THE ATLANTIC CENTURY

Benchmarking EU & U.S. Innovation and Competitiveness

February 2009

European-American Business Council

The Information Technology & Innovation Foundation

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The Information Technology and Innovation Foundation

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EXECUTIVE SUMMARY

It has become almost a cliché to point out that the rise of advanced transportation and communication technologies have provided firms much more locational freedom and that the market for an increased share of goods and services is now international. But these and other factors have dramatically increased the pressures on nations to be globally competitive—and the global economic recession will only heighten such pressures. Moreover, many nations no longer compete principally on low costs, but instead compete on the basis of innovation and knowledge as they seek to create, grow and attract high value-added firms. This report assesses nations' innovation-based, global competitiveness.

Unlike other reports that evaluate a country's economic structure or policy factors or economic performance alone, this study is based on a recognition that all these factors must be considered together to create a holistic understanding of how a country is performing in terms of global innovation and competitiveness and whether or not that performance is expected to continue, decline, or increase in the future. The 16 indicators used in this study to assess global competitiveness fall into six broad categories: (1) human capital; (2) innovation capacity; (3) entrepreneurship; (4) IT infrastructure; (5) economic policy; and (6) economic performance.

Unlike several recent studies that find that the United States is the global leader in innovation and competitiveness, (see Box 1) ITIF finds that the United States ranks sixth overall among the 40 nations/regions (with a global competitiveness score of 63.9 that is 15 percent below the leader Singapore's score of 73.4). The EU-15 region ranks 18th in global competitiveness among the 40 nations/regions (with a global competitiveness score of just 52.5, 40 percent below Singapore's score). Thus, our analysis indicates that the United States is not the runaway leader in global competitiveness that some believe it to be, but still leads Europe.

Moreover, strikingly ITIF finds that all of the 39 other countries and regions studied have made faster progress toward the new knowledge-based innovation economy in recent years than the United States. As indicated by the change score, the United States has made the least progress of the 40 nations/regions in improvement in international competitiveness and innovation capacity over the last decade. The EU-15 region has made some improvements over the last decade, but slower than the overall average and as a result, ranks 29th among the 40 nations/regions. But this is still considerably higher than the United States. If the EU-15 region as a whole continues to improve at this faster rate than the United States, it would surpass the United States in innovation-based competitiveness by 2020.

These findings have significant implications for Europe and the United States. First, the rise of global economic competition means that the United States and Europe need to think of themselves as a big state (in the case of the United States) or a big nation (in the case of Europe), and proactively put in place national or continental economic development strategies. This particularly applies to the United States, where the prevailing view among many Washington policymakers is that the United States has been number 1 for so long that it will continue to be number 1. Given this situation, the thinking goes, there is no need for the United States to develop and implement a national economic development or competitiveness strategy. After all the United States didn't have a strategy before and it did just fine.

It's time for U.S. federal policymakers to realize that the U.S. economy now competes with other nations, and like states after World War II did, it too needs to put in place a robust economic development policy. Likewise, the European Commission needs to expand its efforts to spur economic development, particularly by increasing its support for science and innovation and ensuring that its regulatory framework supports innovation.

Although it is beyond the scope of this report to lay out a detailed competitiveness and innovation agenda, the broad outline of such an agenda is as follows. Nations or regions should:

1. Put in place incentives for firms to innovate within their borders. These should include robust R&D tax incentives; incentives, such as accelerated depreciation, to invest in new equipment, particularly IT; and other policies that spur investment in the building blocks of growth, such as workforce development tax credits.

2. Be open to high-skill immigration. High skill immigrants are the source of many new ideas and innovations. Countries that are open to high skill immigration will be able to better succeed.

3. Foster a digital economy. Nations should not only expand public investments in IT in areas such as health care, energy systems, transportation, government, and education, but also put in place the right regulatory frameworks to spur, not limit, digital investment. Nations need to also consider how existing regulatory and public procurement policies can be redesigned to intentionally spur digital transformation.

4. Support the kinds of institutions that are critical to innovation. Nations need to expand funding not just for university research, but for the kinds of mechanisms and institutions that help foster commercialization of research. In addition, they need to boost support for a host of efforts such as local economic development, entrepreneurship development, and workforce training.

5. Ensure that regulations and other related government policies support, not retard, innovation. Too often, powerful interest groups (business, civic, and labor) fight against change and innovation, often under the guise of the public interest, but all too often the result is that progressive and positive innovation is slowed. Nations should ensure that their regulations, procurement, and other related policies tilt toward innovation.

If operating the right way, the competitive pressures between nations can lead them all to do better, spurring them to put in place a host of policies that drive productivity and innovation, which at the end of the day will benefit not just individual nations and regions, but the entire global economy. But if competition leads nations to put in place negative-sum, beggar-thy-neighbor strategies, especially those focused on export-led growth supported by protectionist and mercantilist policies, then the global economy will be worse off. As such it's up to all nations to work over the next decade to put in place the kind of agreements and frameworks that allow international competition to drive nations to be the most innovative and fastest growing, but that do so in ways that spur, not retard global growth. The United States and Europe, having led in the 20th century, have a special responsibility to lead this process in the 21st century.

Overall Score

Rank	Country	Overall Score 2009
1	Singapore	73.4
2	Sweden	71.0
3	Luxembourg	66.2
4	Denmark	64.5
5	S. Korea	64.2
6	**U.S.**	**63.9**
7	Finland	59.6
8	UK	59.2
9	Japan	59.0
10	NAFTA*	58.6
11	Netherlands	58.4
12	France	57.3
13	Ireland	56.4
14	Belgium	56.3
15	Germany	55.0
16	Canada	54.4
17	Austria	52.6
18	**EU-15****	**52.5**
19	Australia	51.5
20	EU-25**	50.6
21	Czech Republic	47.9
22	Estonia	46.1
23	Spain	43.7
24	Hungary	42.5
25	Lithuania	40.8
26	Italy	40.2
27	Portugal	38.7
28	Slovenia	37.6
29	Slovakia	37.0
30	**EU-10****	**36.9**
31	Latvia	36.5
32	Malta	36.2
33	China	36.0
34	Poland	35.4
35	Russia	35.1
36	Cyprus	33.2
37	Greece	31.5
38	Brazil	30.1
39	Mexico	26.0
40	India	21.6
	Average	**36.5**

Change Score 1999-2009

Rank	Country	Change Score (1999-2009)
1	China	19.5
2	Singapore	19.0
3	Lithuania	14.8
4	Estonia	18.1
5	Denmark	17.4
6	Luxembourg	16.9
7	Slovenia	`16.7
8	Russia	15.2
9	Cyprus	14.7
10	Japan	14.4
11	Hungary	14.3
12	Slovakia	14.1
13	Czech Republic	13.8
14	India	13.6
15	Latvia	13.4
16	Austria	13.2
17	S. Korea	13.2
18	Ireland	12.9
19	**EU-10****	**12.8**
20	Spain	10.8
21	Sweden	10.7
22	France	10.6
23	Portugal	10.1
24	Malta	9.9
25	Belgium	9.5
26	EU-25**	9.4
27	Poland	9.4
28	UK	9.0
29	**EU-15**	**8.5**
30	Mexico	8.0
31	Netherlands	7.9
32	Australia	7.4
33	Finland	7.3
34	Canada	6.3
35	Germany	6.3
36	Italy	5.2
37	NAFTA*	5.1
38	Greece	5.1
39	Brazil	3.7
40	**U.S.**	**2.7**
	Average	**11.2**

§ The countries/regions shown in bold are the countries that are the focus of particular analysis and discussion throughout the report.

* 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, Luxembourg, 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, Malta, Poland, Slovakia, and Slovenia. The EU-25 consists of all member states but the two newest members, Bulgaria and Romania, which joined the EU in 2007 and for which there are not yet sufficient data for analysis.

INTRODUCTION

In this report, ITIF assesses the global innovation-based competitiveness of 36 countries and the European Union (EU)-15 region, the EU-10 region, the EU-25 region, and the North Atlantic Free Trade Agreement (NAFTA) region, both as they currently stand and in terms of progress in the last decade. We focus primarily on comparisons between the United States and Europe and comparisons between the United States and European Union and selected other nations around the world to see which is the most competitive in the new innovation economy.

Methodology

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 16 indicators to evaluate the global competitiveness of the United States and other countries:

1. **Human capital:** higher education attainment in the population ages 25–34; and the number of science and technology researchers per 1,000 employed.
2. **Innovation capacity:** corporate investment in research and development (R&D); government investment in R&D; and share of the world's scientific and technical publications.
3. **Entrepreneurship:** venture capital investment; and new firms.
4. **Information technology (IT) infrastructure:** e-government; broadband telecommunications; and corporate investment in IT.
5. **Economic policy:** effective marginal corporate tax rates; and the ease of doing business.
6. **Economic performance:** trade balance; foreign direct investment inflows; real GDP per working-age adult; and productivity.

In order 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.[1] Each indicator was weighted by importance (see Appendix). Collectively the weights equaled 100. The standard deviation was multiplied by the weight and the adjusted standard deviations were added together for the overall indicator. 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.[2] 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.[3]

Europe vs. the United States

The United States leads Europe. The overall score of the EU-15 on the 16 indicators of global innovation and competitiveness is just 82 percent of the U.S. score. The EU-10 scores even lower at just 57 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 13 of the 16 indicators, including knowledge (higher education and number of researchers); innovation (corporate and government R&D and scientific publications); 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 just 3 of the 16 indicators: a lower effective corporate tax, trade performance, and foreign direct investment (FDI) inflows.

These overall scores mask significant differences within Europe. Sweden ranks second of all nations examined and scores 11 percent higher than the United States, while Denmark ranks fourth. But all other EU-15 nations score below the United States, with Spain scoring just 68 percent of U.S. levels. With Greece and Portugal scoring below several developing nations, there is considerable variation between the lowest ranking and highest ranking European nation. Within the EU-10 there is considerable variation as well, with Poland scoring at 55 percent of U.S. levels, but Estonia scoring above Spain, at 72 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 *2008 State New Economy Index*[4], for example, Massachusetts, the highest ranking state, had more than eight times the amount of corporate R&D as a share of its economy than Mississippi, the lowest ranking state. In fact top ranking states like Massachusetts, Washington, and Maryland would likely rank significantly higher than Sweden and other high-ranking EU nations if they were to be included as "nations."

Although the United States ranks higher than Europe, the trends are moving in the opposite direction. Since appoximately the beginning of this decade the EU-15 has made significantly more progress in the 16 indicators as a whole than the United States (although the EU-15's change score is still below average of all nations/regions examined). This is perhaps not surprising given the effort made by both the European Commission and individual EU-15 nations to become more knowledge- and innovation-based. For example, as part of the Lisbon Agenda, Europe has expanded government support for R&D and its R&D tax incentives faster than 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.

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, at a rate slightly above average and considerably higher than that of the United States. The Baltic states in particular have shown rapid rates of progress.

These indicators of regional progress, however, mask individual country trends. Germany and Italy, having found it difficult to embrace the kind of reforms needed to more rapidly progress, score fifth and sixth from the last in progress, respectfully (yet still ahead of the United States). In contrast, many EU-15 nations, including, Denmark, Ireland, and Sweden, have made rapid progress.

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

To find global leaders, Asia is the place to look. Singapore tops all nations, with a score 15 percent higher than the United States and 40 percent higher than the EU-15. As John Kao documented in *Innovation Nation*[5], Singapore has made technological innovation almost a national obsession, putting in place a robust set of policies to lead the knowledge economy. Despite a lower per capita income, South Korea scores slightly ahead of the United States, and 25 percent higher than the EU-15. It also has made technological innovation and international economic competition a national priority. For example, with favorable corporate tax policies and agencies like the South Korea Information Agency and the Industrial Technology Foundation, South Korea has made a concerted effort to prosper through technology-led growth. As such it is putting in place the policies that will help it continue its rapid growth in per capita income (albeit starting from a low base) and ultimately likely catch up with the United States and Europe. Even Japan, which many economic pundits have mistakenly written off (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 93 percent of U.S. levels and 14 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. The main attraction 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.

