The 2007 State New Economy Index

Benchmarking Economic Transformation In The States

Ewing Marion Kauffman Foundation

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Ewing Marion KAUFFMAN Foundation

www.kauffman.org

4801 Rockhill Road
Kansas City, MO 64110

Phone: (816) 932-1000

The Information Technology & Innovation Foundation ITIF

www.innovationpolicy.org

1250 I Street, NW • Suite 200
Washington, DC 20005

mail@itif.org
Phone: (202) 449-1351
Fax: (202) 638-4922

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Benchmarking Economic Transformation in the States

Robert D. Atkinson and Daniel K. Correa

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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

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 (IT) revolution was transforming our world, creating a New Economy, ending the business cycle, and banishing scarcity. Times were good. Yet, just a few short years later, the "dot-bomb" implosion, the NASDAQ collapse, and recession of 2001 rapidly transformed exhilaration into pessimism, leading many to dismiss notions of a New Economy transformation. Indeed, many have gone so far as to claim that the events of the last few years prove that the New Economy was a flash in the pan, or a myth spun by an overly imaginative media.

Yet, the New Economy was never just about high-flying dot-com companies, a soaring stock market or the "next new thing." Rather, today's transformation to a New Economy is equivalent in scope and depth to the emergence of the factory economy in the 1890s and the mass production, corporate economy in the 1940s and 1950s. As we pass through these ground swells that regularly but infrequently reshape the economy (and society), there are sure to be occasional bumps along the way. These are simply negative phases within longer growth periods.[1] It would be a mistake, therefore, for state economic development officials to dismiss the magnitude of the structural changes generated by the New Economy that continue to transform their economies.

So what exactly is the New Economy? The term refers to a set of qualitative and quantitative changes that in the last 15 years have transformed the structure, functioning and rules of the economy (see Table 1). 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.

Today's economy is *knowledge dependent*. Of course, managers and "knowledge workers" have always been part of the economy, but by the 1990s, they had become 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.[2] In contrast, about one in seven workers is employed as a production worker in manufacturing, and even there, knowledge and continual skills enhancement is becoming more important.

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, as more goods and services are traded, and more of the production process is interconnected in a global supply web. Since 1980, global trade has grown 2.5 times faster than global gross domestic product (GDP). World exports are now at $12.5 trillion, nearly 20 percent of world GDP.[3]

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, the center of gravity seemed to shift to entrepreneurial activity after the 1990s. At the same time, the underlying operation of the economy accelerated to a new speed and became 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,

Table 1: The New and Old Economies[12]

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 between firms	Go it alone	Collaborative
Skills	Job-specific	Broad and changing
Workforce	Organization Man	"Intrapreneur"[13]
Nature of employment	Secure	Risky

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 older firms actually lost jobs.[4]

Today's economy is *rooted in information technology*. While it is also true that information technology has 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 (see Box 1). 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.[5]

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

BOX 1: WHAT INFORMATION TECHNOLOGY BUST?

To listen to the naysayers, one would think that the IT revolution was still-born, with the dot-com implosion and the crash of the NASDAQ representing the justified culmination of the New Economy fad. Of course, reality was bound to disappoint given the sky-high expectations. Kevin Kelly, editor of *Wired Magazine*, opined, "The network economy will unleash opportunities on a scale never seen before on Earth."[6] One enthusiast marveled, "The Internet should be as important as the invention of cities … The arrival of the network economy, the gurus say, should be like the transition from an agricultural economy to an industrial one."[7] Even business leaders succumbed to the hype. General Electric CEO Jack Welch proclaimed, "Commerce in the next decade will change more than it's changed in the last hundred years." Any company not embracing the Internet was, according to popular wisdom, doomed to extinction.

When epochal transformation is the bar, reality is bound to disappoint. Yet while today's digital economy may not have lived up to the most extreme hype, it's actually closer to the hype than the gloom. To the surprise of many, the IT revolution exceeded even the heady expectations of the late 1990s. In 1997, IT forecasting firm Forrester Research estimated that business-to-business (B2B) e-commerce would total $186 billion by 2001. In fact, it was $715 billion. In 1999, *Business 2.0* projected that B2B e-commerce would grow from $131 billion to $842 billion in 2003, while business to consumer (B2C) was estimated to reach $97 billion.[8] In fact, B2B e-commerce was worth $1.8 trillion and B2C, $143 billion. By early 2004, two-thirds of Internet users had purchased a product online.[9] In 2005, there were more than 20,000 computer networks and close to a billion users around the world.[10]

Even the take-up of broadband telecommunications has been a more optimistic story than the pessimists would have us believe. In 1998, it was projected that 9 million American homes would subscribe to broadband. In fact, in 2003, between 20 and 25 million households had subscribed.

Yet the interruption in digital transformation experienced in the early 2000s is actually the norm. As technology historian Carlota Perez documented, technology revolutions start with what she calls the "installation phase" when "new technologies erupt in a maturing economy and advance like a bulldozer disrupting the established fabric and articulating new industrial networks… At the beginning of that period, the revolution is a small fact and a big promise; at the end, the new paradigm is a significant force…ready to serve as a propeller of widespread growth."[11] She goes on to argue that the second half of these technological revolutions, the "deployment period," is when the fabric of the economy is rewoven and reshaped by the new technology system and when the technology becomes normal best practice. However, the turning point between the two phases usually is a critical crossroads, often resulting in an economic downturn.

This phenomenon is exactly what we have seen in the last 15 to 20 years. As the installation period ended in 2000, it did indeed represent a crossroads, when it became clear that some business models would thrive and others die. However, now, during the deployment period, IT is well on its way to reshaping the economy and driving growth. In short, while the IT revolution may not have lived up to the most extreme hype of the late 1990s, at least in terms of its penetration into the economy and society, it has more than fulfilled its promise. And the next decade promises as much progress, if not more, as the last.

their assets to create value in new ways for increasingly diverse customers all over the world. For example, as research and development (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 almost doubled since 1984, with more than 166,650 issued in 2002.

As the New Economy enters adolescence, it will continue to restructure and reshape global and national economies, as well as those of the 50 states. This report uses 26 indicators to assess that process, and in particular to measure the differences in the extent to which state economies are structured and operate according to the tenets of the New Economy. In other words, it examines the degree to which state economies are knowledge-based, globalized, entrepreneurial, IT-driven, and innovation-based. With these indicators as a frame of reference, the report then outlines a state-level public policy framework aimed at boosting the incomes of all state residents. 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.[14]

OPPORTUNITIES FOR GROWTH

Economies – national, state, or local – have two principal ways to grow over the medium and longer term. They can get bigger by increasing the number of employed workers, or they can get more productive, increasing the value each worker produces.[15] Given that the United States has exceeded the 300 million mark in population and that employment continues to grow, it is highly likely that most state economies will continue to expand. Employment growth, however, is slower today than it was a decade ago and is likely to remain slower as baby boomers retire and women are no longer newly entering the workforce in large numbers. In fact, from the mid-1970s to the mid-1990s, jobs grew around 1.9 million per year. From the mid-1990s to 2006, that rate was only around 1.6 million per year.

It is also noteworthy that employment growth is uneven, generally following patterns of the last several decades with most Southern and Western states growing more rapidly than most Midwestern and Northeastern states (see Figure 1). But, as long as states are not losing workers, the impact of slow employment growth has little effect on the most important measure of state economic well-being: per capita income. Indeed, Nevada, the state with the fastest employment growth from 1999 to 2005 experienced below-average growth in per capita income (see Figure 2). And while the correlation between state employment growth and per capita income growth is positive, it is quite modest (0.19).

Figure 1: State Employment Growth 1999-2005

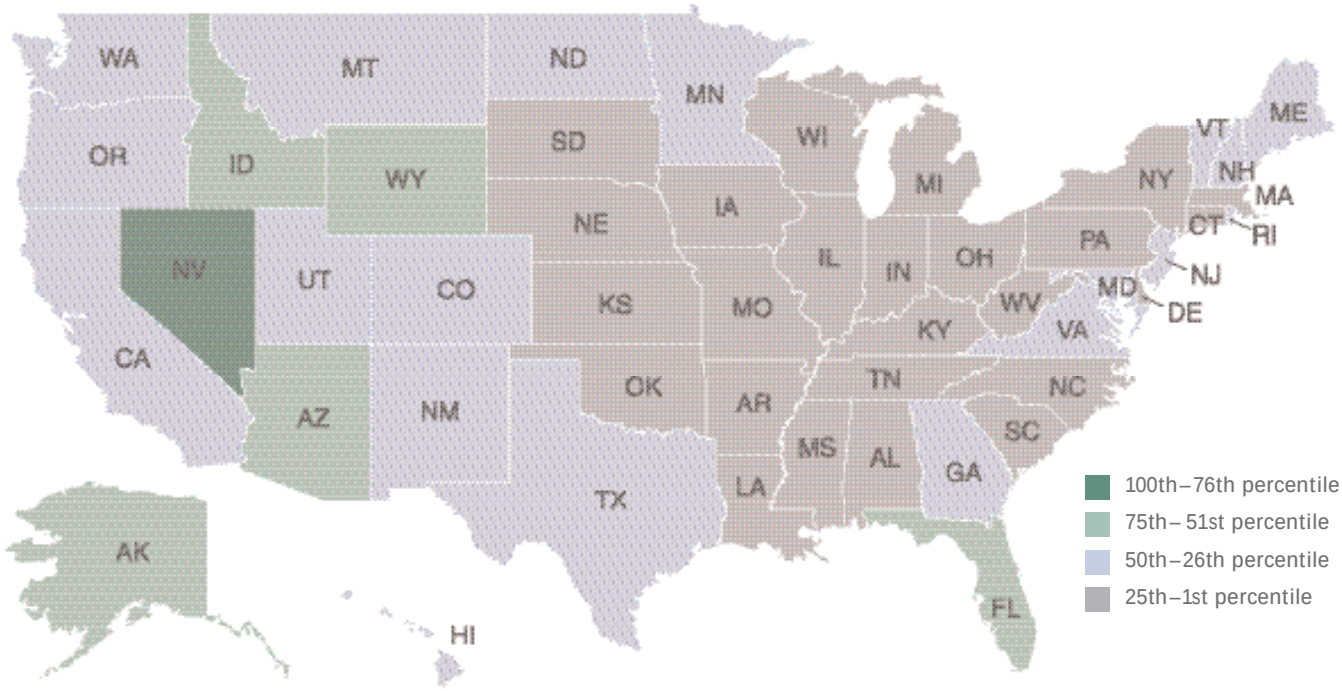
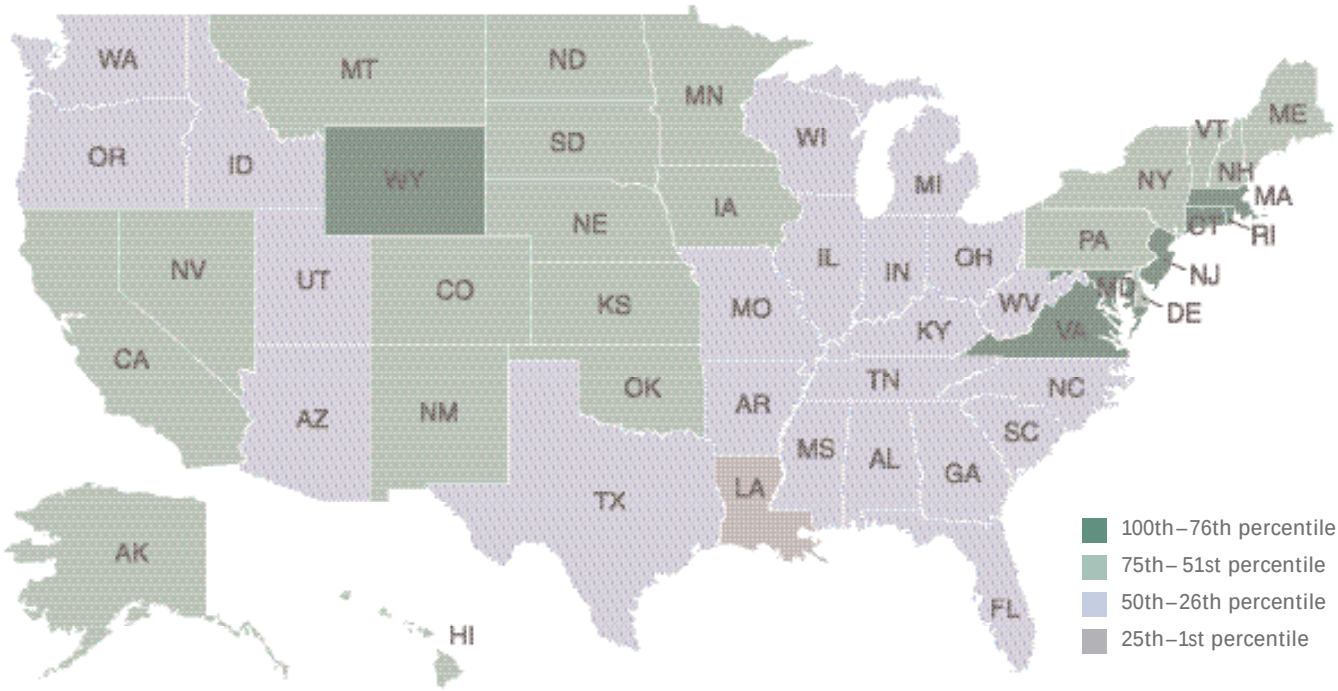


