advanced manufacturing goods, like vehicles, machine tools, and chemicals.

Since 2007 the United States trade deficit improved by nearly 2 percentage points, four times faster than in Europe, however much of this increase can be attributed to lower consumer spending on imports rather than increases in global economic competiveness. In fact, as the recovery has gradually strengthened, the U.S. trade deficit has grown and is now back above 3.5 percent of GDP.

Europe and the United States vs. the Rest of the World: Most nations run either small trade deficits or trade surpluses. In fact, the United States accounts for over 60 percent of the trade deficits of all the countries examined here. Asian nations in particular, with their mercantilist-oriented trade policies which favor exports and discourage imports, are running large trade surpluses. Japan and Korea both run trade surpluses, while Malaysia (22.3 percent), Singapore (17.9 percent) and China (6.1 percent) run trade surpluses larger as a share of GDP than the U.S. trade deficit. Russia, Argentina, and Brazil also run trade surpluses, in part enabled by their exports of natural resource products and until recently, relatively weak currencies.

Over the last decade some Asian nations, notably Korea and Japan, saw declines in their trade surpluses, largely because China's trade surplus almost doubled and both Korea and Japan saw a shift of production to China. The global economic downturn has had a mixed impact on developing countries. Since 2007 commodity prices have propelled South Africa and Argentina but reduced demand in developed countries has stagnated trade in countries like Malaysia and Mexico.

Rank	Country	Score	Rank	Country	Absolute Change* 1999-2009
1	Malaysia	22.3%	1	Estonia	7.8%
2	Singapore	17.9%	2	Argentina	6.3%
3	Russia	8.3%	3	Czech Rep.	6.3%
4	Netherlands	7.7%	4	Germany	4.6%
5	Ireland	7.0%	5	Slovakia	4.3%
6	Sweden	6.9%	6	Latvia	3.8%
7	China	6.1%	7	Chile	3.6%
8	Chile	5.9%	8	Austria	3.6%
9	Germany	5.7%	**9**	**EU-10**	**3.5%**
10	Austria	5.2%	10	Poland	3.4%
11	Czech Rep.	5.1%	11	Hungary	3.3%
12	Argentina	4.6%	12	Netherlands	3.3%
13	Denmark	3.5%	13	Singapore	2.9%
14	Finland	3.2%	14	China	2.5%
15	Indonesia	1.9%	15	Slovenia	2.1%
16	Belgium	1.8%	16	Brazil	1.8%
17	S. Korea	1.4%	17	Sweden	0.7%
18	Hungary	1.2%	18	Portugal	0.7%
19	**EU-15**	**0.7%**	19	Mexico	0.0%
20	Estonia	0.6%	20	Denmark	-0.1%
21	**EU-25**	**0.5%**	**21**	**EU-25**	**-0.2%**
22	Japan	0.2%	22	Australia	-0.4%
23	Brazil	0.1%	**23**	**EU-15**	**-0.5%**
24	Canada	-0.1%	24	Lithuania	-0.7%
25	Italy	-0.5%	25	Ireland	-1.0%
26	Slovenia	-0.8%	26	UK	-1.2%
27	**EU-10**	**-1.0%**	27	NAFTA	-1.5%
28	Australia	-1.8%	28	Japan	-1.5%
29	Mexico	-1.8%	**29**	**U.S.**	**-1.5%**
30	South Africa	-1.9%	30	Spain	-2.1%
31	Poland	-1.9%	31	Belgium	-2.5%
32	France	-2.1%	32	Greece	-2.7%
33	UK	-2.5%	33	Malaysia	-2.8%
34	Turkey	-2.8%	34	Canada	-2.9%
35	Slovakia	-3.3%	35	Italy	-3.0%
36	NAFTA	-3.4%	36	India	-3.2%
37	**U.S.**	**-3.8%**	37	Russia	-3.6%
38	Spain	-4.0%	38	France	-4.4%
39	India	-5.1%	39	South Africa	-4.5%
40	Latvia	-7.0%	40	Indonesia	-6.2%
41	Portugal	-8.9%	41	Finland	-6.2%
42	Cyprus	-11.4%	42	S. Korea	-8.4%
43	Lithuania	-11.4%	43	Cyprus	-11.4%
44	Greece	-11.7%	44	Turkey	-18.2%
Average		**0.7%**	**Average**		**-0.5%**

***Absolute change used due to negative scores.**
Source: World Bank, 1999-2009 data.

Foreign Direct Investment Inflows

Inflows from foreign direct investment as a share of GDP

Why Is This Important? Inward foreign direct investment (FDI) can not only bring to a nation new higher-value added production but also increased competitive forces that spur domestic firms to become more innovative and productive. It is often asserted that when a company builds factories, labs, or offices in a foreign country, it does so because of cheap wages or minimal environmental and labor standards. Yet although some production, particularly more labor-intense production, clearly does locate in low-wage nations, there is still considerable FDI in high-wage nations.