In terms of progress, however, the picture is quite different. As noted above, the United States ranks last in progress. In other words, every other nation/region made faster progress in the last decade, and many made faster progress than the EU-15. East Asian nations, in particular, are making rapid strides. Perhaps not surprisingly, China comes in first in terms of progress, as they have aggressively promoted modernization and technology development. Singapore not only ranks at the top in overall score, but second in progress. But South Korea and Japan, two nations that experienced their rapid periods of growth at least a decade or two ago, continue to make rapid progress, significantly faster 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.

And other Asian nations, including Russia (part of Russia is in Asia, part is in Europe) and India, also made rapid progress, albeit from low bases. Like China, these nations have a long way to go before they can become true players in the global knowledge and innovation economy. Their strength remains low costs, but if they can effectively address their weaknesses, particularly in business climate, workforce skills, and infrastructure, they are well positioned to continue to make rapid progress and increase productivity in a wide range of sectors.

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

While both Mexico and Brazil closed the gap with the United States over the last decade, they lost ground to the EU-15 and EU-10. 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, Latin America, with the exception perhaps of a few nations like Chile, has not been able to develop and execute the policies that would enable it to get on the high growth, knowledge-based path.

Likewise, the British Commonwealth nations—Australia, Canada, and the United Kingdom—while progressing faster than the United States, have made either less or about the same amount of progress of the EU-15.

Some might attribute these trends, and in particular the United States' poor performance, to a process of convergence, where laggards naturally catch up to leaders. To be sure on some factors there is more likely to be convergence than on others. On indicators where the potential to increase is limited (e.g., the percentage of the adult 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 at the rate of lower income nations. Indeed growth economists have noted that convergence between high-wage and low-wage nations has generally not occurred.[6] Moreover, if convergence really is at work, why have highly developed nations like Austria, Denmark, Japan, and Sweden made much faster progress than the United States?

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 number 1 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 1 and that it is its destiny to remain so almost irregardless of what it does. But both the fact the United States is no longer number 1 and is progressing more slowly than every other nation examined here suggests that riding on past laurels is a risky strategy for the United States, or for that matter any nation.

Overall Scores for Each Country and Region

	Overall		Higher Education		Researchers		Corporate R&D		Government R&D		Scientific Publications		Venture Capital		New Firms	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Singapore	1	73.4	12	38%	5	9.70	9	1.4%	3	0.9%	22	0.3	5	0.25%	2	19.0%
Sweden	2	71.0	15	37%	2	12.52	2	2.5%	2	0.9%	1	2.5	2	0.30%	24	7.2%
Luxembourg	3	66.2	14	37%	14	6.80	10	1.2%	36	0.2%	34	-0.8	N/A	N/A	11	10.7%
Denmark	4	64.5	7	40%	4	10.19	8	1.5%	11	0.7%	2	2.3	1	0.40%	4	14.1%
S. Korea	5	64.2	4	51%	9	7.88	3	2.4%	7	0.7%	23	0.3	4	0.25%	1	19.0%
U.S.	6	63.9	9	39%	6	9.69	6	1.7%	6	0.8%	5	2.1	6	0.18%	6	13.1%
Finland	7	59.6	11	38%	1	16.51	4	2.3%	4	0.9%	4	2.2	14	0.10%	28	6.8%
UK	8	59.2	18	35%	21	5.48	22	0.8%	18	0.6%	6	1.9	3	0.29%	3	15.4%
Japan	9	59.0	3	53%	3	11.03	1	2.6%	20	0.6%	19	0.5	23	0.03%	38	4.4%
NAFTA	10	58.6	16	35%	10	7.82	7	1.6%	8	0.7%	10	1.5	7	0.18%	15	9.9%
Netherlands	11	58.4	17	35%	26	4.50	21	0.9%	16	0.6%	3	2.2	12	0.10%	10	11.3%
France	12	57.3	10	39%	8	8.01	12	1.1%	5	0.8%	14	1.2	16	0.08%	7	11.8%
Ireland	13	56.4	6	41%	19	5.87	23	0.8%	31	0.4%	16	1.1	17	0.06%	12	10.7%
Belgium	14	56.3	5	41%	12	7.59	13	1.1%	26	0.5%	9	1.5	22	0.04%	23	7.4%
Germany	15	55.0	26	22%	13	6.98	5	1.7%	10	0.7%	12	1.4	18	0.06%	8	11.7%
Canada	16	54.4	2	54%	11	7.75	19	0.9%	12	0.7%	7	1.8	10	0.12%	32	6.3%
Austria	17	52.6	27	20%	16	6.78	11	1.1%	1	0.9%	11	1.4	21	0.04%	20	8.5%
EU-15	18	52.5	20	30%	17	6.23	14	1.1%	14	0.6%	13	1.3	11	0.11%	13	10.5%
Australia	19	51.5	13	38%	7	8.43	18	0.9%	9	0.7%	8	1.6	19	0.05%	19	8.7%
EU-25	20	50.6	21	29%	18	6.02	15	1.1%	15	0.6%	15	1.1	13	0.10%	14	10.2%
Czech Republic	21	47.9	33	14%	23	4.83	20	0.9%	17	0.6%	26	0.1	32	0.00%	9	11.3%
Estonia	22	46.1	19	33%	N/A	N/A	25	0.4%	23	0.5%	N/A	N/A	N/A	N/A	5	13.4%
Spain	23	43.7	8	40%	20	5.71	24	0.6%	22	0.5%	18	0.7	15	0.09%	30	6.3%
Hungary	24	42.5	28	20%	27	4.09	26	0.4%	27	0.4%	25	0.2	20	0.05%	17	9.2%
Lithuania	25	40.8	N/A	N/A	N/A	N/A	35	0.2%	28	0.4%	N/A	N/A	N/A	N/A	31	6.3%
Italy	26	40.2	31	16%	30	2.97	27	0.4%	19	0.6%	17	1.0	24	0.03%	34	6.2%
Portugal	27	38.7	29	19%	29	3.30	31	0.3%	25	0.5%	24	0.3	9	0.13%	29	6.4%
Slovenia	28	37.6	24	25%	35	N/A	17	1.0%	24	0.5%	20	0.4	N/A	N/A	21	8.0%
Slovakia	29	37.0	32	16%	22	5.24	37	0.2%	35	0.3%	28	-0.2	30	0.00%	18	9.2%
EU-10	30	36.9	25	22%	25	4.70	28	0.4%	30	0.4%	N/A	N/A	N/A	N/A	22	7.9%
Latvia	31	36.5	N/A	N/A	N/A	N/A	34	0.2%	29	0.4%	N/A	N/A	N/A	N/A	N/A	N/A
Malta	32	36.2	N/A	N/A	N/A	N/A	32	0.3%	39	0.2%	N/A	N/A	N/A	N/A	33	6.3%
China	33	36.0	34	9%	31	1.48	16	1.0%	32	0.4%	32	-0.6	27	0.00%	36	5.3%
Poland	34	35.4	22	26%	24	4.72	36	0.2%	33	0.3%	27	-0.2	29	0.00%	37	4.7%
Russia	35	35.1	1	56%	15	6.80	30	0.3%	13	0.7%	33	-0.7	28	0.00%	16	9.4%
Cyprus	36	33.2	N/A	N/A	N/A	N/A	40	0.1%	34	0.3%	N/A	N/A	N/A	N/A	N/A	N/A
Greece	37	31.5	23	25%	28	3.68	38	0.2%	37	0.2%	21	0.3	31	0.00%	27	7.0%
Brazil	38	30.1	36	8%	33	1.00	29	0.3%	40	0.2%	30	-0.2	8	0.14%	26	7.1%
Mexico	39	26.0	30	18%	32	1.19	33	0.2%	38	0.2%	31	-0.3	25	0.02%	25	7.1%
India	40	21.6	35	9%	34	0.30	39	0.1%	21	0.5%	29	-0.2	26	0.00%	35	5.3%
AVERAGE		**36.5**		**23%**		**6.16**		**1.4%**		**0.7%**		**0.1**		**0.05**		**9.1%**

E-Government		Broadband		IT Investments		Corporate Tax		Business Climate		Trade Balance		FDI		GDP per adult		Productivity	
Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
21	0.70	14	2.6	6	6.96%	10	13%	1	38.8	1	29.3%	3	15.29%	3	77,523	8	47.0
1	0.92	2	5.3	11	6.51%	12	15%	10	11.7	5	7.8%	13	5.07%	7	66,108	9	44.9
13	0.75	15	2.6	N/A	N/A	N/A	N/A	27	-8.8	2	24.5%	N/A	N/A	1	138,840	1	69.7
2	0.91	4	4.7	22	5.83%	31	25%	5	21.5	11	3.8%	19	3.03%	9	65,541	10	44.8
5	0.83	5	4.2	5	7.03%	17	18%	13	6.1	16	1.6%	34	0.59%	25	39,908	30	20.4
3	0.86	11	3.0	2	7.45%	36	32%	2	29.2	32	-5.8%	32	1.13%	2	83,422	5	50.6
14	0.75	6	3.8	30	5.14%	19	19%	11	11.5	8	6.0%	21	2.49%	15	60,585	15	41.4
10	0.79	13	2.8	7	6.74%	25	21%	6	21.3	28	-3.9%	7	7.28%	12	63,815	13	42.3
11	0.77	1	6.6	3	7.14%	35	32%	9	13.2	17	1.4%	35	-0.04%	18	58,107	21	35.8
9	0.80	21	2.1	8	6.60%	34	29%	7	18.4	N/A	N/A	N/A	N/A	5	70,534	14	42.0
4	0.86	3	4.8	9	6.60%	32	26%	14	6.1	6	7.7%	15	4.22%	6	67,343	4	52.2
8	0.80	7	3.4	26	5.75%	11	14%	24	-1.9	24	-1.2%	17	3.70%	14	61,062	6	50.4
17	0.73	30	1.4	17	5.95%	5	10%	4	22.3	4	12.7%	2	19.45%	4	76,278	2	55.2
22	0.68	8	3.3	10	6.58%	21	20%	12	10.4	15	2.8%	5	12.55%	13	63,080	3	53.1
20	0.71	9	3.3	12	6.16%	28	24%	17	2.8	9	5.3%	31	1.38%	16	59,078	7	47.7
6	0.82	10	3.0	18	5.95%	33	26%	3	23.7	12	3.8%	16	4.09%	8	65,870	16	41.3
15	0.74	20	2.2	13	6.11%	24	21%	19	0.7	10	5.2%	29	1.47%	10	64,410	11	44.4
16	0.74	12	2.8	14	6.05%	23	20%	18	2.1	18	-0.1%	N/A	N/A	17	58,254	12	43.8
7	0.81	18	2.5	19	5.93%	27	23%	8	13.9	26	-2.0%	36	-0.64%	11	64,222	17	40.3
18	0.72	16	2.5	20	5.91%	20	19%	22	-0.1	19	-0.1%	28	1.55%	19	53,926	18	40.3
23	0.67	28	1.6	4	7.10%	9	13%	26	-7.7	14	3.2%	9	6.58%	27	38,274	27	22.6
12	0.76	23	1.9	N/A	N/A	N/A	N/A	15	4.7	34	-7.8%	4	15.05%	29	35,525	28	21.6
19	0.72	22	2.0	28	5.48%	18	19%	28	-8.9	31	-5.8%	24	1.90%	21	50,564	19	38.4
28	0.65	25	1.7	21	5.91%	4	10%	25	-7.2	20	-0.2%	10	6.10%	30	32,401	26	23.7
26	0.66	19	2.5	N/A	N/A	1	7%	16	3.4	36	-8.9%	12	5.13%	33	29,829	33	18.1
25	0.67	24	1.8	24	5.78%	29	24%	29	-10.6	21	-0.4%	27	1.61%	20	52,065	20	38.0
29	0.65	26	1.6	27	5.67%	16	16%	23	-0.6	35	-8.2%	20	3.02%	28	37,834	25	24.5
24	0.67	17	2.5	31	4.99%	15	16%	34	-14.3	23	-0.8%	26	1.62%	24	43,704	24	26.5
35	0.59	31	1.0	15	6.02%	3	9%	30	-11.1	29	-4.5%	11	6.07%	31	31,839	32	19.3
30	0.63	33	0.9	29	5.45%	6	11%	31	-11.4	N/A	N/A	N/A	N/A	32	30,931	29	20.9
33	0.59	27	1.6	N/A	N/A	2	8%	N/A	N/A	37	-17.4%	8	6.65%	N/A	N/A	N/A	N/A
27	0.66	29	1.5	N/A	N/A	N/A	N/A	20	0.0	30	-4.5%	1	19.94%	26	39,652	N/A	N/A
39	0.50	39	-0.8	1	7.81%	14	16%	36	-20.0	7	6.7%	18	3.21%	38	8,541	37	5.2
31	0.61	36	0.3	16	5.99%	7	12%	35	-16.4	22	-0.5%	14	4.58%	35	27,103	31	19.6
38	0.51	34	0.6	34	4.22%	8	13%	38	-34.3	3	13.2%	22	2.49%	36	24,047	35	14.6
32	0.60	35	0.3	N/A	N/A	N/A	N/A	21	0.0	N/A	N/A	6	7.61%	23	48,932	23	29.7
36	0.57	32	1.0	32	4.69%	22	20%	33	-14.3	33	-7.8%	33	1.02%	22	49,161	22	30.5
37	0.57	37	-0.6	25	5.77%	13	15%	37	-28.5	13	3.3%	25	1.74%	37	18,822	36	11.4
34	0.59	38	-0.7	33	4.58%	26	22%	32	-14.2	25	-1.4%	23	2.43%	34	29,501	34	17.6
40	0.38	40	-1.9	23	5.79%	30	24%	39	-42.3	27	-2.9%	30	1.40%	39	5,575	38	3.4
	0.70		**0.0**		**6.50%**		**18%**		**0.0**		**0.6%**		**2.60%**		**51,838**		**33.6**

