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Measuring Up

By Robert D. Atkinson

ASSESSING ECONOMIC STRUCTURE FOR SUCCESS IN THE NEW ECONOMY

The economic changes going on today are part and parcel of a broader and fundamental transition to a new economy that brings new opportunities and new challenges. As such it would be a mistake for economic development officials to dismiss the New Economy as some passing fad dreamed up by over-imaginative journalists. Rather, the New Economy is real and continues to transform state and regional economies. **This article discusses what these New Economy changes are and presents results from the 2007 State New Economy Index,** a study which enables state and local economic developers to better assess where their states lie in the transformation to the New Economy.

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How quickly things change. At the end of the millennium, America was riding high and leading the world in innovation and competitiveness. The information technology revolution was transforming our world, ending the business cycle, banishing scarcity, and creating a New Economy. Times were good, jobs plentiful, and government coffers full.

Yet, just a few short years later the "dot-bomb" implosion, the NASDAQ collapse, and slowdown of 2001 rapidly transformed exhilaration into pessimism, leading many to dismiss notions of a New Economy transformation. On top of that, almost overnight it seemed, states and communities confronted powerful new competitors – not from next door, but from around the world – from China, India, Eastern Europe, and other emerging regions. And the challenge now wasn't confined to traditional manufacturing, now it extended to high-tech manufacturing, services, and even research and development.

So what's going on? The reality is that all these changes and more are part and parcel of a broader and fundamental transition to a new economy that brings new opportunities and new challenges. As such it would be a mistake for economic development officials to dismiss the New Economy as some passing fad dreamed up by over-imaginative journalists. Rather, the New Economy is real and continues to transform state and regional economies. This article discusses what these New Economy changes are and presents results from the *2007 State New Economy Index*, a study which enables state and local economic developers to better assess where their states lie in the transformation to the New Economy.

The rise of low wage nations like China means that the competitive advantage of U.S. states and regions will come more from innovation.

WHAT IS THE NEW ECONOMY?

The New Economy refers to a set of fundamental changes in the structure and operation of the economy. The New Economy is a global, entrepreneurial, and knowledge-based economy in which the keys to success lie in the extent to which knowledge, technology, and innovation are embedded in products and services. (See Table 1)

This starts with the fact that the New Economy is *knowledge-driven*. Of course, managers and "knowledge workers" have always been part of the economy, but by the 1990s they became the largest occupational category. Managerial and professional jobs increased as a share of total employment from 22 percent in 1979 to 28.4 percent in 1995 and to 34.8 percent in 2003.[1] In contrast, around one in seven workers are employed as production workers in manufacturing, and even there, knowledge and continual skills enhancement is becoming more important.

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ASSESSING ECONOMIC STRUCTURE FOR SUCCESS IN THE NEW ECONOMY

The economic changes going on today are part and parcel of a broader and fundamental transition to a new economy that brings new opportunities and new challenges. As such it would be a mistake for economic development officials to dismiss the New Economy as some passing fad dreamed up by over-imaginative journalists. Rather, the New Economy is real and continues to transform state and regional economies. This article discusses what these New Economy changes are and presents results from the 2007 State New Economy Index, a study which enables state and local economic developers to better assess where their states lie in the transformation to the New Economy.

Table 1: The New and Old Economies[5]

Issue	Old	New
Markets	Stable	Dynamic
Scope of competition	National	Global
Organizational form	Hierarchical	Networked
Production system	Mass production	Flexible production
Key factor of production	Capital/labor	Innovation/ideas
Key technology driver	Mechanization	Digitization
Competitive advantage	Economies of scale	Innovation/quality
Relations among firms	Go it alone	Collaborative
Skills	Job-specific	Broad and changing
Workforce	Organization Man	"Intrapreneur"[6]
Nature of employment	Secure	Risky

Today's economy is *global*. While it is true that some firms have long had global links, today's globalization is pervasive, as more nations join the global marketplace, and as more goods and services are traded and as more of the production process is interconnected in a global supply web. Since 1980, global trade has grown 2.5 times faster than global GDP. World exports are now at $12.5 trillion, nearly 20 percent of world GDP[2]