Figure 2: State Per Capita Income Growth 1999-2005



Even with the robust employment growth of the last few decades, some argue, incorrectly, that the aging of the baby boom generation will lead to significant labor shortages and stagnant income growth.[16] In fact, the demand for workers is a function of demand for goods and services, which in turn is largely a function of the supply of workers. If a smaller share of the population is working, there will be relatively less demand for goods and services. Retiring baby boomers will be consuming less in retirement, and as such, generating less demand for labor than they did as full-time workers. Moreover, even if retirees were not to consume relatively less, by definition, workers would have to, since a growing share of national income would go to support retirees (e.g., Social Security and other retirement income). Put these factors together and it is clear that demand for goods and services – hence demand for labor – will not and cannot grow any faster than the supply of labor. This is not to say that the nation or individual states could not see particular skill shortages as some occupations grow faster than the number of workers with these needed skills. But an overall shortage of workers is simply never possible.[17]

While the graying of America will not lead to labor shortages, it will lead to population migration. Currently, 35 million Americans are between 50 and 59 years old and planning retirement, up from 21 million in 1990. And because retirees are not tied to particular places through employment, they are more geographically mobile than workers. As a result, retirees with independent sources of income at levels above the national average can boost regional growth. Some places, in fact, will flourish based on their ability to capture the accumulated wealth of the boomer generation.

State economies can also grow through higher productivity. Productivity growth – the increase in the amount of output produced by workers per a given unit of effort – is in fact the most important measure and determinant of economic performance for the nation. The United States enjoys one of the highest standards of living because economic output per person grew eight-fold in the 20th century.[18] If productivity grows one percent faster each year for the next 40 years than it did in the 1980s, and if that growth is distributed relatively evenly, the average American will earn $41,000 more per year than he or she would have otherwise (in real 2006 dollars).[19] With this increased income, Americans could afford better housing, universal high-quality health care, more college education, and many other benefits. Moreover, the increased output would generate higher tax revenues, letting either taxes be cut or public expenditures be increased, or both.

Productivity of a particular economy (nation, state or sub-state region) can increase in two ways: Existing firms can become more productive, usually by using new technologies or improving the skills of their workers, or low-productivity firms can be replaced by high-productivity firms. For example, a state could lose 50 jobs in a call center (which normally has low productivity) but replace them with 50 jobs in a software firm (which normally has high productivity). Across-the-board productivity growth (the growth effect) and shifts in the mix of establishments toward more productive ones (the mix effect) will both contribute to an increase in a state's productivity and average incomes.

So which strategy – growth or mix – is the best path to higher per capita incomes? The answer depends on the size of the economy. The larger the economy, the more important the growth effect is, while the smaller the economy, the less important it is. To see why, consider an automobile factory in a small city. If it installs robotic technology and raises productivity (the growth effect), a large share of the benefits will flow to the firm's customers in the form of lower prices. In contrast, if the city attracts or grows a high-productivity firm to replace a lower-productivity one that moved away (the mix effect), most of the benefits will accrue to the residents in the form of higher wages. This means that productivity growth across the board, rather than a shift to higher value-added sectors, will be more important as a strategy for becoming wealthy in larger regions than in smaller areas. But even for smaller states, across-the-board productivity gains are still an important way to become richer.[20]

To the extent that states have cared about raising productivity (as opposed to simply creating more jobs, regardless of their wage levels), most have focused on the latter strategy by trying to attract higher-wage firms to their states. Yet, as Porter found in his analysis of traded clusters in sub-state regions, raising the productivity of all clusters has about the same effect on income as shifting to higher productivity clusters.[21] In other words, a strategy of raising productivity in existing firms is just as effective as attracting or growing higher-productivity industries. Moreover, raising the productivity of non-traded firms (e.g., firms in industries like retail, health care, local government) whose output is consumed almost entirely by the region's residents can have even larger benefits to the region. Most of the benefits will go to area residents in the form of lower prices for consumers and higher wages for workers.

In the 1980s and early 1990s, many state economies suffered, largely because U.S. productivity growth rates fell. If a state wanted to grow, all too often it had to be at the expense of its neighbors as it sought to attract or hold onto higher value-added jobs. Fortunately, since the mid-1990s, productivity growth has rebounded to the levels enjoyed in the heyday of the old economy of the 1950s and 1960s. Indeed, the increase in the productivity growth of the mid-to-late-1990s means that the economy produces $1.9 trillion more every year than it would otherwise.[22] As a result, the average state economy is, in fact, $38 billion larger today than it would have been had productivity growth not accelerated. With higher productivity, it is easier for state economies and per capita incomes to grow.

As productivity growth continued through the early 2000s and even increased, evidence mounted that the information technology revolution was behind this unanticipated economic boom. Indeed, economists generally agree that it is the IT revolution that is transforming virtually all industries and driving increased productivity.[23] IT was, in fact, responsible for all of the increase in labor productivity growth from 1995 to 2002.[24] By automating a large share of functions involving the routine processing of information, including face-to-face, phone, and paper transactions, the digital economy promises to continue to be the major engine of productivity growth.

Moreover, it appears that the "IT engine" is not likely to run out of gas anytime soon. The core technologies (memory, processors, storage, sensors, displays, and communication) continue to get better, faster, cheaper, and easier to use, enabling new applications to be introduced on a regular basis.[25] The adoption of digital technologies continues to grow. The number of households subscribing to broadband increased from 35.3 million in 2004 to 52.2 million in 2006, and it is projected to increase to 90 million by 2010, encompassing 71 percent of households.[26] Finally, sectors like health care, education, transportation, government, real estate and others are at the early stages of digital transformation, and as they transform, productivity promises to continue to grow. As a result, it is reasonable for states to expect productivity to continue to grow at relatively robust rates for the foreseeable future.

THE NEW GLOBAL COMPETITIVENESS CHALLENGE

If the good news is that the IT revolution is likely to continue to drive productivity growth, the bad news is that global competition is making it harder for states to retain, much less grow, high value-added, high-wage establishments. The trade deficit represents the most visible manifestation of this challenge. At 6.4 percent of GDP in 2005, the current account

deficit is at an all-time high, in absolute terms as well as relative to the size of our economy. The traditional U.S. trade surplus in agricultural products is nearing zero and in high-technology products it has turned negative, while our surplus in services trade is small and only holding relatively steady.

Three factors drive this new global competitiveness challenge. First, technology has made it possible for more work to be done at a distance. IT-enabled supply chains mean that companies are able to source products from around the world. Moreover, an increasing share of work can be digitized or conducted by telephone, so that a place like Bangalore, India is now functionally as close as the neighborhood bank or insurance office for routine activities that do not require face-to-face interaction. Second, other nations have realized the opportunities of attracting internationally mobile investment. Many developing nations have established the infrastructure, skilled workforce and business climate to become attractive locations for this work. Indeed, many foreign nations, and their sub-national governmental units, are implementing exactly the same kinds of economic strategies that states have long practiced (see Box 2). Finally, developing nations' efforts are greatly aided not only by wage rates that are on average 20 percent of U.S. rates,[27] but often by a plethora of unfair trade practices, including high tariffs, artificially low exchange rates, and a host of non-tariff barriers.[28]

Over the long term, the rise of Asian economies and other technology-focused nations poses a threat to U.S. manufacturing and technology-based industries. Since the end of World War II, the United States has been the world leader in innovation and high value-added production. But now a growing share of that activity is at play in international competition. This challenge is particularly acute in manufacturing. While some deny that manufacturing has been weakened by foreign competition, manufacturing's share of GDP (omitting computers) has declined from 13 percent in 1993 to 11.4 percent in 2003, at a time when the goods trade deficit has increased 3.6 percentage points as a share of GDP.[31]

This challenge is not confined to manufacturing. It is now possible to provide information-based services at a distance,

BOX 2: INDIAN STATE ECONOMIC DEVELOPMENT EFFORTS

Other nations have not been sitting idly by, hoping multinational companies will select them for investment. Many countries have rejected earlier strategies of looking inward and closing their borders and instead have been actively employing industrial strategies to attract industries. For example, the Indian state of Andhra Pradesh and its capital city, Hyderabad, have emerged as leading sites for IT-enabled service work. In the 1990s, the state developed a strategy to attract these jobs. A key step was the creation of the Agency for Promoting and Facilitating Investment in Remote Services and Technology (APFirst) organization. APFirst's mission is "to make Andhra Pradesh the world's preferred Business Process Outsourcing/Information Technology Enabled Services destination."