Change Scores for Each Country and Region

	Overall		Higher Education		Researchers		Corporate R&D		Government R&D		Scientific Publications		Venture Capital		New Firms	
	Rank	Score	Rank	Change	Rank	Change	Rank	Change	Rank	Change	Rank	Change	Rank	Change	Rank	Change
China	1	19.5	N/A	N/A	1	111.4%	4	160.3%	12	19.9%	2	253.8%	N/A	N/A	N/A	N/A
Singapore	2	19.0	N/A	N/A	5	70.2%	14	36.8%	17	8.5%	4	189.6%	N/A	N/A	3	47%
Estonia	3	18.1	N/A	N/A	N/A	N/A	5	158.6%	15	13.2%	N/A	N/A	N/A	N/A	7	21%
Denmark	4	17.4	10	38%	9	54.4%	21	12.9%	27	-1.0%	21	25.2%	1	228.7%	2	73%
Luxembourg	5	16.9	2	76%	25	11.5%	36	-21.8%	1	112.5%	8	84.9%	N/A	N/A	31	-10%
Slovenia	6	16.7	N/A	N/A	N/A	N/A	17	20.3%	34	-8.9%	5	139.4%	N/A	N/A	5	25%
Russia	7	15.2	N/A	N/A	32	0.0%	39	-39.3%	8	29.3%	31	-17.5%	N/A	N/A	14	16%
Lithuania	8	14.8	N/A	N/A	N/A	N/A	8	74.5%	6	36.8%	N/A	N/A	N/A	N/A	13	16%
Cyprus	9	14.7	N/A	N/A	N/A	N/A	3	181.3%	3	78.6%	N/A	N/A	N/A	N/A	N/A	N/A
Japan	10	14.4	19	18%	23	13.7%	18	20.2%	30	-6.9%	1	481.3%	6	23.1%	20	7%
Hungary	11	14.3	7	43%	15	31.9%	9	63.2%	11	22.0%	13	48.1%	3	44.1%	27	-8%
Slovakia	12	14.1	N/A	N/A	11	45.6%	40	-47.1%	35	-12.5%	N/A	N/A	22	-90.9%	1	122%
Czech Republic	13	13.8	13	27%	3	85.8%	12	46.1%	9	23.6%	30	-9.7%	25	-98.2%	N/A	N/A
India	14	13.6	N/A	N/A	10	50.0%	37	-22.1%	28	-2.3%	N/A	N/A	N/A	N/A	4	43%
Latvia	15	13.4	N/A	N/A	N/A	N/A	2	181.8%	2	98.4%	N/A	N/A	N/A	N/A	N/A	N/A
Austria	16	13.2	5	54%	13	41.3%	11	47.7%	10	23.1%	12	56.6%	9	-24.6%	19	7%
S. Korea	17	13.2	6	46%	4	71.3%	10	54.6%	7	33.2%	N/A	N/A	N/A	N/A	N/A	N/A
Ireland	18	12.9	8	41%	19	24.9%	25	2.7%	4	52.1%	11	59.5%	13	-39.6%	9	20%
EU-10	19	12.8	N/A	N/A	7	63.6%	19	14.2%	26	-0.1%	15	41.4%	N/A	N/A	10	19%
Spain	20	10.8	17	21%	8	63.1%	15	35.5%	5	46.6%	10	61.2%	11	-30.9%	25	-1%
Sweden	21	10.7	20	16%	14	37.6%	26	2.3%	22	1.6%	23	16.6%	5	27.7%	6	24%
France	22	10.6	15	26%	16	31.3%	29	-4.8%	23	1.6%	24	16.1%	10	-28.4%	11	17%
Portugal	23	10.1	4	58%	30	6.5%	7	99.2%	32	-7.4%	3	215.8%	2	75.0%	N/A	N/A
Malta	24	9.9	N/A	N/A	N/A	N/A	1	338.1%	13	19.1%	N/A	N/A	N/A	N/A	12	17%
Belgium	25	9.5	18	21%	24	11.6%	35	-14.0%	25	0.2%	14	42.3%	21	-65.1%	18	11%
EU-25	26	9.4	14	27%	21	18.0%	24	4.0%	18	8.2%	19	26.1%	8	-16.4%	16	13%
Poland	27	9.4	1	117%	12	43.0%	38	-29.5%	38	-20.2%	9	77.2%	23	-96.3%	26	-4%
UK	28	9.0	12	30%	33	-3.9%	31	-9.8%	19	5.7%	26	10.2%	4	35.8%	15	14%
EU-15	29	8.5	16	25%	26	11.4%	27	0.7%	16	8.8%	20	25.5%	7	-13.1%	17	13%
Mexico	30	8.0	22	13%	2	98.3%	6	129.1%	37	-14.1%	6	113.2%	N/A	N/A	N/A	N/A
Netherlands	31	7.9	9	40%	34	-11.8%	32	-11.3%	36	-12.6%	25	11.8%	17	-51.7%	8	20%
Australia	32	7.4	11	31%	18	25.8%	13	39.8%	20	4.8%	22	17.8%	19	-59.8%	30	-10%
Finland	33	7.3	25	0%	17	30.0%	23	8.1%	29	-6.4%	16	40.3%	15	-49.7%	23	5%
Canada	34	6.3	21	15%	20	23.0%	20	13.8%	14	18.2%	29	-5.7%	18	-58.8%	24	-1%
Germany	35	6.3	N/A	N/A	28	9.1%	22	8.5%	31	-7.1%	18	27.8%	14	-41.8%	N/A	N/A
Italy	36	5.2	3	60%	31	6.1%	34	-13.9%	N/A	N/A	17	35.5%	20	-61.3%	28	-9%
NAFTA	37	5.1	23	6%	27	10.0%	28	-4.2%	21	1.8%	27	-3.9%	12	-36.7%	22	5%
Greece	38	5.1	26	-4%	22	15.0%	16	23.2%	33	-7.6%	7	105.3%	24	-98.0%	29	-9%
Brazil	39	3.7	N/A	N/A	6	66.7%	33	-12.5%	39	-47.1%	N/A	N/A	N/A	N/A	N/A	N/A
U.S.	40	2.7	24	3%	29	7.7%	30	-5.1%	24	1.3%	28	-4.3%	16	-51.2%	21	5%
AVERAGE		**11.2**		**22%**		**35.0%**		**32.0%**		**5.0%**		**66.9%**		**-26.0%**		**10%**

E-Government		Broadband		IT Investments		Business Climate		Trade Balance		FDI		GDP per adult		Productivity	
Rank	Change	Rank	Change	Rank	Change	Rank	Change	Rank	Change*	Rank	Change	Rank	Change	Rank	Change
4	21%	10	1835%	7	5.8%	6	33%	8	3.15%	15	-5%	1	89%	1	99%
38	-6%	17	1064%	33	-11.6%	24	-7%	N/A	N/A	21	-19%	13	38%	8	46%
18	9%	24	512%	N/A	N/A	5	42%	26	-0.58%	2	143%	2	88%	N/A	N/A
15	11%	32	330%	15	-0.7%	22	-5%	20	0.23%	34	-81%	21	28%	21	27%
11	15%	11	1808%	N/A	N/A	32	-62%	1	6.68%	N/A	N/A	11	41%	19	27%
23	6%	27	498%	2	44.4%	23	-5%	10	2.09%	1	177%	14	37%	N/A	N/A
10	16%	1	27829%	30	-9.4%	3	70%	15	1.34%	4	88%	4	69%	2	78%
6	19%	N/A	N/A	N/A	N/A	11	15%	11	1.90%	9	32%	3	84%	N/A	N/A
1	27%	13	1659%	N/A	N/A	N/A	N/A	N/A	N/A	18	-13%	32	22%	N/A	N/A
16	11%	6	3254%	5	8.8%	16	9%	24	-0.34%	35	-118%	23	28%	12	33%
2	26%	15	1191%	31	-10.7%	2	97%	12	1.83%	14	-4%	7	44%	4	52%
14	12%	2	10850%	34	-14.0%	4	57%	9	3.12%	11	9%	6	48%	N/A	N/A
3	24%	4	8498%	32	-11.3%	7	33%	4	4.31%	23	-32%	12	40%	5	52%
28	2%	7	2618%	1	50.7%	20	3%	27	-1.11%	3	121%	5	54%	3	62%
7	17%	14	1384%	N/A	N/A	N/A	N/A	35	-6.53%	8	32%	N/A	N/A	N/A	N/A
17	10%	37	251%	8	3.2%	29	-45%	6	3.63%	25	-48%	26	26%	24	26%
13	12%	34	270%	29	-9.3%	N/A	N/A	36	-8.14%	32	-70%	8	42%	6	49%
25	5%	5	6088%	12	0.6%	19	3%	23	-0.26%	19	-14%	18	33%	N/A	N/A
12	12%	3	10707%	16	-1.0%	25	-7%	N/A	N/A	N/A	N/A	10	41%	7	49%
5	20%	23	513%	28	-9.0%	12	14%	34	-4.74%	27	-60%	33	22%	30	21%
19	9%	35	267%	21	-4.9%	30	-49%	13	1.63%	31	-69%	19	32%	10	36%
8	16%	19	815%	20	-3.1%	26	-20%	33	-3.50%	10	17%	34	22%	18	28%
31	0%	29	467%	23	-5.6%	1	100%	14	1.36%	17	-10%	39	14%	31	21%
26	3%	31	360%	N/A	N/A	N/A	N/A	17	1.04%	12	3%	37	16%	N/A	N/A
30	1%	38	231%	4	10.8%	8	28%	28	-0.02%	7	34%	28	26%	28	23%
24	5%	21	630%	18	-2.4%	N/A	N/A	21	-0.03%	22	-27%	20	32%	17	29%
21	6%	8	2285%	6	6.9%	28	-32%	3	4.86%	16	-7%	15	36%	9	43%
36	-3%	18	1016%	26	-7.8%	9	21%	29	-2.64%	13	0%	17	34%	14	32%
27	3%	22	598%	19	-2.5%	31	-56%	22	-0.04%	N/A	N/A	27	26%	22	27%
32	-1%	9	1863%	3	20.2%	10	18%	19	0.44%	20	-18%	38	15%	29	22%
9	16%	30	361%	11	0.7%	18	3%	7	3.27%	30	-68%	25	27%	27	23%
34	-2%	12	1682%	22	-5.3%	14	11%	25	-0.54%	36	-130%	24	27%	25	26%
33	-2%	28	485%	25	-7.8%	27	-23%	31	-3.40%	26	-54%	16	34%	15	31%
29	1%	26	506%	27	-8.7%	21	-5%	18	0.96%	24	-38%	30	25%	26	24%
39	-6%	25	511%	10	1.5%	33	-88%	5	4.18%	33	-79%	22	28%	20	27%
35	-2%	16	1157%	13	0.4%	34	-94%	30	-2.92%	6	84%	36	19%	32	16%
37	-5%	33	286%	9	1.5%	13	13%	N/A	N/A	N/A	N/A	31	23%	16	30%
22	6%	N/A	N/A	24	-6.6%	N/A	N/A	16	1.24%	5	85%	9	41%	11	35%
20	8%	20	775%	14	0.1%	17	8%	2	5.00%	29	-65%	35	20%	23	27%
40	-7%	36	252%	17	-1.4%	15	11%	32	-3.45%	28	-65%	29	26%	13	32%
	7%		**2778%**		**-1.0%**		**N/A**		**0.00%**		**-42.0%**		**21%**		**22%**