Today's economy is *entrepreneurial*. While it is true that entrepreneurial growth, market dynamism, economic "churning," and competition have been features of the American economy since the colonial days, after the 1990s the center of gravity seemed to shift to entrepreneurial activity, while at the same time the underlying operation of the economy accelerated to a new speed, while becoming more customized and innovative. For example, in the 60 years after 1917, it took an average of 30 years to replace half of the 100 largest public companies. Between 1977 and 1998 it took an average of 12 years. Moreover, from 1980 to 2001 all of the net U.S. job growth was from firms less than five years old, while other firms actually lost jobs.[3]

Today's economy is r*ooted in information and new technologies*. While it is also true that information technologies have played a role in the economy since the invention of the telegraph, something happened in the 1990s when semiconductors, computers, software, and telecommunications became cheap enough, fast enough, and networked enough to become so ubiquitous as to power a surge in productivity growth. Indeed, information technology is now the key technology driving the economy, not just in the IT industry itself – which continues to see high-wage job growth – but also in the use of IT in virtually all sectors to boost productivity, quality, and innovation.[4]

Today's economy is *driven by innovation* – the development and adoption of new products, processes, and business models. Nations, states, regions, firms, and even individuals compete on their ability to accumulate, aggregate, and apply their assets in ways that create value in new ways for increasingly diverse customers all over the world. For example, as R&D is the key fuel of the engine of New Economy growth, it is not surprising that business-funded R&D has almost doubled from 1.19 percent of GDP in 1980 to 2.02 percent in 2002. Moreover, the number of patents issued has more than doubled since 1984, with over 185, 000 issued in 2004.

These fundamental changes have created an economy where the United States is being forced to compete on the basis of innovation, and more complex, capital, and knowledge-based production. In this environment, lower-cost developing nations now serve the role that lower-cost U.S. regions once did after WWII when they specialized in cost-based commodity production.

As production processes (in manufacturing or services) mature and are able to be conducted in lower-cost regions, they are now more likely to filter *out* to lower cost nations rather than filter *down* the urban hierarchy to lower cost places in the United States. In the old economy these establishments generally migrated from the high-cost North and Midwest to the low-cost South and Southwest. Now they migrate to Southeast Asia and other low cost regions. Indeed, this appears to be exactly what has happened in the last decade as the number of industrial manufacturing relocations and significant expansions has fallen from an average of 5,139 per year for 1995-2000 to 3,162 in 2005.[7] Many firms, in fact, go global early on, looking for global sourcing of the low-value, commoditized parts of the value chain even before the firm has fully matured.

As a result, in order to succeed in the new global economy, a growing share of regions can no longer rely on old economy strategies of relentlessly driving down costs and providing large incentives to attract cost-focused locationally mobile branch plants or offices. In the New Economy even the lowest cost regions will have a hard time competing for facilities producing commodity goods and services against nations whose wage and land costs are less than one-fifth of those in the United States. Rather, regions, even those that since World War II followed the low cost, branch plant path to success, must now look for competitive advantage in earlier-stage

product cycle activities. This can mean either fostering new entrepreneurial activities or helping existing firms innovate so that they don't become commodity producers searching for any number of interchangeable low cost locations. And to succeed in that process means developing the kinds of economic structure and assets suited for the New Economy.

ASSESSING YOUR STATE'S POSITION IN THE NEW ECONOMY

So how then does a state or region figure out how well it is positioned to compete and win in this New Economy? Most traditional state indicator exercises focus on old economy indicators, such as tax rates, utility costs, and other business climate factors. But the challenge now is not to be the lowest cost place for business, but the best place for business. This means being a place with knowledge workers, globally-linked firms, entrepreneurial dynamism, a solid IT infrastructure, and a foundation for innovation. In order to assess how well positioned states are to succeed in the New Economy, we developed the *2007 State New Economy Index* to examine the degree to which state economies are knowledge-based, globalized, entrepreneurial, IT-driven, and innovation based.[8]

So how then does a state or region figure out how well it is positioned to compete and win in this New Economy? Most traditional state indicator exercises focus on old economy indicators, such as tax rates, utility costs, and other business climate factors. But the challenge now is not to be the lowest cost place for business, but the best place for business.