Andhra Pradesh was the first state in India to provide free right-of-way land for laying fiber optic cable, something few state and local governments in the United States have done.[29] The city of Hyderabad donated a 55,000 square-foot campus-style office facility to encourage IT firms to locate there.[30] The park boasts uninterrupted power, thanks partly to diesel generator back-up. They also provided direct financial incentives. In 1999, the state created a new IT incentive policy that provided 25 percent discounts for electric power used by IT firms, exempted software from sales taxes, and provided a rebate on the cost of land up to 20,000 rupees per job. Leaders have also focused on making sure that Hyderabad has a supply of trained workers. In 2001, the Indian School of Business located in the city. The state also created the Indian Institute of Information Technology to train workers for the burgeoning industry. In addition, it launched an Information Technology Enabled Services training institute. The training program has two tiers. The first tier focuses on improving students' basic English language capability, and the second tier concentrates on specialized skills for IT-enabled services, with elective courses in areas such as HR training, payroll processing, and insurance processing.

transmitted over high-speed fiber optic cables. Moreover, companies are shifting R&D overseas. Between 1998 and 2003, investment in R&D by U.S. majority-owned affiliates increased twice as fast overseas as it did at home (52 percent vs 26 percent).[32] In the last decade, the share of U.S. company R&D sites in the United States declined from 59 percent to 52 percent, while the share in China and India increased from 8 to 18 percent.[33] And while there were several motivations for firms to shift R&D offshore, cost reduction was the most important driver.[34]

The loss of R&D and advanced manufacturing capabilities, like aerospace, autos, machine tools, and semiconductors, is not the same as the loss of functions such as call centers or commodity textile production. The former are functions which, if lost, would be relatively difficult to reproduce, even if the dollar fell enough to make their production in the United States cost competitive. The reason is that there are significant first mover advantages, including economies of scale and network effects and deep and sophisticated knowledge requirements, which would make it difficult to resurrect such high value-added production.[35]

The result is that the same forces that are driving the New Economy – new industries and occupations, globalization, the information technology revolution, competition and dynamism, and innovation – are also driving a reordering of the economic geography. The last time the United States underwent a major economic transformation, after World War II, there was a similar reordering as regional labor, capital and consumer markets transformed into national ones. That "new economy" of the 1950s and 60s faced its own "globalization" challenge, but companies were not moving to low-cost Southeast Asia, they were moving to low-cost Southeastern United States. The completion of the Interstate Highway System and the emergence of jet travel, coupled with the mass adoption of air conditioning, electrification, and telephony, opened up the low-wage South as a viable branch plant location. Like today, there were large income differentials, making relocation to the South an attractive way to cut costs.[36] As a result, Northern industries flocked south, leaving behind shuttered factories, devastated communities and unemployed workers. For example, the Northeast's share of textile employment fell from 40 percent in 1950 to 22 percent in 1970, while New York and Pennsylvania's share of apparel employment fell from 47 percent to 24 percent. Then, as now, low-wage regions established economic development programs and offered substantial incentives to lure industry inside their borders.

In many ways the United States today is experiencing a global transition that mirrors the regional transition the country experienced in the 1960s. Then, parts of the Northeast and Midwest were able to adapt and reinvent their economic bases around higher value-added goods and services. For example, over the course of several decades, the Boston region shifted out of textiles, leather and routine metalworking into higher-wage defense, electronics and financial services industries. For a variety of reasons, other regions, like upstate New York and parts of Pennsylvania, could never fully make this shift, and as a result, suffered relatively slow economic growth. As economic transformation once again leads to a dramatic expansion in the effective size of the economy – this time on a global scale – the key question is which path the United States will follow: that of Boston or upstate New York? The former implies moving aggressively into next-generation industries, including advanced IT, robotics, nanotechnology, biotechnology, and high-level business services, while at the same time maintaining a smaller share of highly efficient and competitive traditional industries. The latter implies sticking with our existing economic base at the risk of slow overall growth and even slower income growth. The path we follow will depend, in part, on the strategies that states and the federal government adopt, and how aggressively they implement them. Developing and implementing new strategies that build on our considerable strengths in the global technology and knowledge-based industries is critical. So, too, is remedying key weaknesses. The following statistics point to these challenges:

- Declining federal support for research outside the life sciences. While total investment in R&D as a share of GDP fell in the United States from 1992 to 2002, it increased in most nations, including Japan (15%), Ireland (24%), Canada (33%), Korea (51%), Sweden (57%), China (66%, and Israel (101%).

- Declining share of students graduating with science and technology degrees. The U.S. ranks just 29th of 109 countries in the percentage of 24-year-olds with a math or science degree.[37] While Americans (citizens and permanent residents) are getting graduate degrees at an all-time high (non-science and engineering degrees increased by 64 percent between 1985 and 2002), the increase in graduate degrees in science, technology, engineering and math fields has been minimal (14 percent) over the same period.[38]

- Poor student performance in grades K-12, and slippage in higher education. Only about half of high

school graduates have the reading skills they need to succeed in college, a rate that has not changed in ten years.[39] Among 41 nations, the United States ranked 24th in math performance among 15-year-olds.[40] Moreover, notwithstanding the widely-held view that American higher education is the best in the world, there is evidence that the performance of colleges and universities in educating students has not kept up with the demands of the global economy.[41] Strikingly, among recent graduates of four-year colleges, just 34, 38 and 40 percent were proficient in prose, document, and quantitative literacy, respectively.[42]

- **Weakening national incentives for innovation.** In 1990, the United States enjoyed the distinction of having the world's most generous tax treatment for research and development. However, the generosity of the credit has been whittled away over the years, while other nations have forged ahead. By 2004, the U.S. had dropped to the 17th most generous.[43] As a result, it is not surprising that corporate-funded R&D as a share of GDP fell in the United States by 7 percent between 1999 and 2003, while it grew 3 percent in Europe and 9 percent in Japan.[44]

- Lack of a national strategy designed to explicitly win in global competition for high value-added production.

NEW GLOBAL ECONOMY, NEW ECONOMIC STRATEGIES

The dramatic expansion of the relevant market for most goods and the growing share of traded services have not only led to the rise of new and robust competitors; they have required a new sort of economic development policies that differ substantially from those practiced by most places since World War II. In that old economy, relatively few places – more expensive, larger metropolitan areas, many of them in the Northeast, Midwest and West – served as the "incubators" of the next waves of economic activity. These entrepreneurial hubs were responsible for the lion's share of firm start-ups and innovation. In contrast, smaller cities, rural areas, and many metropolitan areas in the South and Plains states specialized in more commodity-based, price-sensitive production. Much of that production had filtered down from more costly metropolitan areas as production processes matured and no longer needed to be located in information-rich, larger agglomerations.

Indeed, regional product cycle theory has long held that larger and usually more expensive core regions serve as the seedbeds of new industries, products, and services, essentially specializing in production at the early stage of the product cycle.[45] As production processes and products and services mature, facilities no longer need to be in the kinds of innovative, agglomeration-rich environments where they started. Instead, firms are able to move these functions to lower cost areas with less skilled labor. Then, these entrepreneurial regions develop the "next new thing." As a result of this recurring process of economic growth, relocation and reinvention, regions specialized in particular phases of the production process.

In the New Economy, however, this spatial division of labor between higher-cost, innovation-based regions and lower-cost, more commodity-based regions is being recast. Now, a much larger share of the U.S. economy is being forced to become a region that competes on the basis of innovation and more complex production, with lower-cost developing nations serving the role that lower-cost U.S. regions once served of specializing in cost-based commodity production. As a production process (in manufacturing or services) matures and is able to be conducted in lower-cost regions, it is 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. Indeed, this appears to be exactly what has happened in the last two decades in the U.S. as the number of industrial manufacturing relocations and significant expansions has fallen from an average of 5,139 per year between 1995 and 2000 to 3,162 in 2005.[46] Many firms, in fact, go global early on, and are looking for global sourcing of the low-value, commoditized parts of the value chain even before the firm has fully matured.

In order to succeed in the new global economy, then, a growing share of regions can no longer rely on old economy strategies of relentlessly driving down costs and providing large incentives to attract locationally mobile branch plants or offices. Even low-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 followed the low-cost, branch plant path to success since World War II, must now look for competitive advantage in earlier-stage product cycle activities. This strategy can mean either fostering new entrepreneurial activities or helping existing firms innovate so that they do not become commodity producers searching for any number of interchangeable low-cost locations. In short, regions need to be places where

existing firms can become more productive and innovative and new firms can emerge and thrive.

As a result, the last section of this report outlines a progressive, innovation-oriented public policy framework designed to foster success in the new global economy. It discusses the following nine key strategies that states can employ:

1. Align Incentives behind Innovation Economy Fundamentals
2. Co-Invest in an Innovation Infrastructure
3. Co-Invest in the Skills of the Workforce
4. Cultivate Entrepreneurship
5. Support Industry Clusters
6. Reduce Business Costs without Reducing the Standard of Living
7. Boost Productivity
8. Reorganize Economic Development Efforts
9. Enlist Federal Help

States that focus their policy efforts in these areas will be well-positioned to experience strong growth, particularly in per capita incomes. And that is the true objective. Developing a vibrant New Economy is not an end in itself; it is the means to advance larger, progressive goals: higher incomes, new economic opportunities, more individual choice and freedom, greater dignity and autonomy for working Americans, and stronger communities.

THE INDICATORS

OVERVIEW AND METHODOLOGY

The *2007 State New Economy Index* builds on the *2002 State New Economy Index*, using most of the indicators contained in that report. In our continuing effort to measure the New Economy better, the *2007 Index* also includes eight new indicators, many of which take advantage of newly available data. Several of these indicators assess entrepreneurial activity. The *Index* measures the number of entrepreneurs who start new companies, the number of patents issued to independent inventors, and the number of firms that are among the fastest growing in the nation, as measured by the Deloitte Fast 500 and the Inc. 500. To assess manufacturing competitiveness, a new indicator measures the value-added of a state's manufacturing sectors. To highlight the increased significance of the service economy, service exports have been added to the manufacturing exports indicator, and a new indicator tracks employment in high-wage services that are traded outside a region's economy. To capture growing global trends more accurately, the *Index* also measures the average education level of immigrants and the number of package exports.

Like the *2002 Index*, the report controls for a state's industry sector mix in variables that measure company behavior (R&D, exports, patents, manufacturing value-added). Holding the industry mix constant is important because some industries export, patent, spend more on R&D, or have higher value-added than others by their nature. For example, without controlling for industry mix, Washington state would score very high in manufacturing exports because its aviation sector (e.g. Boeing) is so large, and exports are a large share of that industry's output. To present a more accurate measure of the degree to which companies in a state, irrespective of the industry they are in, export, invest in R&D, or patent, these three indicators account for the state's industrial composition.[47] Similarly, manufacturing value-added is measured on a sector-by-sector basis, ensuring that a state's companies are compared to the nationwide performance of firms in the same industry.