*Trade balance change is based on absolute change.

Box 1: Differences between ITIF Report and Other Global Competitiveness Rankings

In the last few years a number of studies have assessed countries' global competitiveness. Many of these have found that the United States is the world leader in international competitiveness. Such rankings have led many observers to claim that calls for concern or questions about the U.S. competitiveness position are unwarranted. For example, the World Economic Forum's report, *The Global Competitiveness Report 2008-2009*[7], ranked the United States first in global competitiveness two years in a row. While the WEF report gave the United States an overall score 4 percent higher than that of Singapore (which was ranked fifth), ITIF's analysis indicates that Singapore is first in global competitiveness. However, these studies have significant methodological limitations which need to be considered before concluding that all is well.

Some of these studies rely on opinion surveys for many of their indicators. In contrast, ITIF relies exclusively on hard data. For example, the World Economic Forum's *Global Competitiveness Report 2008-2009*, which has ranked the United States first in global competitiveness, uses opinion surveys for about two-thirds of its data.[8] Similarly, IMD's *World Competitiveness Yearbook*, which also ranks the United States as number 1 uses opinion surveys for about one-third of its criteria.[9]

The advantage of opinion surveys is that they can gauge factors where hard data are not available. But because of limited knowledge, combined with likely respondent biases, the risk of using opinion surveys is that they can be a better reflection of a nation's reputation, than its actual position.

To illustrate, consider corporate investment in R&D. WEF ranks the United States third in the world, whereas ITIF ranks the United States ranks fifth. While WEF relies on an executive opinion survey, we use actual R&D investments as reported to governments in firm surveys. And other reports using a similar method find similar results.[10] One likely reason for this discrepancy is that the United States has long been a leader in corporate R&D. But in the last decade, that position has declined. But, the perception of that decline among executives appears to have lagged. This might also be why business leaders ranked the United States number 1 in venture capital in WEF's surveys, yet measured by actual venture capital investments per GDP the United States is fifth.

In addition, some studies rely on aggregate, unadjusted data, whereas ITIF divides every indicator by a denominator (such as GDP, population, or workforce) in order to control for the size of a country. For example, IMD's report uses such indicators as total land area, GDP, employment, and direct investment flows. This approach rewards large countries such as the United States simply for being large. More accurate measures would use metrics adjusted for size (such as GDP per capita).

Finally, other studies define competitiveness differently than this report and therefore draw upon different indicators. For example, *The Economist's E-readiness Rankings 2008*, which ranks the United States as the most digitally advanced nation in the world, measures a nation's entire digital infrastructure and capacity, from personal technology consumption to computer literacy. On the other hand, this report includes digital infrastructure indicators, but also others within the larger context of innovation and competitiveness. Indeed, many of the indicators that are an integral part of ITIF's study (trade balance, FDI, and other economic performance indicators) make up less than 15 percent of *The Economist's* study.[11] Likewise, while the ITIF report focuses primarily on a country's economic structure, policy, and performance to assess national competitiveness, WEF casts a much larger net. The WEF report covers topics such as health care (including, for example, malaria and tuberculosis incidents, which the United States ranks number 1 in both), and infrastructure (such as the available airline seats per kilometer, where the United States also ranks number 1).

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 77 percent of U.S. levels and EU-10 levels just 57 percent. A few EU nations, however, exceed U.S. levels, including Ireland, which has made higher education attainment a key building block of its development strategy, and Spain. But some other European nations rank relatively low. For example, Germany scores at just 56 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.

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 length 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.[12]

When it comes to trends, however, the picture is quite different. The United States ranks last, with almost no increase since 1999. In contrast the share of 25- to 34-year-olds in the EU-15 with a tertiary degree increased by 25 percent, in part because of very strong growth in nations like Ireland and the United Kingdom. In addition, some EU-10 nations increased even faster, including Poland (117 percent).

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, Russia leads with an over 40 percent higher rate, while Canada, Japan, and South Korea 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 Brazil and India below 30 percent of U.S. rates.

The United States is losing ground relative to other nations, and in fact was lowest in overall growth rate in nations 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 South Korea and Australia.

Rank	Country	Percent of adults aged 25-34 with tertiary degree 2005	Rank	Country	Percent Change 1999-2005
1	Russia	56%	1	Poland	117%
2	Canada	54%	2	S. Korea	46%
3	Japan	53%	3	Ireland	41%
4	S. Korea	51%	4	Australia	31%
5	Ireland	41%	5	UK	30%
6	Spain	40%	6	EU-25	27%
7	France	39%	7	France	26%
8	**U.S.**	**39%**	**8**	**EU-15**	**25%**
9	Australia	38%	9	Spain	21%
10	Singapore	38%	10	Japan	18%
11	Sweden	37%	11	Sweden	16%
12	UK	35%	12	Canada	15%
13	NAFTA	35%	13	Mexico	13%
14	**EU-15**	**30%**	14	NAFTA	6%
15	EU-25	29%	**15**	**U.S.**	**3%**
16	Poland	26%	**16**	**EU-10**	**N/A**
17	**EU-10**	**22%**	17	Singapore	N/A
18	Germany	22%	18	Germany	N/A
19	Mexico	18%	19	China	N/A
20	China	9%	20	Russia	N/A
21	India	9%	21	India	N/A
22	Brazil	8%	22	Brazil	N/A
	Average	**23%**		**Average**	**22%**

Source: OECD, 1999-2005 data.

Science and Technology Researchers

Science and technology researchers per 1,000 employed

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, there were over 40 percent more researchers per 1,000 employees in 2005 than in 1995 in Organization for Economic Cooperation and Development (OECD) countries and in non-OECD countries the percent increase was even larger.

Europe vs. the United States: Europe lags behind the United States in the number of researchers, with the U.S. researcher intensity over 55 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 means 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, Sweden, and Denmark, with their technology-driven economies, rank above the United States. However, other EU nations rank considerably below U.S. levels, including France (83 percent), Germany (72 percent), Ireland (61 percent), Spain (59 percent), and the United Kingdom (57 percent). Among EU-10 nations, Poland is just 8 percentage points behind the United Kingdom and at about half of U.S. levels (49 percent).

When it comes to trends though, the situation is different. While both saw increases between 1999 and 2006, researcher intensity in the EU-15 increased faster (30 percent) than in the United States. Lagging nations, including Spain, Poland, and Ireland, made significant gains, at or above 25 percent. However, so too did some leading nations, including Sweden and France. Germany however, grew just slightly faster than the United States, and the only European nation not making progress as fast as the United States was the United Kingdom. The EU-10 region made rapid progress, increasing 64 percent, in part by building upon a solid tradition of science and engineering and being able to take advantage of growth in technology-based industries.

Europe and the United States vs. the Rest of the World: Japan leads Europe and the United States, with a 13 percent higher score than the United States and a 77 percent higher score than the EU-15. Notwithstanding the technical progress in nations like India, Mexico, Brazil, and China, these developing nations still have much lower levels of researchers. In fact, India's level is just 3 percent of U.S. levels, and China's is 15 percent. In part because of its long commitment to military research and strong scientific education, Russia's level is relatively high, exceeding the EU-15 by 9 percent.

Although globally two-thirds of researchers are employed by businesses this figure significantly differs by a country's economic mix and national priorities. For example, in the United States over eighty percent of researchers work for businesses, yet only two-thirds do so in Japan and less than one-half do so in European nations.[13]

When it comes to trends, most other nations are making faster progress than the United States. Perhaps not surprisingly given its concerted push to be a more technologically-based economy China grew the fastest, with its share of researchers more than doubling. But other lagging nations also experienced rapid growth, with Mexico almost doubling (98 percent); Brazil up two-thirds, and India 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 by approximately 70 percent. Finally, Japan and Canada both outpaced the EU-15 and the United States.

Rank	Country	Researchers per 1,000 employed 2006	Rank	Country	Percent change 1999-2006
1	Sweden	12.5	1	China	111%
2	Japan	11.0	2	Mexico	98%
3	Singapore	9.7	3	S. Korea	71%
4	**U.S.**	**9.7**	4	Singapore	70%
5	Australia	8.4	5	Brazil	67%
6	France	8.0	**6**	**EU-10**	**64%**
7	S. Korea	7.9	7	Spain	63%
8	NAFTA	7.8	8	India	50%
9	Canada	7.8	9	Poland	43%
10	Germany	7.0	10	Sweden	38%
11	Russia	6.8	11	France	31%
12	**EU-15**	**6.2**	12	Australia	26%
13	EU-25	6.0	13	Ireland	25%
14	Ireland	5.9	14	Canada	23%
15	Spain	5.7	15	EU-25	18%
16	UK	5.5	16	Japan	14%
17	Poland	4.7	**17**	**EU-15**	**11%**
18	**EU-10**	**4.7**	18	NAFTA	10%
19	China	1.5	19	Germany	9%
20	Mexico	1.2	**20**	**U.S.**	**8%**
21	Brazil	1.0	21	Russia	0%
22	India	0.3	22	UK	-4%
	Average	**6.2**		**Average**	**35%**

Source: UNESCO, Institute of Statistics, 1999-2006 data.

Corporate Investment in R&D

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

Why Is This Important? Industry R&D represents almost two-thirds of global R&D and is therefore a significant driver of innovation.[14] Furthermore, corporate R&D is more geographically mobile than government funded R&D. As some governments have limited the growth of their R&D budgets, corporate R&D has grown faster as a percentage of total R&D investment despite already being more than twice as large as government R&D in 2000.