The *Index* relies on 26 indicators divided into five categories that best capture what is new about the New Economy:

1) **Knowledge jobs.** Having a large share of knowledge jobs, that is jobs that require either college education or other kinds of higher skills, is a key to success. Indicators of this include employment of IT professionals outside the IT industry; jobs held by managers, professionals, and technicians; the educational attainment of the entire workforce; immigration of knowledge workers; employment in high value-added manufacturing sectors; and employment in high wage traded services.
2) **Globalization.** Global links lead to success, in part because firms that export pay more than those that don't. Indicators of globalization include the export orientation of manufacturing and services, foreign direct investment, and package exports.
3) **Economic dynamism.** Dynamic regional economies are more likely to succeed than more stable ones. Indicators of this include the number of fast-growing "gazelle" companies; the degree of job churning (which is a product of new business start-ups and existing business failures); the number of Deloitte Technology Fast 500 and Inc. 500 firms; the value of initial public stock offerings (IPOs) by companies; the number of entrepreneurs starting new businesses; and the number of individual inventor patents issued.
4) **Transformation to a digital economy.** In general, firms that adopt more IT are more successful than firms that don't and communities with more broadband are more successful than those with less. Indicators of digital economies include the percentage of population online; the number of Internet domain name registrations; technology in schools; the degree to which state and local governments use information technologies to deliver services; Internet and computer use by farmers; and residential and business access to broadband telecommunications.
5) **Technological innovation capacity.** Given that it is becoming more difficult for regions to compete on cost, they will need to compete more on innovation. Indicators of this include the number of jobs in technology-producing industries; the number of scientists and engineers in the workforce; the number of patents issued; industry investment in research and development; and venture capital activity.

In all cases, the report relies on the most recently published statistics available, but because of the delays in publishing federal statistics, the data may in some cases be several years old. In addition, data are reported to control for the size of the state, using factors such as the number of workers or total worker earnings as the denominator.

Globalization is bringing new challenges and opportunities.

THE RANKINGS

Table 2 shows the scores for the states. The highest possible score is 100. Moreover, each of the 26 indictors is weighted and the scores are summed to determine the overall rank.

The state farthest along the path to the New Economy is Massachusetts. Boasting a concentration of software, hardware, and biotech firms supported by world-class universities such as MIT and Harvard in the Route 128 region around Boston, Massachusetts survived the early 2000s downturn and has continued to thrive, enjoying the 4th highest increase in per-capita income. New Jersey and Maryland, states that ranked 5th and 6th respectively in 2002, increased their rankings and are now the second and third most New Economy states in the nation.

New Jersey's strong pharmaceutical industry, coupled with its high-tech agglomeration around Princeton and its advanced services sector in northern New Jersey, coupled with high levels of inward foreign direct investment help drive it to second place. Maryland scores high, in part because of the high concentration of knowledge workers, many employed in the suburbs of the District of Columbia and many in federal laboratory facilities or companies related to them. Washington state comes in at fourth, in part on its strength in software (in no small part due to Microsoft), but also because of the entrepreneurial hotbed of activity that has developed in the Puget Sound region and very strong use of digital technologies by all sectors.

These and the other top 10 New Economy states (California, Connecticut, Delaware, Virginia, Colorado, and New York) have more in common than just high-tech firms. They tend to have a high concentration of managers, professionals, and college-educated residents working in "knowledge jobs" (jobs that require at least a two-year degree). With one or two exceptions, their manufacturers tend to be more geared toward global markets, both in terms of export orientation and the amount of foreign direct investment.

All the top states also show above-average levels of entrepreneurship, even though some, like Massachusetts and Connecticut, are not growing rapidly in employment. Most are at the forefront of the IT and Internet revolutions, with a large share of their institutions and residents embracing the digital economy. In fact, the variable that is more closely correlated (0.87) with a high ranking is jobs in IT occupations outside the IT industry itself (e.g., network managers in banks or hospitals).