Because the 1999, 2002 and 2007 reports use different indicators and methodologies, the total scores are not necessarily compatible. Therefore, a state's movement to a higher or lower overall rank between the years does not necessarily reflect changes in its economy. However, the 2002 overall scores have been revised to reduce methodological differences with the 2007 data.

The 26 indicators are divided into 5 categories that best capture what is new about the New Economy:

1) Knowledge jobs. Indicators measure 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. Indicators measure the export orientation of manufacturing and services; foreign direct investment; and package exports.

3) Economic dynamism. Indicators measure 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. Indicators measure 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. Indicators measure 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 the data may in some cases be several years old due to the delays in publishing federal statistics. In all cases, 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.

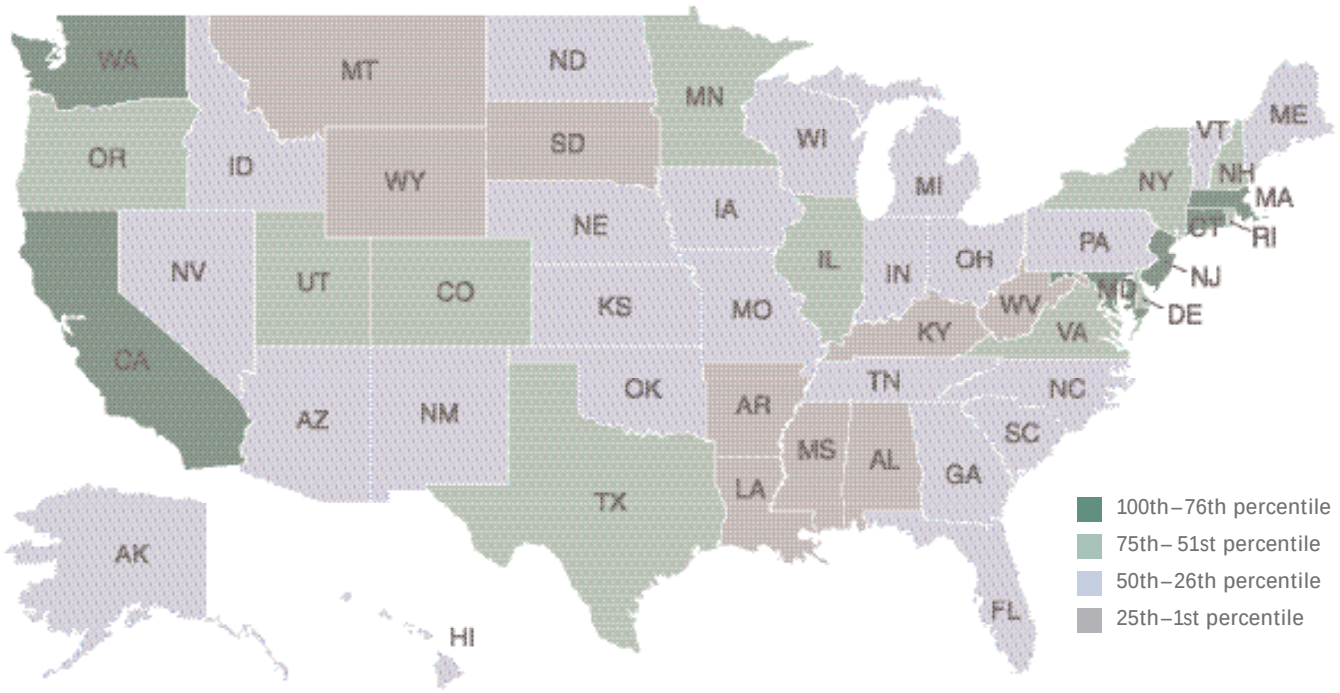
Scores in each indicator are calculated as follows: In order to measure the magnitude of the differences between the states instead of just their rank from one to fifty, raw scores are based on standard deviations from the mean. Therefore, on average for most indicators, approximately half the states initially have negative scores (below the national mean) and approximately half have positive scores. The scores are then equally adjusted (ten is added to each of the five indicator category totals) to ensure that all are positive.

In the calculation of the five indicator category totals (e.g., Globalization, Economic Dynamism, etc.) and the overall New Economy scores, the indicators are weighted both according to their relative importance and so that closely correlated indicators (for example, patents, R&D spending, and high-tech jobs) do not bias the results. (See Appendix).

The overall scores are calculated by adding the states' adjusted scores in each of the five indicator categories and then dividing that total by the sum of the highest score achieved by any state in each category. Thus, each state's final score is a percentage of the total score a state would have achieved if it had finished first in every category.

Maps were coded using the following methodology: The range between the highest and lowest scores was calculated and divided by four. That product was subtracted from the top score to calculate the range for the 100th to 76th percentile, and likewise for the other three percentile ranges. In other words, the percentiles do not necessarily divide into an equal number of states, but rather indicate which state scores fall into a particular range.

OVERALL SCORES



2007 Rank	2007 Score	State	1999 Rank	1999 Score	2002 Rank	2002 Score	Rank Change from 1999*	Rank Change from 2002**
1	96.1	Massachusetts	1	82.3	1	94.5	0	0
2	86.4	New Jersey	8	60.9	6	81.8	6	4
3	85.0	Maryland	11	59.2	5	83.0	8	2
4	84.6	Washington	4	69.0	4	86.1	0	0
5	82.9	California	2	74.3	2	90.1	-3	-3
6	81.8	Connecticut	5	64.9	7	78.8	-1	1
7	79.6	Delaware	9	59.9	9	76.4	2	2
8	79.5	Virginia	12	58.8	8	77.5	4	0
9	78.3	Colorado	3	72.3	3	86.2	-6	-6
10	77.4	New York	16	54.5	11	75.1	6	1
11	75.3	Minnesota	14	56.5	14	72.7	3	3
12	73.2	Utah	6	64.0	16	72.1	-6	4
13	71.1	New Hampshire	7	62.5	12	73.9	-6	-1
14	68.6	Texas	17	52.3	10	75.3	3	-4
15	68.6	Rhode Island	29	45.3	23	65.8	14	8
16	68.4	Illinois	22	48.4	19	68.5	6	3
17	66.8	Oregon	15	56.1	13	73.8	-2	-4
18	64.8	Georgia	25	46.6	18	69.3	7	0
19	64.7	Michigan	34	44.6	22	66.3	15	3
20	64.5	Vermont	18	51.9	26	63.1	-2	6
21	63.6	Pennsylvania	24	46.7	21	66.9	3	0
22	63.2	Arizona	10	59.2	15	72.2	-12	-7
23	63.2	Florida	20	50.8	17	70.3	-3	-6
24	62.8	Idaho	23	47.9	20	67.5	-1	-4
25	62.4	Alaska	13	57.7	39	55.6	-12	14

2007 Rank	2007 Score	State	1999 Rank	1999 Score	2002 Rank	2002 Score	Rank Change from 1999*	Rank Change from 2002**
26	60.2	North Carolina	30	45.2	24	63.9	4	-2
27	59.2	Nevada	21	49.0	31	59.2	-6	4
28	59.0	Nebraska	36	41.8	36	56.7	8	8
29	57.8	Ohio	33	44.8	27	61.7	4	-2
30	55.9	Wisconsin	32	44.9	37	56.5	2	7
31	55.8	Indiana	37	41.0	32	58.0	6	1
32	55.6	Maine	28	45.6	29	61.2	-4	-3
33	53.7	New Mexico	19	51.4	25	63.2	-14	-8
34	53.6	Kansas	27	45.8	30	59.4	-7	-4
35	53.5	Missouri	35	44.2	28	61.3	0	-7
36	53.3	Tennessee	31	45.1	34	56.9	-5	-2
37	51.9	North Dakota	45	29.0	47	47.8	8	10
38	51.8	Iowa	42	33.5	40	54.1	4	2
39	51.5	South Carolina	38	39.7	35	56.9	-1	-4
40	51.4	Oklahoma	40	38.6	33	57.0	0	-7
41	50.9	Hawaii	26	46.1	38	56.3	-15	-3
42	49.5	Montana	46	29.0	41	52.9	4	-1
43	47.9	Wyoming	41	34.5	43	52.0	-2	0
44	45.9	Louisiana	47	28.2	44	51.7	3	0
45	45.3	Kentucky	39	39.4	42	52.3	-6	-3
46	45.1	Alabama	44	32.3	45	50.2	-2	-1
47	44.7	Arkansas	49	26.2	49	43.5	2	2
48	43.8	South Dakota	43	32.3	46	49.9	-5	-2
49	36.5	Mississippi	50	22.6	50	43.0	1	1
50	35.6	West Virginia	48	26.8	48	44.2	-2	-2

** Because of differences in methodology and indicators measured, changes in ranks between 1999 and 2007 cannot all be attributed to changes in actual economic conditions in the state.*

***While the 2002 and 2007 reports measure different indicators, methodological differences have been eliminated between them in order to make the two scores as closely comparable as possible. As a result, the final 2002 scores listed here do not reflect the actual scores published in that report.*