Europe vs. the United States: The United States significantly outperforms Europe in corporate R&D, with the EU-15 at 64 percent of U.S. levels and the EU-10 at just 22 percent. However, Sweden exceeds the United States by almost 50 percent, in part due to the fact that several large R&D-intensive corporations (e.g., Erickson, Volvo, and SAAB) are headquartered there. But, with the exception of Germany, which is about at the same level as the United States, other EU-15 nations lag significantly behind. For example, the United Kingdom, Ireland, and Spain are all below 50 percent of U.S. levels.

While the United States leads Europe, the trend has been in the other direction. The EU-15 grew 1 percent in its corporate R&D intensity and the EU-10 grew 14 percent. In contrast corporate R&D as a share of GDP declined in the United States by 5 percent. And, some individual EU-15 nations are growing at a rapid pace. In particular, corporate R&D in Spain increased by 36 percent, perhaps due to the fact that it now has one of the most generous R&D tax credits in the world.[15] In contrast, in 2004, the U.S. rank in R&D tax generosity was just 17th of 30 OECD nations.[16]

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 and South Korea, which are 55 percent and 44 percent ahead of the United States, respectively, and 142 percent and 125 percent ahead of the EU-15, respectively. Surprisingly, China's level of corporate R&D intensity is almost at EU-15 levels (91 percent of EU-15), and at current growth rates should surpass the EU-15 within just a few years. Much of this growth is from multinational companies establishing R&D facilities in China.[17] However, most developing nations, including 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, China and Mexico increased their R&D intensity from 1999 to 2006 at a rapid rate, 160 percent and 129 percent respectively. But a number of nations that were already highly R&D-intensive grew at relatively robust rates, including South Korea, Australia, and Singapore. In contrast, the EU-15 was largely unchanged and the United States actually declined. However, surprisingly Brazil, Russia, and India all declined, perhaps in part due to the fact that their economies grew relatively rapidly, meaning the denominator of GDP outpaced growth in the numerator of R&D.

Rank	Country	Corporate investment in R&D as percentage of GDP 2006	Rank	Country	Percent change 1999-2006
1	Japan	2.6%	1	China	160%
2	Sweden	2.5%	2	Mexico	129%
3	S. Korea	2.4%	3	S. Korea	55%
4	Germany	1.7%	4	Australia	40%
5	**U.S.**	**1.7%**	5	Singapore	37%
6	NAFTA	1.6%	6	Spain	36%
7	Singapore	1.4%	7	Japan	20%
8	France	1.1%	**8**	**EU-10**	**14%**
9	**EU-15**	**1.1%**	9	Canada	14%
10	EU-25	1.1%	10	Germany	9%
11	China	1.0%	11	EU-25	4%
12	Australia	0.9%	12	Ireland	3%
13	Canada	0.9%	13	Sweden	2%
14	UK	0.8%	**14**	**EU-15**	**1%**
15	Ireland	0.8%	15	NAFTA	-4%
16	Spain	0.6%	16	France	-5%
17	**EU-10**	**0.4%**	**17**	**U.S.**	**-5%**
18	Brazil	0.3%	18	UK	-10%
19	Russia	0.3%	19	Brazil	-13%
20	Mexico	0.2%	20	India	-22%
21	Poland	0.2%	21	Poland	-29%
22	India	0.1%	22	Russia	-39%
	Average	**1.4%**		**Average**	**32%**

Source: UNESCO, Institute of Statistics, 1999-2006 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 sponsored R&D has been a key factor in growth and innovation. Also, governments are better able to support basic and applied research projects that are high risk and far from commercialization. While much of this research cannot lead to commercial results in the short run, some of it leads to important innovations. For example, one of the most potentially important future technologies is nanotechnology. Although nanotechnology may very well be to the 21st century what steel was to the first part of the 20th century, commercialization of this new technology is limited. As a result, governments fund the majority of nanotechnology research. In 2006 governments sponsored 52 percent of nanotechnology research whereas corporations funded only 43 percent and venture capital funded 5 percent, which is striking since governments as a whole only sponsor roughly one-third of total R&D.[18]

Europe vs. the United States: Notwithstanding the EU's commitment of the Lisbon Agenda, the United States leads Europe in government R&D investment. EU-15 levels are 85 percent of U.S. levels and EU-10 levels are 47 percent of U.S. levels. Again, Sweden is a leader (17 percent higher than the United States), and France is 5 percent above United States levels. However, most EU nations are below United States levels, with the United Kingdom and Spain below 75 percent of U.S. levels.

While the United States leads, its lead over EU-15 nations is shrinking. While U.S. government R&D investments increased from 1999 to 2006 just 1 percent, in the EU-15 they increased 9 percent. Moreover, some EU-15 nations made dramatic increases, including Ireland and Spain, where investments went up 52 percent and 47 percent, respectfully. In contrast, in the EU-10 R&D investment was largely unchanged.

Europe and the United States vs. the Rest of the World: The United States ranks 4th in investments in R&D and the EU-15 ranks 11th. However, Singapore leads both the United States and the EU-15, and South Korea is on par with the United States. Japan's levels are 72 percent of U.S. levels and 85 percent of EU-15 levels. In spite of Ireland's economic progress, that country is actually very far behind in government R&D, only barely ahead of China, and actually below the EU-10. Latin American nations—Mexico and Brazil—invest very little in R&D.

Both the United States and the EU are slipping behind many nations. In part reflecting its strong commitment to boost government R&D, South Korea increased 33 percent. Russia, China and Canada saw sizable increases (29, 20 and 18 percent, respectively). But many other nations failed to maintain progress, with government R&D as a share of GDP falling by 2 percent in India, 7 percent in Japan, 14 percent in Mexico, and by almost half in Brazil.

Rank	Country	Government investment in R&D as percentage of GDP 2006	Rank	Country	Percent change 1999-2006
1	Sweden	0.90%	1	Ireland	52%
2	Singapore	0.87%	2	Spain	47%
3	France	0.81%	3	S. Korea	33%
4	**U.S.**	**0.76%**	4	Russia	29%
5	S. Korea	0.75%	5	China	20%
6	NAFTA	0.73%	6	Canada	18%
7	Australia	0.72%	**7**	**EU-15**	**9%**
8	Germany	0.72%	8	Singapore	9%
9	Canada	0.66%	9	EU-25	8%
10	Russia	0.66%	10	UK	6%
11	**EU-15**	**0.65%**	11	Australia	5%
12	EU-25	0.64%	12	NAFTA	2%
13	UK	0.57%	13	Sweden	2%
14	Japan	0.55%	14	France	2%
15	India	0.52%	**15**	**U.S.**	**1%**
16	Spain	0.51%	**16**	**EU-10**	**0%**
17	**EU-10**	**0.40%**	17	India	-2%
18	Ireland	0.39%	18	Japan	-7%
19	China	0.35%	19	Germany	-7%
20	Poland	0.32%	20	Mexico	-14%
21	Mexico	0.23%	21	Poland	-20%
22	Brazil	0.17%	22	Brazil	-47%
	Average	**0.70%**		**Average**	**5%**

Source: UNESCO, Institute of Statistics, 1999-2006 data.

Share and Quality of World's Scientific and Technical Publications

Scientific and technical publications per million people and the relative prominence of those publications[19]

Why Is This Important? Scientific publications are traditionally viewed as a measurement of the productivity of university and national scientific institutions. However, publications are also a good measurement 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: Close to two-thirds of the world's scientific publications are from the United States and 84 percent are from OECD nations.[20] Not surprisingly the United States clearly leads Europe in scientific publications, scoring 0.8 standard deviations above the EU-15, and four standard deviations above the EU-10. Northern European nations, including Sweden, outperform the United States, largely because they publish many more articles (with a higher degree of citations).

However, over the last 15 years the EU has gained much faster than the United States in the number of scientific articles. The United States has actually seen a decline of 4 percent, compared to an increase of 25 percent for the EU-15 and 41 percent for the EU-10, in part as EU nations have worked to build up their research university system and expand the number of researchers.

Europe and the United States vs. the Rest of the World: Along with Canada and Australia, the United States and the EU-15 lead the world in scientific publications. Japan, South Korea, and Singapore lag significantly behind, and Russia, India, China, and Mexico are even farther behind, in part because of a relatively underdeveloped system of research universities.

In terms of change, however, Asia is making rapid strides, with research articles increasing by 480 percent in Japan, 250 percent in China, and 190 percent in Singapore. 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. Finally, while some developing nations, such as Mexico and China, have made significant progress, others, including Russia and Brazil, have experienced decline.

Rank	Country	Combined Score 2003	Rank	Country	Percentage change in number of publications, 1993-2003
1	Sweden	2.5	1	Japan	481.3%
2	**U.S.**	**2.1**	2	China	253.8%
3	UK	1.9	3	Singapore	189.6%
4	Canada	1.8	4	Mexico	113.2%
5	Australia	1.6	5	Poland	77.2%
6	NAFTA	1.5	6	Spain	61.2%
7	Germany	1.4	7	Ireland	59.5%
8	**EU-15**	**1.3**	**8**	**EU-10**	**41.4%**
9	France	1.2	9	Germany	27.8%
10	EU-25	1.1	10	EU-25	26.1%
11	Ireland	1.1	11	**EU-15**	**25.5%**
12	Spain	0.7	12	Australia	17.8%
13	Japan	0.5	13	Sweden	16.6%
14	Singapore	0.3	14	France	16.1%
15	S. Korea	0.3	15	UK	10.2%
16	**EU-10**	**-0.1**	16	NAFTA	-3.9%
17	Poland	-0.2	**17**	**U.S.**	**-4.3%**
18	India	-0.3	18	Canada	-5.7%
19	Brazil	-0.3	19	Russia	-17.5%
20	Mexico	-0.5	20	Brazil	N/A
21	China	-0.6	21	S. Korea	N/A
22	Russia	-0.6	22	India	N/A
	Average	**0.0**		**Average**	**67.0%**

Source: National Science Foundation and OECD, 1993-2003 data.

Venture Capital[21]

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. These young firms, many of which are too small to raise capital in public markets and too underdeveloped to secure bank loans, have extremely high growth potential. 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, the percentage of venture capitalists that see a future outside their home country is growing. Over 50 percent of U.S. venture capital firms expect to begin investing abroad.[22]

Europe vs. the United States: While some EU nations exceed the United States in venture capital investments, overall the United States invests almost 60 percent more in venture capital than do EU-15 nations collectively. However, because of significant growth in recent years, Sweden and the United Kingdom now lead Europe and both have more than 60 percent higher venture capital rates of investment than the United States. But other nations such as Spain and Ireland, which have been more dependent on branch plants for prosperity, or France and Germany, which are more dependent on large firms and innovations within existing firms, invest less.

Notwithstanding the United States' lead, the EU-15 is closing the gap. As an illustration, while venture funds invested fell by almost half in the United States between 2000 and 2005, they increased in the United Kingdom and Sweden by over 25 percent. In fact, the United States trailed the EU-15 in rate of growth of venture capital. Surprisingly, however, there appears to have been a large fall off in venture investing in many of the EU-10 nations.

Europe and the United States vs. the Rest of the World: Generally, Europe and the United States lead the world in venture investing. Two exceptions are South Korea and Singapore, with investments 35 percent more than in the United States, and almost twice as much in the EU-15. But generally Asian nations enjoy much lower levels of venture investing. Japan, with its less entrepreneurial culture, has venture levels of just 17 percent of U.S. levels. And India and China, largely dependent upon multinational branch plants, enjoy almost no venture capital investment.

While data on change in venture investing are limited, Japan outperformed most EU nations and the United States in venture capital growth, perhaps because they were starting from a much smaller base. Canada and Australia, in contrast, however, saw steep declines in venture investing.