Europe vs. the United States: The EU-25 enjoys more than one-third more inward FDI (from outside Europe) than does the United States. Some EU-15 nations in particular, including Sweden, the Netherlands and the United Kingdom, enjoy significantly higher levels of FDI, although this includes FDI from other European nations. Some EU-10 nations, like Hungary, have even higher levels, ten times higher than the United States. The reason, in part, is that as most of these nations have transformed to market-based economies, they have made concerted efforts to attract FDI, facilitated by a relatively educated workforce with relatively low wage levels supplemented by low corporate taxes.

FDI declined globally after the peak years at the end of the 1990s. But it declined in the EU-25 only about one-forth as much as it declined in the United States, where it declined by almost two-thirds. Most countries have seen a decline in FDI over the last decade with only twelve countries studied receiving more FDI in 2009 than in 1999. Of those countries, four are members of the EU-10.

Europe and the United States vs. the Rest of the World: South Korea and Japan lag the United States in FDI. In large part this is because both nations have worked to limit FDI as a way to protect their domestic companies' market share. This is in contrast to nations such as Singapore and China, which have sought FDI as a way to leapfrog their development. Developing nations such as India, South Africa, and Russia all have higher levels of FDI than the United States and Europe despite having riskier business climates. Canada also has high levels of FDI, reflecting its long position as a location for branch plants of U.S. firms.

Europe and the United States have fallen much further behind many emerging markets in terms of change. Indeed, Turkey, India, South Africa and Russia have all seen their FDI increase by over 100 percent. Most of these gains can be attributed to fact that these countries were not actively engaged in the global economy until the early 2000s.

Rank	Country	Score	Rank	Country	Percent Change 1999-2009
1	Hungary	18.2%	1	Turkey	454%
2	Cyprus	15.5%	2	India	378%
3	Chile	8.3%	3	South Africa	194%
4	Estonia	8.3%	4	Hungary	188%
5	Singapore	7.4%	5	Russia	183%
6	Ireland	7.0%	6	Greece	103%
7	Belgium	6.4%	7	Slovenia	102%
8	Sweden	5.4%	8	Cyprus	77%
9	**EU-10**	**4.5%**	9	Australia	62%
10	Russia	3.7%	10	Japan	62%
11	Australia	3.5%	11	Estonia	34%
12	India	3.0%	12	Italy	17%
13	South Africa	2.7%	13	Chile	-10%
14	Canada	2.6%	14	Sweden	-10%
15	Spain	2.5%	**15**	**EU-25**	**-12%**
16	Netherlands	2.4%	16	China	-28%
17	China	2.4%	17	France	-29%
18	UK	2.3%	18	Austria	-32%
19	Lithuania	2.3%	19	Belgium	-32%
20	France	2.3%	20	Indonesia	-32%
21	Czech Rep.	2.2%	21	Mexico	-36%
22	**EU-25**	**2.2%**	22	Lithuania	-41%
23	Brazil	2.2%	23	NAFTA	-42%
24	Latvia	2.2%	24	Spain	-47%
25	Argentina	2.1%	**25**	**U.S.**	**-50%**
26	Malaysia	2.0%	26	Portugal	-54%
27	Poland	2.0%	27	Malaysia	-55%
28	**EU-15**	**2.0%**	28	Brazil	-56%
29	Austria	1.9%	29	Latvia	-57%
30	Mexico	1.9%	30	Poland	-59%
31	Turkey	1.9%	31	Canada	-60%
32	NAFTA	1.7%	32	Singapore	-61%
33	Slovakia	1.6%	33	Argentina	-65%
34	**U.S.**	**1.6%**	34	UK	-68%
35	Portugal	1.5%	35	Ireland	-69%
36	Indonesia	1.4%	36	Netherlands	-70%
37	Slovenia	1.2%	37	Slovakia	-71%
38	Greece	1.1%	38	Czech Rep.	-77%
39	Italy	1.0%	39	Germany	-85%
40	Germany	1.0%	40	S. Korea	-86%
41	Denmark	0.9%	41	Denmark	-88%
42	Japan	0.4%	42	Finland	-99%
43	S. Korea	0.3%		**EU-10**	**N/A**
44	Finland	0.0%		**EU-15**	**N/A**
Average		**3.4%**	**Average**		**4%**

Source: World Bank, 1999-2009 data.