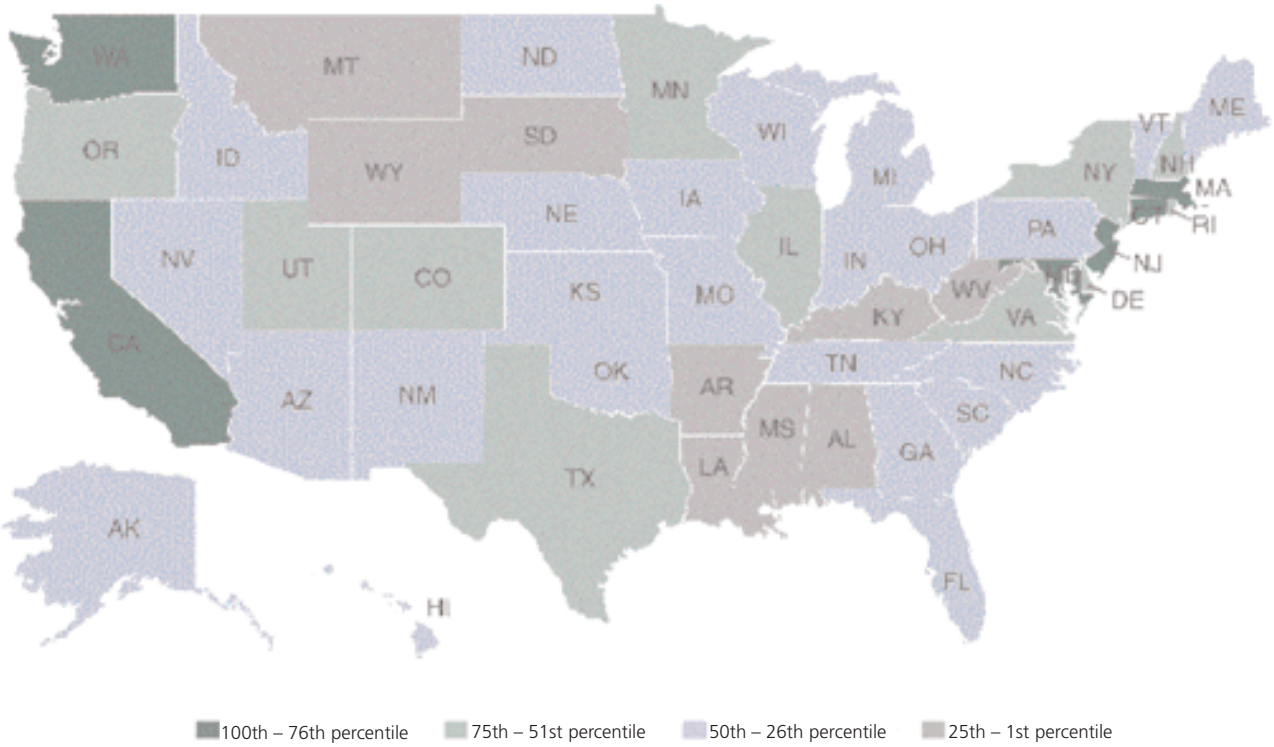
Most have a solid "innovation infrastructure" (such as high share of scientists and engineers and corporate R&D) that fosters and supports technological innovation. Many have high levels of domestic and foreign immigration of highly mobile, highly skilled knowledge workers seeking good employment opportunities and a good quality of life.

While top-ranking states tend to be richer (there is a strong and positive correlation of 0.78 between their

Table 2: State New Economy Index Rankings

2007 Rank	2007 Score	State
1	96.1	Massachusetts
2	86.4	New Jersey
3	85.0	Maryland
4	84.6	Washington
5	82.9	California
6	81.8	Connecticut
7	79.6	Delaware
8	79.5	Virginia
9	78.3	Colorado
10	77.4	New York
11	75.3	Minnesota
12	73.2	Utah
13	71.1	New Hampshire
14	68.6	Texas
15	68.6	Rhode Island
16	68.4	Illinois
17	66.8	Oregon
18	64.8	Georgia
19	64.7	Michigan
20	64.5	Vermont
21	63.6	Pennsylvania
22	63.2	Arizona
23	63.2	Florida
24	62.8	Idaho
25	62.4	Alaska
26	60.2	North Carolina
27	59.2	Nevada
28	59.0	Nebraska
29	57.8	Ohio
30	55.9	Wisconsin
31	55.8	Indiana
32	55.6	Maine
33	53.7	New Mexico
34	53.6	Kansas
35	53.5	Missouri
36	53.3	Tennessee
37	51.9	North Dakota
38	51.8	Iowa
39	51.5	South Carolina
40	51.4	Oklahoma
41	50.9	Hawaii
42	49.5	Montana
43	47.9	Wyoming
44	45.9	Louisiana
45	45.3	Kentucky
46	45.1	Alabama
47	44.7	Arkansas
48	43.8	South Dakota
49	36.5	Mississippi
50	35.6	West Virginia
	62.1	**United States**