Rank	Country	Venture capital as a percentage of GDP 2006	Rank	Country	Percentage change 2000-2006
1	Sweden	0.30%	1	UK	36%
2	UK	0.29%	2	Sweden	28%
3	S. Korea	0.25%	3	Japan	23%
4	Singapore	0.25%	**4**	**EU-15**	**-13%**
5	**U.S.**	**0.18%**	5	EU-25	-16%
6	NAFTA	0.18%	6	France	-28%
7	Brazil	0.14%	7	Spain	-31%
8	Canada	0.12%	8	NAFTA	-37%
9	**EU-15**	**0.11%**	9	Ireland	-40%
10	EU-25	0.10%	10	Germany	-42%
11	Spain	0.09%	**11**	**U.S.**	**-51%**
12	France	0.08%	12	Canada	-59%
13	Ireland	0.06%	13	Australia	-60%
14	Germany	0.06%	14	Poland	-96%
15	Australia	0.05%	15	S. Korea	N/A
16	Japan	0.03%	16	Singapore	N/A
17	Mexico	0.02%	17	Brazil	N/A
18	India	0.00%	18	Mexico	N/A
19	China	0.00%	19	India	N/A
20	Poland	0.00%	20	China	N/A
21	Russia	0.00%	21	Russia	N/A
22	**EU-10**	**N/A**	**22**	**EU-10**	**N/A**
	Average	**0.05%**		**Average**	**-26%**

Source: OECD, 1999-2006 data.

New Firms

New corporations as a percent of total corporations[23]

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 variables behind a country's entrepreneurship rate appear with differing degrees in different countries, one thing is certain: in a globalized economy where international large 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 regulatory rates artificially raise barriers to entry that decrease entrepreneurship.[24]

Europe vs. the United States: Consistent with its long-standing entrepreneurial culture, the United States leads the EU-15 with about 20 percent more entrepreneurship, and the EU-10 with about two-thirds more. But the United Kingdom now outperforms the United States, with 17 percent more entrepreneurship.

In terms of growth in entrepreneurship from 2002 to 2005, however, the EU-15 and EU-10 saw growth rates 7 and 14 percentage points faster, respectively, than in the United States. In fact, only Spain and Poland saw slower rates of growth in entrepreneurship.

Europe and the United States vs. the Rest of the World: Among the nations examined here, Singapore and South Korea lead in entrepreneurship, in part reflecting both nations' commitment to spur high technology development. But generally the United States leads most other nations. For example, notwithstanding a long focus on promoting small enterprises, India lags far behind in entrepreneurship, in part because of its large informal sector. Japan, with its focus on large organizations and lifetime employment, ranks even lower, at levels of about one-third of U.S. rates. Surprisingly, given that the UK levels are so high, Canadian and Australian entrepreneurship rates are quite low. Latin American nations generally have low levels of entrepreneurship, with Spain and Mexico having rates around half that in the United States.

In terms of change, however, America's position is slipping. Most other nations saw faster growth. Entrepreneurship in Singapore, for example, grew 42 percentage points faster than entrepreneurship in the United States, and in India, entrepreneurship grew 35 percentage points faster. Even Japan grew faster, albeit, only slightly, than the United States.

Rank	Country	Percentage of new corporations 2005	Rank	Country	Percent change 2003-2005
1	S. Korea	19%	1	Singapore	47.1%
2	Singapore	19%	2	India	42.6%
3	UK	15%	3	Sweden	24.0%
4	**U.S.**	**13%**	4	Ireland	19.7%
5	France	12%	**5**	**EU-10**	**19.5%**
6	Germany	12%	6	France	17.4%
7	Ireland	11%	7	Russia	15.7%
8	**EU-15**	**11%**	8	UK	13.6%
9	EU-25	10%	9	EU-25	12.8%
10	NAFTA	10%	**10**	**EU-15**	**12.7%**
11	Russia	9%	11	Japan	6.7%
12	Australia	9%	**12**	**U.S.**	**5.3%**
13	**EU-10**	**8%**	13	NAFTA	4.9%
14	Sweden	7%	14	Canada	-0.7%
15	Mexico	7%	15	Spain	-0.9%
16	Brazil	7%	16	Poland	-3.6%
17	Spain	6%	17	Australia	-9.9%
18	Canada	6%	18	Germany	N/A
19	India	5%	19	S. Korea	N/A
20	China	5%	20	Mexico	N/A
21	Poland	5%	21	Brazil	N/A
22	Japan	4%	22	China	N/A
	Average	**9%**		**Average**	**9.6%**

Source: World Bank, 1999-2006 data.

E-Government

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. 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[27]. 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 16 percent and the EU-10 by over one-third. However, one European nation, Sweden, exceeds the United States.

When it comes to progress, however, the picture is reversed. The United States ranks lowest of all nations in progress, in fact seeing its score decline 7 percent between 2003 and 2008. In contrast, the EU-15 made modest progress, improving 3 percent, while the EU-10 increased even faster, at 12 percent. Some European nations in particular showed significant progress, including Spain (20 percent) and France (16 percent).

Europe and the United States vs. the Rest of the World: Overall the EU and the United States lead the world in e-government, but there are some notable exceptions. South Korea, Canada, Australia, and Japan, all nations that have developed national e-government strategies, rank higher than the EU-15 and EU-10. In contrast, the BRICs (Brazil, Russia, India, and China) score low, in part because e-government success is moderately correlated with per capita income levels.

When compared to the rest of the world, the United States showed less progress than any other nation, while many nations advanced faster than the EU-15. Consistent with their national digital transformation strategies implemented in this decade, Japan and South Korea progressed faster than the EU-15, while China showed rapid growth, albeit from a lower level of initial progress.

Rank	Country	2008 Index	Rank	Country	Percent change 2005-2008
1	Sweden	0.92	1	China	21%
2	**U.S.**	**0.86**	2	Spain	20%
3	S. Korea	0.83	3	France	16%
4	Canada	0.82	4	Russia	16%
5	Australia	0.81	**5**	**EU-10**	**12%**
6	France	0.80	6	S. Korea	12%
7	NAFTA	0.80	7	Japan	11%
8	UK	0.79	8	Sweden	9%
9	Japan	0.77	9	Brazil	8%
10	**EU-15**	**0.74**	10	Poland	6%
11	Ireland	0.73	11	EU-25	5%
12	EU-25	0.72	12	Ireland	5%
13	Spain	0.72	**13**	**EU-15**	**3%**
14	Germany	0.71	14	India	2%
15	Singapore	0.70	15	Canada	1%
16	**EU-10**	**0.63**	16	Mexico	-1%
17	Poland	0.61	17	Australia	-2%
18	Mexico	0.59	18	UK	-3%
19	Brazil	0.57	19	NAFTA	-5%
20	Russia	0.51	20	Singapore	-6%
21	China	0.50	21	Germany	-6%
22	India	0.38	**22**	**U.S.**	**-7%**
	Average	**0.70**		**Average**	**7%**

Source: United Nations, 2003-2008 data.

Broadband Telecommunications

Broadband quality and subscription rates per capita[26]

Why Is This Important? A country's broadband penetration rate does not just represent 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.

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, the United States actually leads the EU-15 in broadband adoption and quality, albeit by a small degree.[27] However, this 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 one-third the level.

With regard to the rate of broadband adoption, the EU-15 has progressed more than twice as fast than the United States, in large part because the United States was even further ahead in 2002.[28] 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 nations made progress much faster than the EU-15 and the United States in large part because they were starting from a low base.

Europe and the United States vs. the Rest of the World: The EU-15 and the United States rank behind Japan and South Korea in broadband, with these nations scoring between 120 and 42 percent higher, respectively than the United States. Japan and South Korea ranked first and third, respectfully, partially because of their large urban population 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 Japan and South Korea's leadership is simply a product of geographic coincidence. Both countries have long had some of the world's most sophisticated technology policies. 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) score quite low, in large part because broadband adoption is significantly influenced by levels of per capita income.

Most nations made faster progress in broadband adoption than the EU-15 and the United States, in large part because they started from a much smaller base, in some cases from virtually no subscribers. In contrast, nations like South Korea (and United States) which was the earliest leader in broadband, had much slower growth.

Rank	Country	Combined Score 2008	Rank	Country	Percentage change in number of subscribers 2005-2008
1	Japan	6.6	1	Russia	27,829%
2	Sweden	5.3	**2**	**EU-10**	**10,707%**
3	S. Korea	4.2	3	Ireland	6,088%
4	France	3.4	4	Japan	3,254%
5	Germany	3.3	5	India	2,618%
6	Canada	3.0	6	Poland	2,285%
7	**U.S.**	**3.0**	7	Mexico	1,863%
8	**EU-15**	**2.8**	8	China	1,835%
9	UK	2.8	9	Australia	1,682%
10	Singapore	2.6	10	Singapore	1,064%
11	EU-25	2.5	11	UK	1,016%
12	Australia	2.5	12	France	815%
13	NAFTA	2.1	13	Brazil	775%
14	Spain	2.0	14	EU-25	630%
15	Ireland	1.4	**15**	**EU-15**	**598%**
16	**EU-10**	**0.9**	16	Spain	513%
17	Russia	0.6	17	Germany	511%
18	Poland	0.3	18	Canada	506%
19	Brazil	-0.6	19	NAFTA	287%
20	Mexico	-0.7	20	S. Korea	270%
21	China	-0.8	21	Sweden	267%
22	India	-1.9	**22**	**U.S.**	**252%**
	Average	**0.0**		**Average**	**2,778%**

Source: International Telecommunications Union and Said Business School, 2008 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.[29] 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.[30] IT also spurs growth and increased quality of life in developing nations.[31]

Europe vs. the United States: The United States invests approximately 25 percent more in IT than does the EU-15 and this accounts for a considerable share of the increased rate of productivity growth in the United States than in Europe.[32] However, some European nations, such as the United Kingdom and Sweden, come close to U.S. investment rates. In contrast, France and Spain lag behind. Given Ireland's intention of becoming an IT leader, its performance is at only 80 percent of U.S. levels suggesting that it, as well as most other nations need to ensure widespread IT investment in all sectors, not just focus on growing the IT industry itself.

With regard to change, between 2003 and 2007 IT investment declined slightly slower in the United States than in the EU-15 and at the same rate as the EU-10. However, among EU nations, Poland, Germany, and Ireland saw growth.

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. Surprisingly, China leads the world in terms of IT investments as a share of GDP, with the United States coming in a close second.[33] But Japan, South Korea, and Singapore—nations with explicit national digital transformation strategies—rank right behind the United States. Notwithstanding its low levels of income, India ranks moderately high, higher than EU-10 levels, reflecting in part the rapid growth of the software and IT services industries. In contrast, Russia and Mexico rank at the bottom, with much lower levels of investment.

Reflecting its becoming the preeminent IT off-shoring destination in the world, India leads all nations in growth rates, seeing a more than 50 percent increase in IT intensity. Japan and China also saw modest growth rates, ahead of Europe and the United States. Surprisingly, IT leaders South Korea and Singapore saw declines.

Rank	Country	Corporate investment in IT as a percent of GDP 2007	Rank	Country	Percent change 2003-2007
1	China	7.8%	1	India	51%
2	**U.S.**	**7.5%**	2	Mexico	20%
3	Japan	7.1%	3	Japan	9%
4	S. Korea	7.0%	4	Poland	7%
5	Singapore	7.0%	5	China	6%
6	UK	6.7%	6	Germany	2%
7	NAFTA	6.6%	7	Ireland	1%
8	Sweden	6.5%	8	Brazil	0%
9	Germany	6.2%	**9**	**EU-10**	**-1%**
10	**EU-15**	**6.1%**	**10**	**U.S.**	**-1%**
11	Poland	6.0%	11	NAFTA	-2%
12	Ireland	6.0%	12	EU-25	-2%
13	EU-25	5.9%	**13**	**EU-15**	**-3%**
14	Canada	5.9%	14	France	-3%
15	Australia	5.9%	15	Sweden	-5%
16	India	5.8%	16	Australia	-5%
17	Brazil	5.8%	17	UK	-8%
18	France	5.8%	18	Canada	-9%
19	Spain	5.5%	19	Spain	-9%
20	**EU-10**	**5.4%**	20	S. Korea	-9%
21	Mexico	4.6%	21	Russia	-9%
22	Russia	4.2%	22	Singapore	-12%
	Average	**6.5%**		**Average**	**-1%**

Source: The World Information Technology and Services Alliance, 2003-2007 data.