GDP per Working-Age Adult

GDP per adult age 25-64

Why Is This Important? GDP per adult worker measures both hourly productivity of work and the number of hours worked. Together, both determine the overall standard of living in a nation. By measuring both how productive workers are and how many total hours they work in the formal sectors of a nation's labor market, this measure captures the negative effects on GDP of high unemployment rates and early retirement spurred by over-generous public and private pension systems. GDP per working-age adult is greater than GDP per capita, since the latter includes in the denominator both children and the elderly. As the populations in Japan, Western Europe, and the United States age even more over the next decade, productivity growth rates will need to accelerate for these nations to enjoy rising standards of living.

Europe vs. the United States: The United States leads the world in GDP per worker. EU-15 GDP per worker is just 72 percent of U.S. levels, and EU-10 levels at 40 percent of U.S. levels. This gap reflects both higher per-hour-worked productivity and greater hours worked by the U.S. workforce, both in terms of a longer average work year for American workers and greater workforce participation levels (through lower unemployment rates and later retirement). However, some European nations approach U.S. levels. The Netherlands and Ireland now lag the United States by under 9 percent.

In terms of rate of change, from 1999 to 2009, GDP per working-age adult in the EU-15 grew 6 percent faster than in the United States, in part because productivity growth has strengthened and because unemployment declined. Indeed, with non-employment rates in some EU-15 countries as high as 20 percent during the 2000 recession, such gains are expected. Not surprisingly the EU-10 nations saw even stronger growth, growing about 30 percentage points faster than the United States, in part because their lower wages, coupled with relatively skilled workers and proximity to the EU-15 nations, have led to a spurt of foreign direct investment in industries paying higher wages and employing surplus labor. Since 2006 GDP per worker grew slightly less than in the EU-15 (less than a percentage point) than in the United States. Yet some European nations have grown much faster; the Netherlands has grown 4.5 percent faster than the United States

Europe and the United States vs. the Rest of the World: Singapore, Canada, and Australia are the only countries outside of the EU-15 and the United States to break into the top fifteen countries. Indeed, Singapore is just 3 percent below U.S. levels. Moreover, in part reflecting the same labor market factors that help boost U.S. levels, Australia and Canada are 15 percent and 8 percent higher than the EU-15, respectively. Not surprisingly, even with robust recent growth, developing nations such as India, China, Brazil, Russia and Mexico lag considerably behind, reinforcing the need for these nations to focus not just on attracting manufacturing and technology-based services firms, but on ensuring that all sectors, including retail and wholesale trade, construction, financial services, and government raise their productivity, in part by better integration of IT.

The United States and the EU-15 generally lag the rest of the world in growth in GDP per worker, falling particularly behind Asian nations. Not surprisingly given its higher productivity growth and increases in urban labor supply, China saw the fastest growth, with an almost 90 percent increase in just six years. Korea and Singapore outpaced the United States and EU-15 as well. Moreover, two of the BRIC nations, Russia and India, saw very fast growth as well. And the trend has continued since 2006. Between 2006 and 2009, GDP per working age adult in China and India has grown faster than in any other country. While Latin America countries grew slowly in the early 2000s, since 2006 they have grown rapidly. Strikingly, Mexico has lagged all nations in the rate of growth since 1999, perhaps in part because of the loss of manufacturing to even lower-wage China and the considerable uncertainty in the nation due to high levels of violence around the illegal drug trade.