STATE NEW ECONOMY SCORES BY OVERALL RANK

State	Overall		IT Professionals		Managerial, Professional, Technical Jobs		Workforce Education		Immigration of Knowledge Workers		Manufacturing Value-Added		High-Wage Traded Services		Export Focus of Manufacturing and Services		Foreign Direct Investment		Package Exports		"Gazelle Jobs"		Job Churning		Fastest Growing Firms	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Massachusetts	1	96.1	4	1.86%	1	26.8%	1	52.4	15	14.1	2	46.8%	7	16.8%	11	$27,535	5	4.5%	4	0.21	21	7.6%	39	22.6%	2	0.075%
New Jersey	2	86.4	3	1.94%	5	23.6%	6	46.9	29	13.5	32	21.1%	5	17.3%	19	$23,039	6	4.5%	3	0.22	6	11.3%	8	29.0%	5	0.041%
Maryland	3	85.0	2	2.06%	2	24.8%	3	49.5	19	13.8	10	37.1%	25	13.0%	31	$18,054	19	3.1%	36	0.08	4	11.6%	4	31.2%	3	0.058%
Washington	4	84.6	10	1.48%	16	21.1%	11	44.6	5	14.6	3	46.7%	31	12.1%	1	$59,547	33	2.3%	22	0.14	9	9.1%	2	37.2%	10	0.032%
California	5	82.9	16	1.29%	17	21.0%	12	43.0	33	13.2	20	26.7%	6	17.1%	9	$28,883	23	2.7%	19	0.14	10	9.0%	28	24.0%	9	0.034%
Connecticut	6	81.8	5	1.83%	3	24.5%	4	49.4	2	14.8	14	33.2%	2	20.2%	26	$19,058	4	4.8%	13	0.16	25	6.8%	46	20.5%	12	0.030%
Delaware	7	79.6	8	1.56%	10	22.3%	20	40.4	22	13.7	21	25.7%	1	24.3%	7	$29,864	2	5.0%	10	0.18	2	13.5%	19	25.9%	14	0.023%
Virginia	8	79.5	1	2.36%	8	22.9%	5	47.1	11	14.2	4	45.9%	9	16.4%	32	$17,793	21	2.9%	34	0.10	15	8.6%	21	25.5%	1	0.082%
Colorado	9	78.3	6	1.60%	14	21.4%	2	50.0	34	13.2	11	35.9%	16	14.2%	33	$17,489	32	2.4%	32	0.10	8	9.3%	30	23.8%	8	0.035%
New York	10	77.4	11	1.47%	4	23.9%	9	45.3	10	14.2	27	23.7%	3	19.6%	6	$30,844	14	3.6%	7	0.19	3	11.7%	18	25.9%	19	0.020%
Minnesota	11	75.3	7	1.57%	7	23.0%	10	44.7	28	13.5	9	39.2%	4	17.7%	27	$18,821	30	2.4%	1	0.25	7	10.4%	31	23.5%	13	0.028%
Utah	12	73.2	19	1.24%	23	20.2%	15	42.1	26	13.6	15	33.1%	10	15.5%	23	$20,803	35	2.1%	21	0.14	17	8.2%	3	36.7%	4	0.052%
New Hampshire	13	71.1	20	1.23%	13	21.9%	8	46.0	1	15.3	28	22.7%	13	15.1%	48	$10,926	3	5.0%	15	0.16	28	6.2%	25	24.5%	18	0.020%
Texas	14	68.6	18	1.25%	22	20.2%	34	36.3	44	12.8	35	20.4%	27	12.9%	2	$56,256	24	2.7%	35	0.09	20	7.8%	11	27.1%	7	0.037%
Rhode Island	15	68.6	25	1.17%	6	23.5%	13	42.5	3	14.6	37	18.3%	23	13.1%	50	$8,542	7	4.3%	2	0.25	19	8.0%	29	23.9%	44	0.003%
Illinois	16	68.4	9	1.54%	9	22.6%	14	42.3	20	13.8	40	17.0%	8	16.7%	17	$23,336	17	3.2%	5	0.21	22	7.3%	33	23.3%	29	0.013%
Oregon	17	66.8	30	1.02%	24	20.1%	18	41.4	14	14.1	24	24.6%	19	13.6%	18	$23,141	34	2.2%	18	0.15	30	6.2%	12	27.0%	28	0.013%
Georgia	18	64.8	12	1.40%	19	20.8%	24	38.9	32	13.3	29	21.7%	15	14.5%	16	$23,742	16	3.5%	24	0.12	18	8.0%	13	26.9%	6	0.038%
Michigan	19	64.7	22	1.22%	11	22.1%	28	37.6	6	14.4	22	24.8%	29	12.3%	29	$18,544	10	3.7%	14	0.16	24	6.8%	37	22.6%	30	0.013%
Vermont	20	64.5	32	0.99%	28	19.9%	7	46.5	8	14.4	38	18.2%	50	7.5%	3	$37,574	26	2.6%	16	0.16	48	3.8%	36	22.7%	41	0.005%
Pennsylvania	21	63.6	21	1.23%	12	21.9%	32	37.1	21	13.7	18	28.3%	14	14.5%	36	$15,985	18	3.2%	17	0.15	13	8.7%	26	24.1%	15	0.023%
Arizona	22	63.2	23	1.22%	30	19.8%	23	38.9	49	12.3	13	35.7%	20	13.5%	10	$28,618	38	2.0%	33	0.10	27	6.5%	15	26.7%	11	0.031%
Florida	23	63.2	26	1.13%	40	18.6%	29	37.5	35	13.2	19	27.9%	24	13.0%	12	$25,998	28	2.4%	25	0.12	14	8.6%	7	29.5%	23	0.017%
Idaho	24	62.8	38	0.88%	27	20.1%	37	35.9	45	12.8	50	6.0%	38	11.1%	22	$21,203	47	1.5%	42	0.05	41	4.5%	6	30.8%	20	0.018%
Alaska	25	62.4	35	0.89%	15	21.2%	16	41.6	16	14.0	16	29.5%	42	9.7%	4	$32,277	25	2.6%	50	0.01	11	8.9%	9	28.0%	34	0.012%
North Carolina	26	60.2	15	1.29%	32	19.7%	33	37.1	36	13.1	36	19.3%	28	12.9%	34	$17,482	8	4.0%	26	0.12	16	8.4%	23	25.2%	24	0.016%
Nevada	27	59.2	46	0.66%	50	15.0%	45	31.8	48	12.4	7	40.7%	44	9.0%	5	$31,758	41	1.9%	11	0.17	38	5.1%	1	38.1%	22	0.018%
Nebraska	28	59.0	14	1.38%	34	19.4%	21	40.1	40	12.9	41	16.8%	12	15.1%	43	$13,770	45	1.7%	27	0.12	1	16.6%	44	21.0%	31	0.013%
Ohio	29	57.8	24	1.21%	20	20.7%	39	34.6	7	14.4	30	21.5%	17	13.9%	30	$18,080	20	3.0%	9	0.18	29	6.2%	48	19.5%	17	0.020%
Wisconsin	30	55.9	28	1.07%	35	19.4%	31	37.2	31	13.4	12	35.9%	22	13.2%	42	$14,063	27	2.5%	12	0.17	23	7.3%	47	20.4%	37	0.008%
Indiana	31	55.8	39	0.86%	36	19.0%	43	32.3	30	13.4	1	48.7%	41	10.0%	47	$11,040	11	3.7%	6	0.19	32	5.9%	34	23.0%	16	0.021%
Maine	32	55.6	41	0.79%	21	20.4%	27	38.2	23	13.7	23	24.6%	35	11.5%	37	$15,861	15	3.6%	38	0.06	43	4.3%	40	22.5%	38	0.007%
New Mexico	33	53.7	34	0.91%	18	20.8%	26	38.6	41	12.9	42	16.3%	45	9.0%	13	$25,148	48	1.2%	47	0.03	37	5.2%	14	26.9%	45	0.002%
Kansas	34	53.6	17	1.27%	26	20.1%	19	40.8	17	13.9	48	9.2%	32	12.1%	40	$14,647	42	1.8%	31	0.11	35	5.4%	42	21.9%	39	0.007%
Missouri	35	53.5	13	1.40%	33	19.6%	38	35.2	25	13.7	34	20.8%	11	15.3%	39	$15,363	31	2.4%	29	0.11	31	6.1%	17	26.4%	27	0.014%
Tennessee	36	53.3	31	0.99%	39	18.7%	44	32.2	46	12.7	39	17.8%	33	11.8%	25	$20,040	13	3.6%	28	0.11	12	8.7%	5	30.8%	21	0.018%
North Dakota	37	51.9	43	0.72%	45	17.8%	25	38.9	18	13.9	5	43.5%	39	10.6%	24	$20,301	46	1.7%	37	0.08	26	6.6%	45	20.7%	46	0.000%
Iowa	38	51.8	27	1.09%	42	18.6%	36	35.9	9	14.3	6	42.7%	18	13.6%	41	$14,616	40	1.9%	23	0.14	39	4.9%	49	19.0%	36	0.009%
South Carolina	39	51.5	37	0.88%	38	18.8%	40	34.5	38	13.1	26	24.1%	34	11.5%	15	$24,665	1	5.2%	20	0.14	42	4.4%	27	24.0%	33	0.012%
Oklahoma	40	51.4	29	1.03%	25	20.1%	41	33.5	43	12.9	17	29.3%	36	11.4%	38	$15,599	43	1.8%	41	0.06	36	5.3%	38	22.6%	26	0.014%
Hawaii	41	50.9	40	0.79%	44	18.1%	17	41.4	4	14.6	31	21.3%	46	8.5%	20	$22,442	9	3.9%	49	0.01	47	4.0%	20	25.6%	46	0.000%
Montana	42	49.5	48	0.61%	41	18.6%	22	39.1	13	14.1	45	14.4%	49	7.8%	44	$13,391	49	1.1%	43	0.05	49	3.8%	10	27.3%	35	0.012%
Wyoming	43	47.9	50	0.52%	48	17.3%	35	35.9	27	13.5	44	15.1%	47	8.2%	14	$24,698	29	2.4%	46	0.04	45	4.1%	16	26.7%	46	0.000%
Louisiana	44	45.9	45	0.68%	29	19.8%	46	30.5	24	13.7	25	24.4%	21	13.2%	8	$28,971	39	2.0%	48	0.03	33	5.6%	43	21.5%	42	0.004%
Kentucky	45	45.3	36	0.88%	43	18.6%	47	29.9	42	12.9	33	20.9%	40	10.6%	21	$22,125	12	3.6%	8	0.19	44	4.2%	41	22.1%	25	0.014%
Alabama	46	45.1	33	0.95%	37	18.8%	42	32.6	12	14.2	43	15.6%	37	11.1%	35	$17,119	22	2.9%	39	0.06	34	5.5%	35	22.9%	32	0.013%
Arkansas	47	44.7	47	0.65%	46	17.6%	49	28.7	37	13.1	8	40.2%	30	12.3%	49	$10,679	37	2.1%	40	0.06	5	11.3%	32	23.3%	43	0.003%
South Dakota	48	43.8	42	0.78%	49	17.1%	30	37.3	50	12.0	47	11.4%	26	12.9%	46	$11,305	50	1.0%	30	0.11	46	4.1%	50	15.3%	46	0.000%
Mississippi	49	36.5	49	0.54%	47	17.4%	48	29.8	39	13.0	49	7.3%	43	9.7%	45	$11,540	44	1.7%	44	0.04	40	4.8%	24	24.9%	40	0.006%
West Virginia	50	35.6	44	0.68%	31	19.8%	50	26.1	47	12.6	46	14.0%	48	8.0%	28	$18,817	36	2.1%	45	0.04	50	3.1%	22	25.3%	46	0.000%
U.S. Average		62.1		1.30%		21.0%		39.7		13.5		26.9%		14.5%		$25,374		3.0%		0.14		8.0%		25.4%		0.026%