Effective Corporate Tax Rates

Average five-year effective marginal corporate tax rate

Why Is This Important? Higher corporate 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 all the deductions, exemptions, and credits that companies qualify for. 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.[34] Consequently, countries with competitive corporate taxes are more attractive to businesses.[35] 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 that are 68 percent higher than in the EU-15 and 185 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 be a more attractive location for internationally mobile business investment. Some have done this with generous incentives, including R&D tax credits[36], while others have lowered statutory rates. However, effective tax rates differ significantly throughout Europe, with Ireland, Spain, and Sweden having relatively low effective rates, and Germany 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 lower corporate 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 Ireland, the most competitive of the nations or regions included here. For example, Poland's effective corporate rate is just 12.5 percent, compared to 32 percent in the United States. In addition, three of the BRICs (Brazil, Russia, and China) have similarly adopted lower effective corporate rates to be attractive to FDI. Japan and the United States have the highest rates.

Rank	Country	Effective corporate tax rate, 2008[37]
1	Ireland	9.6%
2	**EU-10**	**11.2%**
3	Poland	12.5%
4	Russia	13.0%
5	Singapore	13.2%
6	France	14.4%
7	Sweden	14.9%
8	Brazil	15.5%
9	China	15.7%
10	S. Korea	18.4%
11	Spain	18.6%
12	EU-25	19.0%
13	**EU-15**	**20.5%**
14	UK	21.4%
15	Mexico	22.5%
16	Australia	23.0%
17	Germany	23.6%
18	India	24.3%
19	Canada	25.9%
20	NAFTA	29.2%
21	Japan	31.6%
22	**U.S.**	**32.0%**
	Average	**18.0%**

Source: World Bank, 2008 data.

Ease of Doing Business

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. By ranking countries on 10 sub-indicators, the overall indicator for ease of doing business captures the regulatory framework of each country. The 10 indicators are, ease of starting a business, dealing with construction permits, hiring workers, registering property, getting credit, protecting investors, paying taxes, 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, particularly Spain and France, and ranks even higher than EU-10 nations, such as Poland. Among EU nations, only the United Kingdom, Denmark, and Ireland score above 50 percent of the United States' score, and even a nation like Ireland, which has made streamlining its regulatory system to make it attractive to business, scores significantly behind the United States.

Moreover, between 2005 and 2008, it's gotten easier to do business in the United States, while it's gotten somewhat harder in the EU-15 and marginally harder in the EU-10. In particular it has gotten significantly harder in Sweden, Poland, and Germany. Only in Spain, Ireland, and the United Kingdom has it been getting easier to do business. The United Kingdom has shown faster improvement than the United States, in large part because of concerted efforts by the U.K. government to foster growth and innovation.

Europe and the United States vs. the Rest of the World: Singapore scores significantly better than the Unites States, which ranks second. 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 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. As a former socialist nation, so too does India.

While Singapore experienced a decline in the ease of doing business greater than the United States, most other nations gained. In part because they are starting from such low scores and there is so much "low hanging fruit" to pick to make progress, countries like Brazil and Mexico improved modestly, while China and Russia improved faster than both the EU-15 and the United States. But these nations still have a very long way to go until their business climate is fully supportive of growth.

Rank	Country	2008 Score	Rank	Country	Percent change 2005-2008
1	Singapore	38.8	1	Russia	70%
2	**U.S.**	**29.2**	2	China	33%
3	Canada	23.7	3	UK	21%
4	Ireland	22.3	4	Mexico	18%
5	UK	21.3	5	Spain	14%
6	NAFTA	18.4	6	NAFTA	13%
7	Australia	13.9	7	Australia	11%
8	Japan	13.2	**8**	**U.S.**	**11%**
9	Sweden	11.7	9	Japan	9%
10	S. Korea	6.1	10	Brazil	8%
11	Germany	2.9	11	Ireland	3%
12	**EU-15**	**2.1**	12	Canada	-5%
13	EU-25	-0.1	13	Singapore	-7%
14	France	-1.9	**14**	**EU-10**	**-7%**
15	Spain	-8.9	15	France	-20%
16	**EU-10**	**-11.4**	16	Poland	-32%
17	Mexico	-14.2	17	India	-47%
18	Poland	-16.4	18	Sweden	-49%
19	China	-20.1	**19**	**EU-15**	**-56%**
20	Brazil	-28.5	20	Germany	-88%
21	Russia	-34.3	21	EU-25	N/A
22	India	-42.3	22	S. Korea	N/A
	Average	**0**		**Average**	**N/A**

Source: World Bank, 2005-2008 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.[38] Some argue that a nation's trade balance doesn't matter, and in particular, that the poor trade performance of the United States is not an indicator of a competitive challenge. 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 does not reflect a 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. 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. In 2006, while the United States ran an almost unprecedented trade deficit of almost 6 percent of GDP, the EU-25 as a region was largely in balance. At 12.6 percent, Ireland's trade surplus is twice that of the United States' trade deficit. Germany and Sweden run trade surpluses above 5 percent of GDP. 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.

Overall, the United States ran a trade deficit with the EU-25 of $103 billion in 2007, notwithstanding the increase in the value of the euro. Moreover, the trade deficit has been mounting faster in the United States than in the Europe. The U.S. trade deficit with the EU increased from $27 billion in 1999 to $103 billion in 2007. With regard to individual nations, only France and Spain saw trade deficits increase faster than the trade deficit of the United States, but Germany and Sweden saw increases in their trade surpluses, in part powered by exports of advanced manufacturing goods, like vehicles, machine tools, and chemicals.

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 70 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 South Korea both run trade surpluses, while China (6.7 percent) and Singapore (almost 30 percent) run trade surpluses larger as a share of GDP than the U.S. trade deficit. Brazil, Canada, and Russia also run trade surpluses, in part enabled by their exports of natural resource products and until recently, relatively weak currencies.

In terms of change in trade balance in the last decade, the U.S. trade performance is among the worst. Some Asian nations, notably South Korea and Japan, saw declines in their trade surpluses, largely because China's trade surplus almost doubled and both South Korea and Japan saw a shift of production to China. Most other nations, including Russia, Canada, Mexico, and Brazil, saw an increase in their trade balance.

Rank	Country	Average trade balance as a percentage of GDP 2005-2006	Rank	Country	Percentage point change 1999-2006
1	Singapore	29.0%	1	Brazil	5.0%
2	Russia	13.0%	2	Poland	4.9%
3	Ireland	13.0%	3	Germany	4.2%
4	Sweden	8.0%	4	China	3.1%
5	China	7.0%	5	Sweden	1.6%
6	Germany	5.0%	6	Russia	1.3%
7	Canada	4.0%	7	Canada	1.0%
8	Brazil	3.0%	8	Mexico	0.4%
9	S. Korea	2.0%	9	EU-25	0.0%
10	Japan	1.0%	**10**	**EU-15**	**0.0%**
11	**EU-15**	**-0.1%**	11	Ireland	-0.3%
12	EU-25	-0.1%	12	Japan	-0.3%
13	Poland	-1.0%	13	Australia	-0.5%
14	France	-1.0%	14	India	-1.1%
15	Mexico	-1.0%	15	UK	-2.6%
16	Australia	-2.0%	**16**	**U.S.**	**-3.4%**
17	India	-3.0%	17	France	-3.5%
18	UK	-4.0%	18	Spain	-4.7%
19	Spain	-6.0%	19	S. Korea	-8.1%
20	**U.S.**	**-6.0%**	**20**	**EU-10**	**N/A**
21	**EU-10**	**N/A**	21	NAFTA	N/A
22	NAFTA	N/A	22	Singapore	N/A
	Average	**0.6%**		**Average**	**0.0%**

Source: World Bank, 2005-2008 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 almost 50 percent more inward FDI (from outside Europe) than does the United States. Some EU-15 nations in particular, such as Ireland, Sweden, and the United Kingdom, enjoy significantly higher levels of FDI, although this includes FDI from other European nations. Some EU-10 nations, like Poland, have even higher levels, about four 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. Canada has high levels of FDI, reflecting its long position as a location for branch plants of U.S. firms.

FDI declined in most nations after the peak years of the end of the 1990s. But FDI declined in the EU-25 about one-third as much as it declined in the United States, where it declined by almost two-thirds. Some nations, including France and the United Kingdom, outperformed even many EU-10 nations, but some other nations, including Germany, Spain and Sweden saw significant declines in FDI.

Europe and the United States vs. the Rest of the World: Australia, 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 China and Singapore, which have sought FDI as a way to leapfrog their development. Russia, Mexico, and Brazil all have higher levels of FDI than the United States and the EU-25.

Some nations such as India and Russia saw significant increases in FDI, in large part because of efforts to attract foreign investment. Australia, South Korea and Japan declined faster, in part because FDI that might have headed there in the late 1990s now was more likely to go to lower cost China.

Rank	Country	FDI as a percentage of GDP 2005-2006	Rank	Country	Percent change 1999-2006
1	Ireland	19.5%	1	India	121%
2	Singapore	15.3%	2	Russia	88%
3	UK	7.3%	3	France	17%
4	Sweden	5.1%	4	UK	0%
5	Poland	4.6%	5	China	-5%
6	Canada	4.1%	6	Poland	-7%
7	France	3.7%	7	Ireland	-14%
8	China	3.2%	8	Mexico	-18.%
9	Russia	2.5%	9	Singapore	-19%
10	Mexico	2.4%	10	EU-25	-27%
11	Spain	1.9%	11	Canada	-38%
12	Brazil	1.7%	12	Spain	-60%
13	EU-25	1.6%	**13**	**U.S.**	**-65%**
14	India	1.4%	14	Brazil	-65%
15	Germany	1.4%	15	Sweden	-69%
16	**U.S.**	**1.1%**	16	S. Korea	-70%
17	S. Korea	0.6%	17	Germany	-79%
18	Japan	0.0%	18	Japan	-118%
19	Australia	-0.6%	19	Australia	-130%
20	NAFTA	N/A	20	NAFTA	N/A
21	**EU-15**	**N/A**	**21**	**EU-15**	**N/A**
22	**EU-10**	**N/A**	**22**	**EU-10**	**N/A**
	Average	**2.6%**		**Average**	**-42%**

Source: World Bank, 1999-2006 data.

GDP per Working-Age Adult

GDP (PPP) 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 much workers produce and how many total hours workers 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.

Europe vs. the United States: Since World War II, the United States has led Europe in GDP per worker. And it continues to do so, with EU-15 GDP per worker at levels of just 70 percent of U.S. levels, and EU-10 levels at 37 percent. 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 "tiger" of Europe, Ireland, now lags the United States by just 9 percent.

In terms of rate of change, from 2000 to 2006, GDP per working-age adult in the EU-15 grew at the same rate as the United States, in part because productivity growth has strengthened and because unemployment declined. Not surprisingly the EU-10 nations saw even stronger growth, growing about 15 percentage points faster than the United States and EU-15, in part because their lower wages, coupled with relatively skilled workers and proximity to the EU-15 nations, has led to a spurt of foreign direct investment in industries paying higher wages.

Europe and the United States vs. the Rest of the World: The EU-15 and the United States generally lead the rest of the world. However, Singapore is just 7 percent below U.S. levels. Moreover, in part reflecting the same labor market factors that help boost U.S. levels, Canada and Australia are above EU-15 levels, while Japan is on par. 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, 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 world in growth in GDP per worker, 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. South 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. Perhaps surprisingly, another BRIC nation, Brazil, actually lagged behind the United States and EU, as did fellow Latin American nation Mexico, reinforcing the need for many Latin American nations to adopt fundamentally different development strategies.