Rank	Country	Score	Rank	Country	Percent Change 1999-2009
1	U.S.	76,865	1	Portugal	N/A
2	Singapore	74,602	2	China	172.3%
3	NAFTA	70,853	3	Lithuania	90.9%
4	Netherlands	65,174	4	Russia	90.7%
5	Australia	64,152	5	India	89.5%
6	Ireland	63,583	6	Latvia	84.6%
7	Austria	62,708	7	Estonia	78.6%
8	Sweden	60,898	8	Slovakia	75.7%
9	Canada	60,238	9	Poland	65.2%
10	Denmark	59,639	10	S. Korea	63.2%
11	Belgium	59,312	11	Indonesia	62.4%
12	UK	57,843	**12**	**EU-10**	**59.7%**
13	France	57,157	13	Czech Rep.	53.7%
14	Germany	57,034	14	Greece	53.6%
15	**EU-15**	**55,688**	15	Slovenia	52.6%
16	Finland	55,494	16	Argentina	50.1%
17	Japan	54,795	17	Hungary	48.3%
18	**EU-25**	**53,231**	18	South Africa	47.0%
19	Greece	47,806	19	Chile	46.5%
20	Italy	47,641	20	Singapore	46.1%
21	Spain	47,359	21	Malaysia	44.5%
22	Slovenia	42,718	22	Turkey	41.0%
23	Cyprus	42,428	23	Australia	39.5%
24	S. Korea	42,382	24	Brazil	39.2%
25	Czech Rep.	37,567	25	Cyprus	38.8%
26	Slovakia	32,827	26	Finland	37.5%
27	**EU-10**	**31,191**	**27**	**EU-25**	**37.1%**
28	Estonia	29,637	28	Netherlands	35.5%
29	Hungary	29,631	29	Germany	35.4%
30	Poland	28,250	**30**	**EU-15**	**35.1%**
31	Lithuania	27,142	31	Austria	34.9%
32	Argentina	25,785	32	Sweden	34.1%
33	Malaysia	24,639	33	UK	33.1%
34	Mexico	24,073	34	Japan	33.0%
35	Chile	23,951	35	Belgium	30.3%
36	Latvia	23,689	36	Ireland	29.2%
37	Russia	23,576	**37**	**U.S.**	**29.1%**
38	Turkey	20,069	38	France	28.7%
39	South Africa	18,632	39	Canada	28.5%
40	Brazil	17,788	40	NAFTA	28.4%
41	China	10,825	41	Spain	28.0%
42	Indonesia	7,199	42	Denmark	27.2%
43	India	5,730	43	Italy	18.3%
	Portugal	N/A	44	Mexico	16.7%
Average		**42,568**	**Average**		**48.7%**

Source: International Monetary Fund and the World Bank 1999-2009 data.

Labor Productivity

GDP per hour worked[59]

Why Is This Important? GDP per hour worked, the standard measure of productivity, is the most important indicator of nation's economic well-being. GDP per hour worked can be a more accurate measure than GDP per capita because the latter is affected by the number of hours worked, which may be strongly affected by voluntary decisions by adults to substitute free time for work. It is productivity that determines how much nations produce per effort of work. Productivity is largely driven by innovation—particularly, the adoption of new technologies in the workplace. Because of better agricultural technology, for example, four U.S. farmers could feed ten people in 1900, now the same number of farmers can feed 388 people.[60] Likewise, a raft of self-service technologies, such as self-check-in at airports and hotels and movies, and self-check-out at retail stores has boosted productivity in a range of industries.[61]

Europe vs. the United States: On GDP per hour worked, the EU-15 falls behind the United States, reaching 87 percent of U.S. levels. The Netherlands and Belgium are the only two European nations that surpass the United States, reflecting strong high-value traded sectors in both countries. Most EU-15 nations fall behind the United States, with the United Kingdom at 82 percent of U.S. levels and Spain at only 76 percent. Reflecting their long period under Soviet rule, EU-10 nations lag considerably behind. For example, Poland's productivity is just 39 percent of the U.S. productivity level. Perhaps not surprising, many U.S. states dominate the world in terms of labor productivity. In fact, twenty-eight states rank higher than the Netherlands.

In terms of trends, the U.S. lead is expanding. GDP per hour worked grew 8 percent faster in the United States than in the EU-15 between 2000 and 2008. While most EU-15 countries had slower growth rates than the United States, Finland, Ireland and the United Kingdom grew faster. Since 2000 productivity in EU-10 countries has grown faster than in the United States or the EU-15. As EU-10 countries adopted IT later than the United States and EU-15 countries, these productivity gains may reflect similar gains the U.S. experienced in the early 2000s.

Europe and the United States vs. the Rest of the World: The EU-15 and the United States generally lead the world in productivity. Among the countries for which data are available, India, Indonesia, China and Brazil have the lowest productivity, and South Korea surprisingly lags behind about half the countries studied. In addition, given Japan's prominence in many global export markets, the country's low level (70 percent of U.S. levels and 80 percent of EU levels) might surprise many, but Japan's low rank is due to the low productivity of many of Japan's domestic serving industries (e.g., retail, banking).[62]

A number of Asian nations, however, including China, Russia, India, and South Korea, are making more rapid progress in improving productivity than the United States or EU-15. In spite of its image of having a stagnant economy, Japanese productivity actually grew slightly faster than the United States and 8 percent faster than the EU-15 since 2006. While several of the countries that made the most progress between 2000 and 2006 were in the EU-10 (besides China and India), since 2006 developing countries have posted the highest growth rates. Between 2006 and 2009 seven of the ten countries with the fastest productivity growth were developing nations.