Figure 1: 2007 State New Economy Index Scores



rankings and their per capita income), wealth is not a simple proxy for advancement toward the New Economy. Some states with higher per-capita incomes lag behind in their scores (for example, Alaska, Illinois, and Wyoming), while other states with lower incomes do relatively well (such as Texas and Utah).

The two states whose economies have lagged the most in making the transition to the New Economy are West Virginia and Mississippi. Other states with low scores include, in reverse order, South Dakota, Arkansas, Alabama, Kentucky, Louisiana, Wyoming, Montana, and Hawaii. Historically, the economies of many of these and other Southern and Plains states depended on natural resources or on mass production manufacturing (or tourism in the case of Hawaii), and relied on low costs rather than innovative capacity, to gain advantage. But innovative capacity (derived through universities, R&D investments, scientists and engineers, and entrepreneurial drive) is increasingly what drives competitive success in the New Economy.

While lower-ranking states face challenges, they can also take advantage of new opportunities. The IT revolution gives companies and individuals more geographical freedom, making it easier for businesses to relocate, or start up and grow in less densely populated states farther away from existing agglomerations of industry and commerce.

Moreover, metropolitan areas in many of the top states suffer from increasing costs (largely due to high land and housing costs) and near gridlock on their roads. Both factors will make locating in less congested metros, many in lower ranking states, more attractive.

Regionally, the New Economy has taken hold most strongly in the Northeast, the mid-Atlantic, the Mountain West, and the Pacific regions; 14 of the top 20 states are in these four regions. (The exceptions are Florida, Georgia, Illinois, Michigan, Minnesota, Texas, and Virginia.) In contrast, 15 of the 20 lowest ranking states are in the Midwest, Great Plains, and the South. Given some states' reputations as technology-based, New Economy states, their scores seem surprising at first.

For example, North Carolina and New Mexico rank 26th and 33rd, respectively, in spite of the fact that the region around Research Triangle Park boasts top universities, a highly educated workforce, cutting-edge technology companies, and global connections, while

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Albuquerque is home to leading national laboratories and an appealing quality of life. In both cases, however, many parts of the state outside these metropolitan regions are more rooted in the old economy – with more jobs in traditional manufacturing, agriculture, and lower-skilled services; a less educated workforce; and a less-developed innovation infrastructure. As these examples reveal, most state economies are in fact a composite of many regional economies that differ in the degree to which their economies are structured in accordance to New Economy factors.

DO THESE RANKINGS MATTER?

Of course, economic development officials will want to know if these scores actually matter. In other words, how closely do high scores correlate with economic growth? If simple job growth is their goal, then economic development officials can safely ignore these rankings. States that score higher appear to create jobs at only a slightly faster rate than lower ranking states. Between 1999 and 2005 there was only a modest positive correlation (0.10) between the rate of employment growth and New Economy scores. For example, Nevada led the rest of the nation in job growth, but ranked just 27th on the *Index*.

However, for economic development officials seeking not just more jobs, but better jobs, then these indicators are worth paying attention to. Higher New Economy scores are positively correlated with higher absolute growth in state per-capita incomes between 1999 and 2005 (0.44). This is in spite of the slowdown of 2001 which hit the most technology-intensive New Economy states the hardest.