Rank	Country	GDP per adult aged 25-65 2006	Rank	Country	Percent change 2000-2006
1	**U.S.**	**$83,422**	1	China	89%
2	Singapore	$77,523	2	Russia	69%
3	Ireland	$76,278	3	India	54%
4	NAFTA	$70,534	4	S. Korea	42%
5	Sweden	$66,108	**5**	**EU-10**	**41%**
6	Canada	$65,870	6	Singapore	38%
7	Australia	$64,222	7	Poland	36%
8	UK	$63,815	8	UK	34%
9	France	$61,062	9	Ireland	33%
10	Germany	$59,078	10	Sweden	32%
11	**EU-15**	**$58,254**	11	EU-25	32%
12	Japan	$58,107	12	Germany	28%
13	EU-25	$53,926	13	Japan	28%
14	Spain	$50,564	14	Australia	27%
15	S. Korea	$39,908	**15**	**EU-15**	**26%**
16	**EU-10**	**$30,931**	**16**	**U.S.**	**26%**
17	Mexico	$29,501	17	Canada	25%
18	Poland	$27,103	18	NAFTA	23%
19	Russia	$24,047	19	Spain	22%
20	Brazil	$18,822	20	France	22%
21	China	$8,541	21	Brazil	20%
22	India	$5,575	22	Mexico	15%
	Average	**$51,838**		**Average**	**21%**

Source: International Monetary Fund, 2000-2006 data.

Productivity

GDP (PPP) per hour worked[39]

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 amount 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 10 people in 1900, now the same number of farmers can feed 388 people.[40]

Europe vs. the United States: On GDP per hour worked, the EU-15 falls behind the United States, reaching 85 of percent of U.S. levels. Ireland actually exceeds the United States (and ranks number 1), an amazing feat given its relative low levels two decades ago. Most EU-15 nations fall behind the United States, with the United Kingdom at 84 percent of U.S. levels and Spain at only 76 percent. Reflecting its 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.

In terms of trends, however, GDP per hour worked grew 16 percent faster in the United States as in the EU-15 between 2000 and 2006. Of the EU-15 nations, only Sweden exceeded U.S. growth rates in GDP per hour worked, in part because Swedish organizations adopted IT at very high levels. Spain's growth was just 65 percent of the U.S. rate and German and France were around 85 percent of the U.S. rate. But growth rates in GDP per hour worked in EU-10 nations appear to be much stronger, with rates in Poland 34 percent higher than U.S. rates and rates in the EU-10 over 50 percent of that of the United States.

Europe and the United States vs. the Rest of the World: The EU-15 and the United States generally lead the world in productivity (with Ireland first and the United States second). Among the countries for which data are available, India, China and Brazil have the lowest productivity, and South Korea surprisingly lags far behind. In addition, given Japan's prominence in many global export markets, the country's low rank (70 percent of U.S. levels and 82 percent of EU-15) 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).[41]

A number of Asian nations, including China, India and Singapore, are making more rapid progress in improving productivity than the United States or EU-15. Japan, in spite of its image of having a stagnant economy, actually grew slightly faster than the United States and 6 percent faster than the EU-15.

Rank	Country	GDP per hour worked 2006	Rank	Country	Percent change 1999-2006
1	Ireland	55.2	1	China	99%
2	**U.S.**	**50.6**	2	Russia	78%
3	France	50.4	3	India	62%
4	Germany	47.7	4	S. Korea	49%
5	Singapore	47.0	**5**	**EU-10**	**49%**
6	Sweden	44.9	6	Singapore	46%
7	**EU-15**	**43.8**	7	Poland	43%
8	UK	42.3	8	Sweden	36%
9	NAFTA	42.0	9	Japan	33%
10	Canada	41.3	**10**	**U.S.**	**32%**
11	Australia	40.3	11	UK	32%
12	EU-25	40.3	12	NAFTA	31%
13	Spain	38.4	13	EU-25	29%
14	Japan	35.8	14	France	28%
15	**EU-10**	**20.9**	15	Germany	27%
16	S. Korea	20.4	**16**	**EU-15**	**27%**
17	Poland	19.6	17	Brazil	27%
18	Mexico	17.6	18	Australia	26%
19	Russia	14.6	19	Canada	24%
20	Brazil	11.4	20	Mexico	22%
21	China	5.2	21	Spain	21%
22	India	3.4	22	Ireland	N/A
	Average	**33.6**		**Average**	**22%**

Source: OECD, 1999-2006 data

In the last two decades, there have been at least two major changes to the economies of the United States and the EU. The first is that both economies have become truly global. Fifty years ago continental economies were largely regional in scale. In the United States, this meant that states and regions (e.g., the Northeast) largely competed against each other and in Europe nations (e.g., France, Germany) largely competed against each other. It is not that broader international competition was absent 50 years ago, but it was more limited and based more on commodity production in sectors where nations had "comparative advantages" based on factors such as natural resource endowments.

Today, continental economies are largely global in scale and competition is based on a competitive advantage in a wide array of manufacturing and services industries. This means that for all intents and purposes states in the United States and nations within Europe compete not just against each other, but with regions around the globe. The days when U.S. states or individual European nations largely competed against their continental counterparts are long gone.

This fundamental change means that the United States and Europe need to think of themselves as a big state (in the case of the United States) or a big nation (in the case of Europe), and proactively put in place national or continental economic development strategies, respectively.

This observation particularly applies to the United States, where the prevailing view among many Washington policymakers is that the United States has been number 1 for so long it will continue to be number 1. Given this situation, the thinking goes, there is no real need for the United States to develop and implement a national economic development or competitiveness strategy. After all the United States didn't have a strategy before and it did just fine. Rather 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, and deregulate market entry).

But even the most market-oriented state governors know that while effective markets may be key engines of growth, without proactive economic development 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 50 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. Likewise, the European Commission needs to expand its efforts to spur economic development in the region, particularly by increasing its support for science and innovation and ensuring that its regulatory framework tilts towards innovation.

The second big change to the economies of the United States and the EU in the last two decades is that innovation has become a more central driver of growth and competitiveness. In the old economy in both regions, it was low costs, accumulation of large pools of capital, and economies of scale that drove competitive advantage. In that environment, states (in the United States) and nations (in Europe) that wanted to succeed economically focused on offering firm-specific financial incentives designed to attract or retain establishments of large, multi-region firms by. The idea was that these mobile establishments were seeking the lowest costs, and the job of a U.S. state or European nation was to put forth the best package to attract them.

Today, innovation – the development of new products, new services, new or improved production processes, and new business models – drives growth. Indeed, the application of innovation throughout an economy is critical to prosperity and competitiveness. In the United States, for example, virtually all of the increase in productivity after 1995 has been due to the use of IT by organizations.[42] And there is clear evidence that the growth in the productivity gap between the United States and Europe has been due in large part to the greater and better use of information technology by the United States[43]. But the production of innovation, particularly in technology-based firms that pay significantly higher wages than average, is also driving growth and innovation. These high-wage traded goods and services jobs are now intensely competed for by nations around the globe, each seeking to be the location of choice for these mobile establishments. Nations that will succeed, particularly higher income nations that cannot compete on the basis of low costs, will have to work to compete on the basis of innovation.

Although it is beyond the scope of this report to lay out a detailed competitiveness and innovation agenda, the broad outline of such an agenda is as follows. Nations or regions should:

1. **Put in place incentives for firms to innovate within their borders.** These should include robust R&D tax incentives; incentives, such as accelerated depreciation, to invest in new equipment, particularly IT; or other policies that spur investment in the building blocks of growth, such as workforce development tax credits.[44] Such policies can not only make a nation more competitive in terms of overall corporate taxes, they can spur companies to expand the kinds of investments that are critical to future growth and competitiveness.

2. **Be open to high-skill immigration.** Prosperity depends now more than ever on the continual generation of new ideas as well as the conversion of those ideas into profitable products/services and higher-productivity processes. High skill immigrants are the source of many of these ideas. Countries that are open to high skill immigration will be able to better succeed. While the economic downturn and higher levels of unemployment may reduce the need for this in the short term, it doesn't in the medium and long term.

3. **Foster a digital economy.** Today economic success depends in significant part on how effectively nations incorporate information technology into all aspects of their economy and society. To do so, nations should not only expand public investments in IT in areas such as health care, energy systems, transportation, government, and education, but also put in place the right regulatory frameworks to spur, not limit, digital investment.[45] It also means that nations need to consider how existing regulatory and public procurement policies can be redesigned to intentionally spur digital transformation.

4. Support institutions that are critical to innovation. Nations need to expand funding not just for university research, but for the kinds of mechanisms and institutions that help foster commercialization of research. In addition, it means expanding national (or regional) level support for a host of efforts such as local economic development, entrepreneurship development, and workforce training.

5. Ensure that regulations and other related government policies support, not retard, innovation. Too often, powerful interest groups (business, civic, and labor) fight against change and innovation, often under the guise of the public interest (e.g., protect jobs, preserve privacy, open communication), but all too often the result is that progressive and positive innovation is slowed. Nations should ensure that their regulations, procurement, and other related policies tilt toward innovation and encourage competition. One key source of productivity growth is the elimination or shrinkage of low productivity firms and the growth of high productivity firms. While widespread adoption of IT can help all firms boost productivity, at the same time policies should not retard such creative destruction but should help affected workers and communities effectively adjust.

If operating the right way, the competitive pressures between nations can lead them all to do better, spurring them to put in place a host of policies to drive productivity and innovation, which at the end of the day will benefit not just individual nations and regions, but the entire global economy. But if competition leads nations to put in place negative-sum, beggar thy neighbor strategies, especially those focused on export-led growth supported by protectionist and mercantilist policies, then the global economy as a whole could be worse off. As such it's up to all nations to work over the next decade to put in place the kind of agreements and frameworks that allow international competition to drive nations to be the most innovative and fastest growing, but that do so in ways that spur, not retard global growth. The United States and Europe, having led in the 20th century, have a special responsibility to lead this process in the 21st century.

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. 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	9
Government Investment in R&D	7
Scientific and Technical Publications	4
Total	**20**
Entrepreneurship	
Venture Capital Investment	6
New Firms	6
Total	**12**
Information and Technology Infrastructure	
E-Government	3
Broadband Telecommunications	5
Corporate Investment in Information Technology	12
Total	**20**
Economic Policy	
Effective Corporate Tax Rates	8
Ease of Doing Business	5
Total	**13**
Economic Performance	
Trade Balance	6
Foreign Direct Investment Inflows	3
GDP per Working-Age Adult	6
Productivity	10
Total	**25**
TOTAL	**100**

DATA SOURCES

Higher Education Attainment

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Number of Science and Technology Researchers

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1999 and 2006 nominal GDP: World Bank, *World Development Indicators* (2008).

Government Investment in R&D

1999 government spending on R&D: UNESCO, *Institute of Statistics* (2000)
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New Firms

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E-Government

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Broadband Telecommunications

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Effective Marginal Corporate Tax Rate

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Ease of Doing Business

2005 and 2008 data: World Bank Group, Doing Business, *Economic Rankings database* (2008)
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Trade Balance

Export and import data for 1998-2006: World Bank, *World Development Indicators* (2008).
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Real GDP per Working-Age Adult

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2000, 2006 hours worked: OECD, OECD Factbook 2008: Economic, Environmental and Social Statistics (2008).
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END NOTES

1. For all indicators, the average score is an international calculation and not simply an average of country scores (as this would unfairly evenly weight small countries with larger ones).
2. Each indicator is weighted on the basis of its relative importance. (See Appendix).
3. 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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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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