Rank	Country	Score	Rank	Country	Percent Change 1999-2009
1	Netherlands	56.94	1	China	174%
2	Belgium	55.93	2	Lithuania	92%
3	**U.S.**	**55.16**	3	Russia	92%
4	Ireland	54.99	4	India	91%
5	France	53.22	5	Latvia	86%
6	Germany	52.60	**6**	**EU-10**	**77%**
7	NAFTA	51.03	7	Estonia	77%
8	Austria	50.00	8	Slovakia	74%
9	**EU-15**	**48.20**	9	S. Korea	74%
10	Sweden	46.79	10	Czech Rep.	69%
11	**EU-25**	**46.01**	11	Hungary	65%
12	UK	45.62	12	Indonesia	64%
13	Denmark	45.35	13	Malaysia	58%
14	Finland	44.69	14	Poland	57%
15	Australia	44.66	15	Slovenia	56%
16	Canada	43.91	16	Argentina	51%
17	Italy	42.99	17	Chile	48%
18	Spain	41.88	18	South Africa	48%
19	Turkey	38.76	19	Greece	47%
20	Japan	38.37	20	Singapore	47%
21	Greece	34.83	21	Finland	45%
22	Slovenia	30.55	22	Ireland	44%
23	Slovakia	27.71	23	UK	41%
24	Portugal	27.02	24	Brazil	40%
25	Czech Rep.	26.24	25	Japan	40%
26	Hungary	25.46	**26**	**U.S.**	**38%**
27	S. Korea	25.33	27	NAFTA	36%
28	**EU-10**	**23.99**	28	Austria	36%
29	Poland	21.54	29	Sweden	36%
30	Lithuania	21.39	30	Australia	35%
31	Estonia	21.12	**31**	**EU-25**	**31%**
32	Argentina	20.32	32	Turkey	31%
33	Malaysia	19.42	33	Germany	31%
34	Mexico	18.69	**34**	**EU-15**	**30%**
35	Latvia	18.67	35	Canada	29%
36	Russia	18.58	36	Netherlands	29%
37	Chile	17.58	37	Portugal	28%
38	South Africa	14.69	38	Mexico	28%
39	Brazil	14.02	39	France	28%
40	China	8.53	40	Belgium	27%
41	Indonesia	5.67	41	Denmark	27%
42	India	4.52	42	Spain	25%
	Singapore	N/A	43	Italy	22%
	Cyprus	N/A		Cyprus	N/A
Average		**34.14**	**Average**		**51%**

Source: OECD, 1999-2009 data

Policy Implications

If economic history teaches us anything it is that regions and indeed entire nations can and do decline economically, at least relative to others. A century ago, one of the fastest growing metropolitan areas in America was Buffalo, New York. As historian Mark Goldman writes, "In 1901, the year Buffalo hosted the Pan American Exposition, the city was buoyant and rapidly expanding the development of heavy industry, particularly of steel, pointed to still more growth and greatness. Buffalo's growth had already been remarkable and its future seemed filled with promise."[63] Likewise, a half century ago, Italy was one of Europe's success stories. While the UK was losing its industrial advantage in the 1950s and 1960s, Italy was gaining its, enjoying the Italian economic miracle—what many in Italy called "il boom."

But greatness lapsed for both. Today, Buffalo is a shell of its former self. By the 2000s, its population was half of what it was at mid-century. Its once monumental steel mills are largely shuttered, and the economy now depends on a mix of service sectors, including higher education, regional banking, and government services. Likewise, Italian economic vitality seems like a long ago dream, so much so that "a fairly large amount of Italy's economic literature has recently focused on the country's stagnation."[64] As Marco Annunziata, the London-based Chief Economic Analyst at Unicredit, stated, "The country has stagnated for at least the last ten years. We have an enormous public debt with no room for maneuvering in the budget. We have low productivity, and growth probably the lowest in Europe. And because of global competition, the system is only going to get worse."[65]

In contrast, other parts of America and Europe have been able to transform, restructure and thrive. Take Boston for example. After WWII, many of its textile and shoe firms fled the region for cheaper labor in the South. Boston looked like it was on the same path as Buffalo, but it subsequently reinvented its economy and today boasts a diverse innovation-based economy with thriving biotechnology, IT, and financial services sectors. Indeed, as we note above, if Massachusetts were a country it would be the most innovative in the world. In Europe, Finland was likewise able to transform itself. When the Soviet Union broke up in 1991, the collapse sent Finland, its largest trading partner, into an economic tail spin. GDP plummeted 9 percent, unemployment rocketed to 20 percent, and exports fell by 13 percent. (By comparison, in the most recent recession, U.S. GDP shrank by 2.6 percent and unemployment peaked at 10 percent.) In response, Finland made a massive bet on competitiveness, innovation, and productivity, while at the same time cutting spending that did not contribute to that goal. The Finnish government significantly expanded its support for technological innovation through direct funding and innovation-based tax incentives and it slashed its corporate income tax rate from 33 percent to 19 percent.[66] And it paid off as Finland is today an innovation leader, ranking second among forty-four nations.