State	IPOs		Entrepreneurial Activity		Inventor Patents		Online Population		Internet Domain Names		Technology in Schools		E-Gov't		Online Agriculture		Broadband Telecommunications		High-Tech Jobs		Scientists and Engineers		Patents		Industry Investment in R&D		Venture Capital	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
MA	5	5.79	43	0.22%	8	0.109	21	62.5%	15	2.87	33	4.76	18	5.41	1	7.18	7	5.80	1	6.5%	3	0.83%	6	1.00	6	4.11%	1	1.36%
NJ	14	5.16	21	0.29%	9	0.107	20	62.6%	18	2.73	22	5.27	14	5.51	34	4.82	3	6.31	4	5.3%	9	0.54%	8	0.95	3	5.16%	8	0.37%
MD	11	5.23	19	0.30%	20	0.081	10	65.1%	14	2.88	46	3.98	22	5.17	31	4.87	9	5.64	5	5.3%	1	0.98%	11	0.88	9	3.49%	6	0.46%
WA	22	4.59	16	0.32%	18	0.086	6	68.0%	8	3.49	27	5.03	10	5.65	11	5.96	11	5.09	9	4.5%	11	0.52%	3	1.32	31	1.62%	3	0.61%
CA	3	6.04	9	0.36%	1	0.143	34	56.8%	4	4.01	48	3.48	21	5.23	19	5.41	2	6.51	7	5.1%	12	0.50%	4	1.29	5	4.38%	2	1.27%
CT	15	5.10	25	0.27%	6	0.112	7	66.9%	23	2.55	29	5.00	36	4.60	1	7.18	14	5.06	14	4.1%	6	0.56%	14	0.81	7	4.09%	11	0.23%
DE	28	4.27	50	0.13%	13	0.099	27	59.1%	13	2.92	38	4.36	31	4.81	31	4.87	35	3.72	15	3.9%	4	0.69%	5	1.22	1	7.13%	28	0.06%
VA	8	5.62	47	0.20%	35	0.063	18	63.6%	7	3.76	9	5.96	6	5.85	33	4.84	13	5.07	2	5.8%	8	0.55%	26	0.49	18	2.65%	17	0.19%
CO	2	6.24	2	0.44%	12	0.104	9	65.1%	11	3.07	44	4.05	38	4.46	10	6.13	21	4.51	3	5.8%	10	0.54%	2	1.33	16	2.81%	4	0.50%
NY	9	5.53	22	0.29%	19	0.084	35	56.8%	10	3.19	36	4.52	8	5.74	23	5.16	8	5.79	23	3.5%	15	0.46%	7	0.96	27	2.05%	13	0.20%
MN	17	4.97	24	0.28%	5	0.112	4	69.0%	24	2.42	35	4.67	9	5.68	22	5.27	27	4.25	12	4.2%	22	0.37%	13	0.82	8	3.91%	19	0.18%
UT	13	5.17	17	0.31%	2	0.123	3	69.6%	3	4.04	50	2.68	2	6.35	24	5.11	28	4.19	10	4.4%	20	0.40%	19	0.71	28	1.97%	5	0.47%
NH	44	3.28	37	0.25%	3	0.119	2	70.4%	19	2.71	45	3.98	46	3.85	1	7.18	20	4.55	6	5.2%	19	0.41%	36	0.31	11	3.33%	7	0.38%
TX	6	5.67	13	0.35%	32	0.066	43	54.6%	9	3.31	14	5.60	4	6.15	35	4.79	19	4.63	19	3.7%	29	0.31%	17	0.72	21	2.45%	10	0.25%
RI	44	3.28	38	0.24%	31	0.067	32	57.8%	27	2.28	42	4.18	37	4.52	1	7.18	15	5.05	18	3.8%	5	0.57%	16	0.72	2	5.48%	12	0.20%
IL	10	5.27	20	0.30%	26	0.073	31	58.4%	20	2.70	30	4.96	12	5.61	16	5.69	10	5.21	26	3.4%	26	0.35%	24	0.51	15	3.01%	24	0.12%
OR	37	3.86	15	0.34%	7	0.110	23	62.2%	12	2.97	47	3.70	19	5.36	8	6.31	16	4.80	13	4.1%	13	0.48%	9	0.94	10	3.39%	18	0.19%
GA	31	4.16	12	0.35%	44	0.051	37	56.3%	16	2.83	25	5.19	33	4.67	49	3.72	1	6.93	22	3.5%	36	0.29%	25	0.50	35	1.32%	22	0.13%
MI	30	4.21	40	0.24%	16	0.087	28	58.9%	29	2.23	32	4.89	1	6.78	21	5.34	31	4.12	20	3.7%	25	0.35%	15	0.74	4	4.76%	34	0.05%
VT	44	3.28	1	0.46%	17	0.087	8	65.9%	26	2.36	16	5.46	41	4.33	1	7.18	48	3.11	17	3.8%	7	0.56%	10	0.89	23	2.27%	15	0.20%
PA	18	4.82	48	0.18%	25	0.073	26	59.7%	30	2.18	20	5.36	16	5.49	38	4.62	22	4.45	21	3.7%	14	0.46%	22	0.54	13	3.10%	14	0.20%
AZ	40	3.73	35	0.25%	14	0.095	17	63.6%	2	5.04	37	4.36	17	5.41	42	4.29	12	5.08	16	3.9%	30	0.31%	12	0.84	25	2.14%	20	0.16%
FL	24	4.58	32	0.26%	10	0.106	33	57.7%	6	3.80	17	5.46	25	5.10	15	5.72	4	6.07	27	3.2%	48	0.22%	23	0.53	39	1.27%	25	0.10%
ID	12	5.21	5	0.41%	11	0.104	22	62.2%	39	1.73	21	5.30	39	4.44	7	6.57	43	3.36	11	4.4%	23	0.37%	1	2.99	12	3.20%	38	0.02%
AK	44	3.28	6	0.38%	22	0.078	1	71.6%	17	2.78	10	5.95	45	3.85	25	5.04	6	6.00	36	2.2%	28	0.32%	37	0.29	50	0.36%	47	0.00%
NC	25	4.58	36	0.25%	36	0.060	42	55.1%	25	2.37	34	4.75	26	5.03	28	4.99	18	4.67	25	3.4%	17	0.42%	27	0.46	17	2.79%	9	0.28%
NV	1	7.20	46	0.20%	4	0.118	40	55.6%	1	7.15	49	3.21	34	4.64	42	4.29	5	6.03	38	2.2%	50	0.16%	20	0.63	40	1.11%	21	0.14%
NE	35	3.94	34	0.25%	27	0.070	11	64.8%	43	1.50	7	6.04	13	5.52	18	5.57	23	4.45	28	3.1%	43	0.26%	38	0.29	36	1.29%	40	0.02%
OH	32	4.10	23	0.29%	28	0.068	30	58.6%	28	2.25	12	5.67	5	6.07	37	4.68	33	3.93	32	2.6%	24	0.36%	29	0.44	19	2.58%	35	0.04%
WI	41	3.72	18	0.30%	23	0.078	15	64.1%	37	1.81	15	5.54	27	4.96	20	5.37	38	3.65	33	2.6%	33	0.29%	35	0.34	20	2.58%	33	0.05%
IN	23	4.59	28	0.27%	42	0.055	29	58.8%	33	1.89	19	5.40	3	6.35	29	4.95	32	4.00	30	3.0%	37	0.29%	48	0.21	24	2.24%	29	0.06%
ME	16	5.01	14	0.34%	41	0.055	13	64.5%	41	1.60	2	7.29	32	4.75	1	7.18	45	3.26	35	2.3%	27	0.33%	31	0.40	41	1.09%	45	0.01%
NM	44	3.28	8	0.37%	30	0.067	46	51.8%	32	1.90	18	5.41	49	3.41	39	4.47	36	3.69	8	4.5%	2	0.94%	18	0.72	37	1.29%	16	0.19%
KS	42	3.67	33	0.26%	34	0.065	16	63.8%	38	1.75	4	6.35	23	5.17	30	4.91	24	4.42	24	3.4%	40	0.28%	32	0.40	26	2.14%	47	0.00%
MO	27	4.42	45	0.21%	37	0.058	24	60.5%	34	1.87	11	5.70	29	4.94	44	4.07	37	3.65	31	2.9%	32	0.30%	33	0.36	30	1.67%	26	0.09%
TN	19	4.73	41	0.23%	45	0.047	39	55.8%	22	2.61	28	5.03	7	5.78	47	3.84	25	4.30	39	2.1%	31	0.30%	47	0.23	33	1.43%	31	0.05%
ND	44	3.28	29	0.26%	21	0.080	12	64.5%	44	1.48	6	6.08	20	5.29	12	5.83	41	3.37	37	2.2%	35	0.29%	39	0.28	22	2.28%	47	0.00%
IA	38	3.81	26	0.27%	38	0.057	19	63.5%	42	1.56	13	5.64	43	4.20	13	5.75	39	3.55	34	2.3%	38	0.28%	34	0.35	29	1.74%	42	0.01%
SC	33	3.96	39	0.24%	40	0.056	45	52.4%	35	1.82	24	5.21	28	4.95	40	4.38	30	4.13	40	2.1%	42	0.26%	42	0.27	32	1.44%	44	0.01%
OK	4	6.04	3	0.43%	39	0.057	41	55.3%	31	1.97	26	5.05	44	4.05	36	4.71	29	4.16	42	2.1%	41	0.27%	30	0.42	38	1.28%	30	0.06%
HI	34	3.96	31	0.26%	43	0.051	38	56.1%	5	3.88	39	4.29	42	4.22	25	5.04	26	4.26	46	1.9%	16	0.43%	44	0.26	45	0.75%	32	0.05%
MT	20	4.66	4	0.41%	24	0.076	25	60.0%	45	1.48	8	5.97	24	5.15	9	6.29	49	3.03	47	1.8%	18	0.41%	21	0.57	47	0.67%	23	0.12%
WY	44	3.28	10	0.36%	15	0.093	5	68.4%	48	1.05	3	6.79	50	3.29	14	5.75	46	3.21	50	1.4%	21	0.39%	28	0.45	48	0.53%	27	0.07%
LA	26	4.45	30	0.26%	33	0.066	48	50.0%	21	2.63	41	4.23	40	4.38	45	4.00	17	4.74	48	1.7%	44	0.26%	40	0.28	49	0.48%	46	0.00%
KY	29	4.25	42	0.23%	48	0.033	36	56.6%	40	1.61	31	4.90	11	5.63	50	3.36	40	3.53	44	2.0%	46	0.25%	43	0.26	43	0.85%	36	0.03%
AL	21	4.62	44	0.22%	46	0.046	44	53.2%	36	1.81	43	4.06	47	3.63	48	3.82	34	3.78	29	3.1%	39	0.28%	45	0.24	34	1.36%	41	0.02%
AR	39	3.75	7	0.38%	47	0.036	49	49.9%	46	1.34	23	5.23	30	4.87	41	4.33	47	3.17	41	2.1%	49	0.22%	50	0.12	44	0.77%	39	0.02%
SD	7	5.66	27	0.27%	29	0.068	14	64.1%	50	0.91	1	7.43	15	5.50	17	5.65	44	3.35	43	2.0%	47	0.23%	41	0.28	46	0.71%	47	0.00%
MS	36	3.88	11	0.35%	49	0.032	50	42.6%	49	0.96	40	4.29	35	4.60	46	3.98	42	3.36	49	1.5%	45	0.25%	49	0.15	14	3.03%	43	0.01%
WV	44	3.28	49	0.17%	50	0.031	47	51.5%	47	1.30	5	6.09	48	3.57	27	5.00	50	2.94	45	1.9%	34	0.29%	46	0.24	42	0.96%	37	0.03%
		5.00		0.30%		0.085		58.7%		2.94		5.00		5.00		5.00		5.00		3.7%		0.41%		0.75		3.17%		0.35%