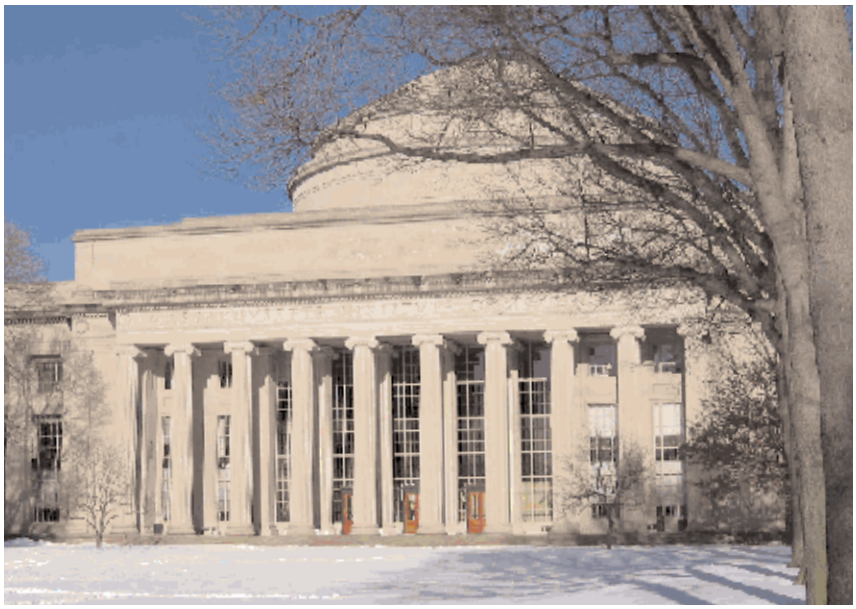
In many ways, these results are perhaps not too surprising. Most economic development officials might expect states like Massachusetts and California to be leaders in the New Economy. But there are a number of surprises in terms of where states rank on both individual indicators and overall.

To be sure, there are other paths to high income growth, at least in the shorter term. For example, Wyoming, which ranks 43rd, enjoyed the fastest absolute per-capita income growth between 1999 and 2005, largely due to increases in prices and demand for resource mining and oil and gas industries. While yielding impressive performance in the short term, this is not a winning strategy for the long run. As history has shown, such an undiversified approach leaves an economy at the mercy of world price fluctuations that bring busts as well as booms. On the other hand, states that embrace the New Economy can expect to sustain greater per-capita income growth for the foreseeable future, especially as competitive advantage for the nation will continue to be based on these new economy factors.

SURPRISES

In many ways, these results are perhaps not too surprising. Most economic development officials might expect states like Massachusetts and California to be leaders in the New Economy. But there are a number of surprises in terms of where states rank on both individual indicators and overall. For example, people might not think of New Jersey as a New Economy powerhouse, but it comes in second.

For individual indicators there are even more surprises. For example, Indiana ranks first on manufacturing value-added measured the percentage of a state's manufacturing workforce employed in sectors in which the value-added per production hour worked is above the sector's national average.[9] Almost half (48.7 percent) of its manufacturing workforce is in sectors that are more productive than the national average for that sector. This is important because high value added supports higher wages and strong competitiveness for the state's manufacturing sector.



MIT has helped Massachusetts be a New Economy leader.

With its image as a bucolic agricultural state, it's perhaps surprising that Vermont is the third most export-intensive state economy as measured by export sales per manufacturing and service worker. This is important because exporting has become more important as trade has become an integral part of the U.S. and world economies. Moreover, export industries are a source of higher incomes. On average, workers employed at

export-oriented manufacturing firms earn 9.1 percent more than workers at comparable non-exporting firms. In business services, workers at exporting firms earn an even larger premium, 12.9 percent more than their counterparts at comparable non-exporting firms.[10]

When it comes to fast growing "gazelle" companies (companies with annual sales revenue that has grown 20 percent or more for four straight years), many would expect "high-tech" leaders like Massachusetts, Washington, and California to top the charts. In fact, the two top states were Nebraska and Delaware, with Arkansas in 5th place. Something was going on in those states that led them to be hot-beds of fast growing entrepreneurial companies. In Delaware's case at least, it may have to do with the fact that the state developed several new seed and venture funds to spur gazelle growth.

The prevalence of new, rapidly growing firms – gazelles – is the sign of a dynamic and adaptive state economy. States that offer fertile ground for the entrepreneurial activity that spawns gazelles reap the harvest of robust job creation. Indeed, one study estimates that such gazelles (termed "high expectations entrepreneurs") are responsible for 80 percent of the jobs created by entrepreneurs.[11]

In the New Economy, skilled workers using advanced technology is the key to success.