These examples show that some places have been able to rebound from competitiveness challenges and transform themselves, but others have not. The key question therefore is whether over the course of the next decade or two the United States will be like Buffalo and Italy, or like Boston and Finland, rising again through innovation and economic transformation. The answer is not preordained or dependent on serendipity. Success will be the result of hard work and bold policy choices. And the work gets harder as global competition intensifies. In fact, an intense race for global innovation advantage is the factor that most clearly distinguishes today's global economy from the collection of regional and national economies of a generation ago. And it's not a competition for the faint of heart. In fact, it makes the World Cup look like a kids' playground game, for the struggle for innovation advantage is being fought with all the tools at nations' disposal. Nations around the world are establishing national innovation strategies, restructuring their tax and regulatory systems to become more competitive, expanding support for science and technology, improving their education systems, spurring investments in broadband and other IT areas, and taking a myriad of other pro-innovation steps. And unlike the old competition between U.S. states, where all states generally played by certain national rules, "cheating" is a core part of many nations' game plan in the new global competition. Indeed, "innovation mercantilism"—whether stealing intellectual property, discriminating against foreign firms, or manipulating currency—is at the center of many nations' strategies, not just China's.

So where does that leave the United States and Europe? Taking a page out of the Boston and Finnish playbooks, the path forward is actually quite clear. Becoming "Boston" or Finland means moving aggressively into next-generation industries, including advanced IT, robotics, nanotechnology, biotechnology, and high-level business services, while at the same time maintaining output in highly efficient and competitive traditional industries, and continually raising productivity in local non-traded sectors such as retail and health care, particularly through the widespread application of information technology. Becoming Buffalo or Italy implies losing out in the competition for new, globally traded industries, continuing to lose output in existing manufacturing industries, and accepting slow productivity growth in non-traded sectors.

There are two key steps Europe and the United States must take to increase the chances of a "Boston" or "Finland" outcome. First they need to join to together in a robust free trade alliance, in part to increase commercial linkages but also to put real pressure on innovation mercantilists, particularly in Asia.

While global trade and investment has expanded dramatically over the last two decades, tariff barriers have come down, and the new institutions created by the Uruguay Round have contributed significantly to global economic governance, at a practical level many U.S. and European competitors (e.g., countries like Brazil, China, Indonesia, Malaysia, Russia, Singapore, and Vietnam) responded by increasing, not reducing, an array of non-tariff barriers (NTBs) as part of concerted mercantilist strategies. Mercantilism refers to a systemic approach on the part of certain nations to manipulate globalization and trade to their unilateral advantage, often by using practices such as currency and standards manipulation, IP theft, extensive erection of non-tariff barriers, abuse of anti-trust, regulatory, and competition policies, or many others that violate the letter or the spirit of the World Trade Organization (or other bilateral and multilateral trade agreements). Innovation mercantilism involves the use of these practices in order to unfairly grow high-wage, innovation-based jobs and industries.

Unless the practice of innovation mercantilism is significantly constrained, the result will be continued loss of U.S. and European competitiveness. Unfortunately, the members of the WTO have demonstrated that they are unwilling and/or incapable of addressing these corrosive practices. Moreover, too many policy makers and pundits in Europe largely turn

a blind eye to innovation mercantilism, particularly from China, in part because of they mistakenly believe that the United States, and not Europe, will suffer most from it. Once the U.S loses its innovation leadership, this line of thinking goes, Europe gets to be the "top innovation dog." Unfortunately, the blunt reality is that innovation mercantilism hurts both the United States and Europe, and unless they band together to take a much tougher stance against it, both will continue to lose innovation-based competitiveness.

As such, the United States and Europe must engage in a strategic partnership to push back against innovation mercantilism. A key step should be the establishment of a Trans-Atlantic Partnership, modeled after the Trans-Pacific Partnership.[67] While Europe and the United States certainly engage in occasional disputes over trade, by and large they both respect intellectual property rights, the rule of law, the primacy of markets in setting currency prices, the primacy of private investors in determining the location and nature of their investments, and other free trade practices. Over sixty years ago when the first General Agreement on Tariffs and Trade (GATT) was signed, most of the twenty-three original signatories were either European or Commonwealth nations that more or less played by these kind of rules. But as the GATT expanded and evolved into the WTO, it encompassed a wider range of nations, including many who design their trade policies not to maximize allocative efficiency from trade (e.g., to trade wine for textiles, in the Ricardian sense) but to drive exports and to favor domestic firms. As a result, the United States and Europe need once again to take the lead in designing a new trade agreement, but this time for the Ricardians, not for the mercantilists. And the best place to start would be to work to create a Trans-Atlantic Partnership.