STATE NEW ECONOMY SCORES IN ALPHABETICAL ORDER

State	Overall		IT Professionals		Managerial, Professional, Technical Jobs		Workforce Education		Immigration of Knowledge Workers		Manufacturing Value-Added		High-Wage Traded Services		Export Focus of Manufacturing and Services		Foreign Direct Investment		Package Exports		"Gazelle Jobs"		Job Churning		Fastest Growing Firms	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Alabama	46	45.1	33	0.95%	37	18.8%	42	32.6	12	14.2	43	15.6%	37	11.1%	35	$17,119	22	2.9%	39	0.06	34	5.5%	35	22.9%	32	0.013%
Alaska	25	62.4	35	0.89%	15	21.2%	16	41.6	16	14.0	16	29.5%	42	9.7%	4	$32,277	25	2.6%	50	0.01	11	8.9%	9	28.0%	34	0.012%
Arizona	22	63.2	23	1.22%	30	19.8%	23	38.9	49	12.3	13	35.7%	20	13.5%	10	$28,618	38	2.0%	33	0.10	27	6.5%	15	26.7%	11	0.031%
Arkansas	47	44.7	47	0.65%	46	17.6%	49	28.7	37	13.1	8	40.2%	30	12.3%	49	$10,679	37	2.1%	40	0.06	5	11.3%	32	23.3%	43	0.003%
California	5	82.9	16	1.29%	17	21.0%	12	43.0	33	13.2	20	26.7%	6	17.1%	9	$28,883	23	2.7%	19	0.14	10	9.0%	28	24.0%	9	0.034%
Colorado	9	78.3	6	1.60%	14	21.4%	2	50.0	34	13.2	11	35.9%	16	14.2%	33	$17,489	32	2.4%	32	0.10	8	9.3%	30	23.8%	8	0.035%
Connecticut	6	81.8	5	1.83%	3	24.5%	4	49.4	2	14.8	14	33.2%	2	20.2%	26	$19,058	4	4.8%	13	0.16	25	6.8%	46	20.5%	12	0.030%
Delaware	7	79.6	8	1.56%	10	22.3%	20	40.4	22	13.7	21	25.7%	1	24.3%	7	$29,864	2	5.0%	10	0.18	2	13.5%	19	25.9%	14	0.023%
Florida	23	63.2	26	1.13%	40	18.6%	29	37.5	35	13.2	19	27.9%	24	13.0%	12	$25,998	28	2.4%	25	0.12	14	8.6%	7	29.5%	23	0.017%
Georgia	18	64.8	12	1.40%	19	20.8%	24	38.9	32	13.3	29	21.7%	15	14.5%	16	$23,742	16	3.5%	24	0.12	18	8.0%	13	26.9%	6	0.038%
Hawaii	41	50.9	40	0.79%	44	18.1%	17	41.4	4	14.6	31	21.3%	46	8.5%	20	$22,442	9	3.9%	49	0.01	47	4.0%	20	25.6%	46	0.000%
Idaho	24	62.8	38	0.88%	27	20.1%	37	35.9	45	12.8	50	6.0%	38	11.1%	22	$21,203	47	1.5%	42	0.05	41	4.5%	6	30.8%	20	0.018%
Illinois	16	68.4	9	1.54%	9	22.6%	14	42.3	20	13.8	40	17.0%	8	16.7%	17	$23,336	17	3.2%	5	0.20	22	7.3%	33	23.3%	29	0.013%
Indiana	31	55.8	39	0.86%	36	19.0%	43	32.3	30	13.4	1	48.7%	41	10.0%	47	$11,040	11	3.7%	6	0.19	32	5.9%	34	23.0%	16	0.021%
Iowa	38	51.8	27	1.09%	42	18.6%	36	35.9	9	14.3	6	42.7%	18	13.6%	41	$14,616	40	1.9%	23	0.14	39	4.9%	49	19.0%	36	0.009%
Kansas	34	53.6	17	1.27%	26	20.1%	19	40.8	17	13.9	48	9.2%	32	12.1%	40	$14,647	42	1.8%	31	0.11	35	5.4%	42	21.9%	39	0.007%
Kentucky	45	45.3	36	0.88%	43	18.6%	47	29.9	42	12.9	33	20.9%	40	10.6%	21	$22,125	12	3.6%	8	0.19	44	4.2%	41	22.1%	25	0.014%
Louisiana	44	45.9	45	0.68%	29	19.8%	46	30.5	24	13.7	25	24.4%	21	13.2%	8	$28,971	39	2.0%	48	0.03	33	5.6%	43	21.5%	42	0.004%
Maine	32	55.6	41	0.79%	21	20.4%	27	38.2	23	13.7	23	24.6%	35	11.5%	37	$15,861	15	3.6%	38	0.06	43	4.3%	40	22.5%	38	0.007%
Maryland	3	85.0	2	2.06%	2	24.8%	3	49.5	19	13.8	10	37.1%	25	13.0%	31	$18,054	19	3.1%	36	0.08	4	11.6%	4	31.2%	3	0.058%
Massachusetts	1	96.1	4	1.86%	1	26.8%	1	52.4	15	14.1	2	46.8%	7	16.8%	11	$27,535	5	4.5%	4	0.21	21	7.6%	39	22.6%	2	0.075%
Michigan	19	64.7	22	1.22%	11	22.1%	28	37.6	6	14.4	22	24.8%	29	12.3%	29	$18,544	10	3.7%	14	0.16	24	6.8%	37	22.6%	30	0.013%
Minnesota	11	75.3	7	1.57%	7	23.0%	10	44.7	28	13.5	9	39.2%	4	17.7%	27	$18,821	30	2.4%	1	0.25	7	10.4%	31	23.5%	13	0.028%
Mississippi	49	36.5	49	0.54%	47	17.4%	48	29.8	39	13.0	49	7.3%	43	9.7%	45	$11,540	44	1.7%	44	0.04	40	4.8%	24	24.9%	40	0.006%
Missouri	35	53.5	13	1.40%	33	19.6%	38	35.2	25	13.7	34	20.8%	11	15.3%	39	$15,363	31	2.4%	29	0.11	31	6.1%	17	26.4%	27	0.014%
Montana	42	49.5	48	0.61%	41	18.6%	22	39.1	13	14.1	45	14.4%	49	7.8%	44	$13,391	49	1.1%	43	0.05	49	3.8%	10	27.3%	35	0.012%
Nebraska	28	59.0	14	1.38%	34	19.4%	21	40.1	40	12.9	41	16.8%	12	15.1%	43	$13,770	45	1.7%	27	0.12	1	16.6%	44	21.0%	31	0.013%
Nevada	27	59.2	46	0.66%	50	15.0%	45	31.8	48	12.4	7	40.7%	44	9.0%	5	$31,758	41	1.9%	11	0.17	38	5.1%	1	38.1%	22	0.018%
New Hampshire	13	71.1	20	1.23%	13	21.9%	8	46.0	1	15.3	28	22.7%	13	15.1%	48	$10,926	3	5.0%	15	0.16	28	6.2%	25	24.5%	18	0.020%
New Jersey	2	86.4	3	1.94%	5	23.6%	6	46.9	29	13.5	32	21.1%	5	17.3%	19	$23,039	6	4.5%	3	0.22	6	11.3%	8	29.0%	5	0.041%
New Mexico	33	53.7	34	0.91%	18	20.8%	26	38.6	41	12.9	42	16.3%	45	9.0%	13	$25,148	48	1.2%	47	0.03	37	5.2%	14	26.9%	45	0.002%
New York	10	77.4	11	1.47%	4	23.9%	9	45.3	10	14.2	27	23.7%	3	19.6%	6	$30,844	14	3.6%	7	0.19	3	11.7%	18	25.9%	19	0.020%
North Carolina	26	60.2	15	1.29%	32	19.7%	33	37.1	36	13.1	36	19.3%	28	12.9%	34	$17,482	8	4.0%	26	0.12	16	8.4%	23	25.2%	24	0.016%
North Dakota	37	51.9	43	0.72%	45	17.8%	25	38.9	18	13.9	5	43.5%	39	10.6%	24	$20,301	46	1.7%	37	0.08	26	6.6%	45	20.7%	46	0.000%
Ohio	29	57.8	24	1.21%	20	20.7%	39	34.6	7	14.4	30	21.5%	17	13.9%	30	$18,080	20	3.0%	9	0.18	29	6.2%	48	19.5%	17	0.020%
Oklahoma	40	51.4	29	1.03%	25	20.1%	41	33.5	43	12.9	17	29.3%	36	11.4%	38	$15,599	43	1.8%	41	0.06	36	5.3%	38	22.6%	26	0.014%
Oregon	17	66.7	30	1.02%	24	20.1%	18	41.4	14	14.1	24	24.6%	19	13.6%	18	$23,141	34	2.2%	18	0.15	30	6.2%	12	27.0%	28	0.013%
Pennsylvania	21	63.6	21	1.23%	12	21.9%	32	37.1	21	13.7	18	28.3%	14	14.5%	36	$15,985	18	3.2%	17	0.15	13	8.7%	26	24.1%	15	0.023%
Rhode Island	15	68.6	25	1.17%	6	23.5%	13	42.5	3	14.6	37	18.3%	23	13.1%	50	$8,542	7	4.3%	2	0.25	19	8.0%	29	23.9%	44	0.003%
South Carolina	39	51.5	37	0.88%	38	18.8%	40	34.5	38	13.1	26	24.1%	34	11.5%	15	$24,665	1	5.2%	20	0.14	42	4.4%	27	24.0%	33	0.012%
South Dakota	48	43.8	42	0.78%	49	17.1%	30	37.3	50	12.0	47	11.4%	26	12.9%	46	$11,305	50	1.0%	30	0.11	46	4.1%	50	15.3%	46	0.000%
Tennessee	36	53.3	31	0.99%	39	18.7%	44	32.2	46	12.7	39	17.8%	33	11.8%	25	$20,040	13	3.6%	28	0.11	12	8.7%	5	30.8%	21	0.018%
Texas	14	68.6	18	1.25%	22	20.2%	34	36.3	44	12.8	35	20.4%	27	12.9%	2	$56,256	24	2.7%	35	0.09	20	7.8%	11	27.1%	7	0.037%
Utah	12	73.2	19	1.24%	23	20.2%	15	42.1	26	13.6	15	33.1%	10	15.5%	23	$20,803	35	2.1%	21	0.14	17	8.2%	3	36.7%	4	0.052%
Vermont	20	64.5	32	0.99%	28	19.9%	7	46.5	8	14.4	38	18.2%	50	7.5%	3	$37,574	26	2.6%	16	0.16	48	3.8%	36	22.7%	41	0.005%
Virginia	8	79.5	1	2.36%	8	22.9%	5	47.1	11	14.2	4	45.9%	9	16.4%	32	$17,793	21	2.9%	34	0.10	15	8.6%	21	25.5%	1	0.082%
Washington	4	84.6	10	1.48%	16	21.1%	11	44.6	5	14.6	3	46.7%	31	12.1%	1	$59,547	33	2.3%	22	0.14	9	9.1%	2	37.2%	10	0.032%
West Virginia	50	35.6	44	0.68%	31	19.8%	50	26.1	47	12.6	46	14.0%	48	8.0%	28	$18,817	36	2.1%	45	0.04	50	3.1%	22	25.3%	46	0.000%
Wisconsin	30	55.9	28	1.07%	35	19.4%	31	37.2	31	13.4	12	35.9%	22	13.2%	42	$14,063	27	2.5%	12	0.17	23	7.3%	47	20.4%	37	0.008%
Wyoming	43	47.9	50	0.52%	48	17.3%	35	35.9	27	13.5	44	15.1%	47	8.2%	14	$24,698	29	2.4%	46	0.04	45	4.1%	16	26.7%	46	0.000%
U.S. Average		62.1		1.30%		21.0%		39.7		13.5		26.9%		14.5%		$25,374		3.0%		0.14		8.0%		25.4%		0.026%