Likewise, when it comes to broadband connections, few would think that our northernmost state, Alaska, would top the charts, with Minnesota at 4th and Wyoming 5th. Perhaps it's no coincidence that the coldest nations (e.g., Finland, Iceland, Sweden), like our coldest states, are among the leaders in broadband access. Being online beats being outside, at least in January. In the new digital economy, having a digitally-savvy population and business community, connected to broadband communications is an important factor for success. While in 2000, 46 percent of adults were online by 2006, this number had grown to 73 percent.[12]

Idaho, a state best known perhaps by people outside for its potatoes, in fact should be known for its patents. The state can boast the most patents per 1,000 workers, more than double the next highest state, Colorado. The number of patents issued is a key indicator of the capacity of firms to develop new products that will determine their competitive advantage and ability to pay higher wages.

Finally, when it comes to the leaders in R&D, few would think of Delaware and Rhode Island. Yet, the two smallest states are also the two biggest when it comes to the amount of industry-performed research and development (controlling for the kinds of industry in each state). Delaware, with its high-tech chemical firms is number one, and Rhode Island may score well because of its defense electronics and biotechnology firms and the fact that it instituted the nation's most generous R&D tax credit several years ago. Not only are R&D jobs very high paying, but they lead to other technology-related jobs being created.

CONCLUSION

Perhaps the most distinctive feature of the New Economy is its relentless levels of structural economic change. The challenges facing states in a few years could well be different than those today. But notwithstanding this, the keys to success in the New Economy now and into the future appear clear: supporting a knowledge infrastructure – world class education and training; spurring innovation – indirectly through universities and directly by helping companies; and encouraging entrepreneurship.

In the past decade, a new practice of economic development focused on these three building blocks has emerged, at least at the level of best practice, if not at the level of widespread practice. The challenge for states will be to adopt and deepen these best practices and continue to

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generate new economy policy innovations and drive the kinds of institutional changes needed to implement them. And it's this last challenge that is the key.

Success in the New Economy requires that a whole array of institutions – universities, school boards, firms, local governments, and economic development agencies – work in new and often uncomfortable ways. At the end of the day, this is a challenge of leadership. States with leaders who challenge their institutions and businesses and who follow through with bold new policies focused on innovation, learning, and constant adaptation – will be the ones that succeed and prosper.

ENDNOTES

1 U.S. Bureau of Labor Statistics. <www.bls.gov>.

2 Based on currency purchasing-power-parity measurement.

3 John Haltiwanger, "Entrepreneurship and Job Growth," (cited in *Competitiveness Index: Where America Stands*, Council on Competitiveness, 14 Nov. 2006: 76).

4 Robert D. Atkinson and Andrew McKay, "Digital Prosperity: Understanding the Economic Impact of the IT Revolution," (Washington, DC: The Information Technology and Innovation Foundation, 2007).

5 The "old economy" refers to the economy in place from after World War II until the mid-1970s when productivity growth slowed down significantly. And while the descriptors here are stylized, they are intended to reflect overall factors in each economic period. Source: Atkinson, op cit., (2004).

6 An intrapreneur is someone working for a large organization that is able to be entrepreneurial within that organization.

7 "Year-to-Date New Plant Report," (Conway Data, Inc, 1991-2005).

8 The report builds off two earlier reports (the *1999 State New Economy Index* and the *2002 State New Economy Index*) written by one of the authors when he was with the Progressive Policy Institute. Robert D. Atkinson, The *2002 State New Economy Index* (Washington, D.C.: Progressive Policy Institute, 2002). <www.neweconomyindex.org>.

9 Nationally, each NAICS three and four digit manufacturing sector's value-added was divided by the number of production hours worked to obtain an average value-added per production hour worked. The same was done at the state level, and the state and national figures were compared for each sector in each state. The number of employees in those state sectors that exceeded the national sector average for value-added per production hour worked by at least 10 percent were combined. These were then calculated as a share of the state's total manufacturing employment to obtain each state's final score.

10 J. Bradford Jensen, "Business Service Exporters," *Peterson Institute Working Paper*, 2007.

11 Erkko Autio, "High-Expectation Entrepreneurship 2005," *Global Entrepreneurship Monitor*, 2005. <http://www.gemconsortium.org/document.asp?id=444>.

12 Pew Internet & American Life Project, "Internet Adoption: Usage Over Time," 2006. <www.pewinternet.org/trends.asp#adoption>.