While pushing back against innovation mercantilism will be an important step, it will not be enough. Both Europe and the United States need to also ensure that their domestic policies do a much better job of supporting innovation, productivity and competitiveness. Becoming Boston or Finland means putting in place an aggressive national innovation-based economic strategy, which includes both increased government investment in innovation and lower taxes on corporate investment in innovation.

But each region has special challenges. For Europe, it's to fully embrace innovation. As much as European leaders proclaim their support for innovation, many have a decidedly schizophrenic view of it. When they refer to innovation, they usually mean science and technology-based jobs, not innovation. For innovation is the constant transformation of an economy and its institutions. And if there is one thing Europe does not want it is constant transformation, because for most Europeans tradition means something. Even though noted economist Joseph Schumpeter (who coined the term "creative destruction") was a European, Europeans as a whole are not Schumpeterians. They want the benefits of a knowledge-based technology economy without the creative destruction that not only accompanies it but is required to achieve it. Some in Europe get this, but they are fighting an uphill battle to convince fellow Europeans. As Paul Giacobbi, a member of the French Assembly, states, "The idea that nothing will change, no factory will ever close, and restructuring will not be a permanent feature is contrary to everything that the direction of the world tells us every day."[68] Unless Europe can accept that innovation entails plant closures and job losses, new technologies with uncertain social or environmental impacts, and new kinds of business models and organizations that may challenge traditional assumptions about matters like privacy, it's not likely that it will be able to keep up in the race for global innovation advantage.

America's challenge is different. While America too suffers from many advocates who would also like to slow innovation, its major challenge is not timidity, but torpidity. For too many in American believe that that the United States has been number one for so long it will continue to be number one regardless of whether it acts decisively. Given this situation, the thinking goes, there is no real need for the United States to develop and implement a national innovation-based competitiveness strategy. After all the United States didn't have a strategy before and it did just fine.

Moreover, to the extent that there is any favored strategy in the United States it should be to ensure that market forces are allowed to work (e.g., support free trade, simplify the tax code, restrict market power, and deregulate market entry). This ties to America's other big challenge, overthrowing the stale straightjacket of neoclassical economics that holds that countries don't compete, that innovation is manna from heaven, and that government action to spur innovation only makes things worse. Instead, the U.S. needs to embrace a new "innovation economics" that puts advancing innovation at the forefront of economic policy.[69]

Even the most market-oriented state governors know that while effective markets may be key engines of growth, without proactive economic development and innovation policies the prosperity produced by markets may not necessarily accrue within the borders of their state. Indeed, governors see their states as being in intense competition for internationally mobile talent, technology and investment. That's why all fifty U.S. states have proactive economic development strategies. In contrast, because too few Washington policymakers and economists have grasped this new fundamental competitive reality, similar efforts at the federal level are viewed as inappropriate intervention into the workings of the market. It's time for U.S. federal policymakers to realize that the U.S. economy now competes with other nations around the world and, like states after World War II, the federal government too needs to put in place robust national economic development policies.

So the question of whether the twenty-first century will remain the Atlantic century is one that remains to be seen. But we can be sure of one thing: it will not be the Atlantic century if Europe and America continue on the policy path they are on. If they can form an anti-mercantilism alliance, and at the same time each address their own unique challenges to domestic innovation policy then we will see. Who knows, America and Europe might indeed become "Boston" and "Finland."

APPENDIX: WEIGHTING METHODOLOGY

Raw scores were calculated for each country for each indicator. In the composite analyses, the indicators are weighted according to their relative importance and so that closely correlated ones do not bias the results weights add up to 100. In addition, to measure the magnitude of differences between countries and not just their ranks, in each indicator, scores were based on the standard deviation of each from the mean score of all of the countries.

Human Capital	Weight
Higher Education Attainments	5
Science and Technology Researchers	5
Total	**10**
Innovation Capacity	
Corporate Investment in R&D	10
Government Investment in R&D	8
Scientific and Technical Publications	4
Total	**22**
Entrepreneurship	
Venture Capital Investment	6
New Firms	6
Total	**12**
Information Technology Infrastructure	
E-Government	4
Broadband Telecommunications	6
Corporate Investment in Information Technology	10
Total	**20**
Economic Policy	
Effective Corporate Tax Rates	6
Ease of Doing Business	5
Total	**11**
Economic Performance	
Trade Balance	6
Foreign Direct Investment Inflows	3
GDP per Working-Age Adult	8
GDP per Hour Worked	8
Total	**25**
TOTAL	**100**

APPENDIX: DATA SOURCES

Higher Education Attainment

1999 education data: OECD, *2000 Education at a Glance* (2000).
2005 education data: OECD, *2007 Education at a Glance* (2007).
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APPENDIX: DATA SOURCES

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APPENDIX: OVERALL CHANGE SCORE, PERCENT AND ABSOLUTE[70]

Country	Percent Change Total, 1999-2011	Percent Change Total, 2009-2011	Absolute Change Total, 1999-2011	Absolute Change Total, 2009-2011
Argentina	7.72	11.59	6.07	10.22
Australia	6.39	9.94	12.01	13.42
Austria	7.83	7.29	15.33	12.98
Belgium	3.56	5.89	7.21	6.33
Brazil	9.43	13.41	6.33	6.13
Canada	4.94	6.36	8.46	7.03
Chile	14.21	13.87	6.47	7.85
China	28.75	20.35	11.65	7.48
Cyprus	22.11	8.10	12.42	14.28
Czech Rep.	15.25	10.31	15.39	12.72
Denmark	5.87	5.29	12.88	7.09
Estonia	16.28	8.27	15.38	10.82
EU-10	**14.05**	**12.88**	**12.46**	**14.00**
EU-15	**4.57**	**5.05**	**8.60**	**8.11**
EU-25	**5.87**	**6.15**	**9.72**	**9.02**
Finland	7.87	10.20	10.92	10.12
France	4.11	4.42	8.43	7.67
Germany	3.53	6.17	8.66	9.15
Greece	10.08	13.32	10.93	14.15
Hungary	12.86	10.60	13.16	12.62
India	20.45	19.26	2.96	2.80
Indonesia	13.47	23.30	3.83	9.15
Ireland	7.84	4.94	10.09	6.76
Italy	2.69	5.30	2.98	4.92
Japan	8.62	7.05	12.36	8.31
Latvia	16.85	2.15	10.47	4.85
Lithuania	13.94	5.14	10.52	7.76
Malaysia	11.14	13.17	2.05	9.92
Mexico	10.35	14.17	5.44	8.28
NAFTA	4.09	6.13	5.71	8.17
Netherlands	4.20	6.25	10.76	10.83
Poland	8.57	11.77	7.17	12.59
Portugal	13.68	19.77	12.45	14.88
Russia	15.32	12.04	3.49	7.19
S. Korea	15.63	11.29	20.89	15.49
Singapore	7.63	4.18	20.19	7.13
Slovakia	9.81	14.42	10.54	16.18
Slovenia	15.30	13.13	18.45	19.71
South Africa	8.20	8.76	1.01	6.99
Spain	6.08	7.43	8.21	10.08
Sweden	4.44	4.72	6.61	6.73
Turkey	12.50	11.99	3.00	8.95
UK	5.89	7.63	10.51	10.33
U.S.	**3.02**	**6.73**	**5.55**	**9.64**
Average	**10.11**	**9.78**	**9.49**	**9.75**

END NOTES

1. In the 2009 report there were forty countries and regions however Luxembourg and Malta were omitted in 2011 due to data difficulties. In 2009 the U.S. ranked sixth however based on the 2011 methodology the U.S. would have ranked fourth.
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4. For all indicators, the average score is an international calculation and not simply an average of country scores (as this would unfairly and evenly weight small countries with larger ones).
5. Each indicator is weighted on the basis of its relative importance. (See Appendix 1).
6. Because some nations had very low scores in the base year on some indicators, simply using a percentage change score would unfairly benefit these nations. As a result, the overall score combined standard deviations for percent change scores with absolute change scores.
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27. The academic publications indicator combines both the number of publications per country (as a percent of population) with the quality of those publications—defined as the average number of times each article is cited by another academic publication.
28. To find country scores and rankings a composition score was created of two sub-indicators; number of academic publications per population and the average number of citations attributed to each publication. Standard deviations were derived for both metrics and combined for a final score.
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It is not the strongest of the species that survive,
nor the most intelligent,
but the ones most responsive to change.
— Charles Darwin

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The Information Technology and Innovation Foundation
1101 K Street, N.W. | Suite 610 | Washington, DC 20005
mail@itif.org | (202) 449-1351