State	IPOs		Entrepreneurial Activity		Inventor Patents		Online Population		Internet Domain Names		Technology in Schools		E-Gov't		Online Agriculture		Broadband Telecommunications		High-Tech Jobs		Scientists and Engineers		Patents		Industry Investment in R&D		Venture Capital	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
AL	21	4.62	44	0.22%	46	0.046	44	53.2%	36	1.81	43	4.06	47	3.63	48	3.82	34	3.78	29	3.1%	39	0.28%	45	0.24	34	1.36%	41	0.02%
AK	44	3.28	6	0.38%	22	0.078	1	71.6%	17	2.78	10	5.95	45	3.85	25	5.04	6	6.00	36	2.2%	28	0.32%	37	0.29	50	0.36%	47	0.00%
AZ	40	3.73	35	0.25%	14	0.095	17	63.6%	2	5.04	37	4.36	17	5.41	42	4.29	12	5.08	16	3.9%	30	0.31%	12	0.84	25	2.14%	20	0.16%
AR	39	3.75	7	0.38%	47	0.036	49	49.9%	46	1.34	23	5.23	30	4.87	41	4.33	47	3.17	41	2.1%	49	0.22%	50	0.12	44	0.77%	39	0.02%
CA	3	6.04	9	0.36%	1	0.143	34	56.8%	4	4.01	48	3.48	21	5.23	19	5.41	2	6.51	7	5.1%	12	0.50%	4	1.29	5	4.38%	2	1.27%
CO	2	6.24	2	0.44%	12	0.104	9	65.1%	11	3.07	44	4.05	38	4.46	10	6.13	21	4.51	3	5.8%	10	0.54%	2	1.33	16	2.81%	4	0.50%
CT	15	5.10	25	0.27%	6	0.112	7	66.9%	23	2.55	29	5.00	36	4.60	1	7.18	14	5.06	14	4.1%	6	0.56%	14	0.81	7	4.09%	11	0.23%
DE	28	4.27	50	0.13%	13	0.099	27	59.1%	13	2.92	38	4.36	31	4.81	31	4.87	35	3.72	15	3.9%	4	0.69%	5	1.22	1	7.13%	28	0.06%
FL	24	4.58	32	0.26%	10	0.106	33	57.7%	6	3.80	17	5.46	25	5.10	15	5.72	4	6.07	27	3.2%	48	0.22%	23	0.53	39	1.27%	25	0.10%
GA	31	4.16	12	0.35%	44	0.051	37	56.3%	16	2.83	25	5.19	33	4.67	49	3.72	1	6.93	22	3.5%	36	0.29%	25	0.50	35	1.32%	22	0.13%
HI	34	3.96	31	0.26%	43	0.051	38	56.1%	5	3.88	39	4.29	42	4.22	25	5.04	26	4.26	46	1.9%	16	0.43%	44	0.26	45	0.75%	32	0.05%
ID	12	5.21	5	0.41%	11	0.104	22	62.2%	39	1.73	21	5.30	39	4.44	7	6.57	43	3.36	11	4.4%	23	0.37%	1	2.99	12	3.20%	38	0.02%
IL	10	5.27	20	0.30%	26	0.073	31	58.4%	20	2.70	30	4.96	12	5.61	16	5.69	10	5.21	26	3.4%	26	0.35%	24	0.51	15	3.01%	24	0.12%
IN	23	4.59	28	0.27%	42	0.055	29	58.8%	33	1.89	19	5.40	3	6.35	29	4.95	32	4.00	30	3.0%	37	0.29%	48	0.21	24	2.24%	29	0.06%
IA	38	3.81	26	0.27%	38	0.057	19	63.5%	42	1.56	13	5.64	43	4.20	13	5.75	39	3.55	34	2.3%	38	0.28%	34	0.35	29	1.74%	42	0.01%
KS	42	3.67	33	0.26%	34	0.065	16	63.8%	38	1.75	4	6.35	23	5.17	30	4.91	24	4.42	24	3.4%	40	0.28%	32	0.40	26	2.14%	47	0.00%
KY	29	4.25	42	0.23%	48	0.033	36	56.6%	40	1.61	31	4.90	11	5.63	50	3.36	40	3.53	44	2.0%	46	0.25%	43	0.26	43	0.85%	36	0.03%
LA	26	4.45	30	0.26%	33	0.066	48	50.0%	21	2.63	41	4.23	40	4.38	45	4.00	17	4.74	48	1.7%	44	0.26%	40	0.28	49	0.48%	46	0.00%
ME	16	5.01	14	0.34%	41	0.055	13	64.5%	41	1.60	2	7.29	32	4.75	1	7.18	45	3.26	35	2.3%	27	0.33%	31	0.40	41	1.09%	45	0.01%
MD	11	5.23	19	0.30%	20	0.081	10	65.1%	14	2.88	46	3.98	22	5.17	31	4.87	9	5.64	5	5.3%	1	0.98%	11	0.88	9	3.49%	6	0.46%
MA	5	5.79	43	0.22%	8	0.109	21	62.5%	15	2.87	33	4.76	18	5.41	1	7.18	7	5.80	1	6.5%	3	0.83%	6	1.00	6	4.11%	1	1.36%
MI	30	4.21	40	0.24%	16	0.087	28	58.9%	29	2.23	32	4.89	1	6.78	21	5.34	31	4.12	20	3.7%	25	0.35%	15	0.74	4	4.76%	34	0.05%
MN	17	4.97	24	0.28%	5	0.112	4	69.0%	24	2.42	35	4.67	9	5.68	22	5.27	27	4.25	12	4.2%	22	0.37%	13	0.82	8	3.91%	19	0.18%
MS	36	3.88	11	0.35%	49	0.032	50	42.6%	49	0.96	40	4.29	35	4.60	46	3.98	42	3.36	49	1.5%	45	0.25%	49	0.15	14	3.03%	43	0.01%
MO	27	4.42	45	0.21%	37	0.058	24	60.5%	34	1.87	11	5.70	29	4.94	44	4.07	37	3.65	31	2.9%	32	0.30%	33	0.36	30	1.67%	26	0.09%
MT	20	4.66	4	0.41%	24	0.076	25	60.0%	45	1.48	8	5.97	24	5.15	9	6.29	49	3.03	47	1.8%	18	0.41%	21	0.57	47	0.67%	23	0.12%
NE	35	3.94	34	0.25%	27	0.070	11	64.8%	43	1.50	7	6.04	13	5.52	18	5.57	23	4.45	28	3.1%	43	0.26%	38	0.29	36	1.29%	40	0.02%
NV	1	7.20	46	0.20%	4	0.118	40	55.6%	1	7.15	49	3.21	34	4.64	42	4.29	5	6.03	38	2.2%	50	0.16%	20	0.63	40	1.11%	21	0.14%
NH	44	3.28	37	0.25%	3	0.119	2	70.4%	19	2.71	45	3.98	46	3.85	1	7.18	20	4.55	6	5.2%	19	0.41%	36	0.31	11	3.33%	7	0.38%
NJ	14	5.16	21	0.29%	9	0.107	20	62.6%	18	2.73	22	5.27	14	5.51	34	4.82	3	6.31	4	5.3%	9	0.54%	8	0.95	3	5.16%	8	0.37%
NM	44	3.28	8	0.37%	30	0.067	46	51.8%	32	1.90	18	5.41	49	3.41	39	4.47	36	3.69	8	4.5%	2	0.94%	18	0.72	37	1.29%	16	0.19%
NY	9	5.53	22	0.29%	19	0.084	35	56.8%	10	3.19	36	4.52	8	5.74	23	5.16	8	5.79	23	3.5%	15	0.46%	7	0.96	27	2.05%	13	0.20%
NC	25	4.58	36	0.25%	36	0.060	42	55.1%	25	2.37	34	4.75	26	5.03	28	4.99	18	4.67	25	3.4%	17	0.42%	27	0.46	17	2.79%	9	0.28%
ND	44	3.28	29	0.26%	21	0.080	12	64.5%	44	1.48	6	6.08	20	5.29	12	5.83	41	3.37	37	2.2%	35	0.29%	39	0.28	22	2.28%	47	0.00%
OH	32	4.10	23	0.29%	28	0.068	30	58.6%	28	2.25	12	5.67	5	6.07	37	4.68	33	3.93	32	2.6%	24	0.36%	29	0.44	19	2.58%	35	0.04%
OK	4	6.04	3	0.43%	39	0.057	41	55.3%	31	1.97	26	5.05	44	4.05	36	4.71	29	4.16	42	2.1%	41	0.27%	30	0.42	38	1.28%	30	0.06%
OR	37	3.86	15	0.34%	7	0.110	23	62.2%	12	2.97	47	3.70	19	5.36	8	6.31	16	4.80	13	4.1%	13	0.48%	9	0.94	10	3.39%	18	0.19%
PA	18	4.82	48	0.18%	25	0.073	26	59.7%	30	2.18	20	5.36	16	5.49	38	4.62	22	4.45	21	3.7%	14	0.46%	22	0.54	13	3.10%	14	0.20%
RI	44	3.28	38	0.24%	31	0.067	32	57.8%	27	2.28	42	4.18	37	4.52	1	7.18	15	5.05	18	3.8%	5	0.57%	16	0.72	2	5.48%	12	0.20%
SC	33	3.96	39	0.24%	40	0.056	45	52.4%	35	1.82	24	5.21	28	4.95	40	4.38	30	4.13	40	2.1%	42	0.26%	42	0.27	32	1.44%	44	0.01%
SD	7	5.66	27	0.27%	29	0.068	14	64.1%	50	0.91	1	7.43	15	5.50	17	5.65	44	3.35	43	2.0%	47	0.23%	41	0.28	46	0.71%	47	0.00%
TN	19	4.73	41	0.23%	45	0.047	39	55.8%	22	2.61	28	5.03	7	5.78	47	3.84	25	4.30	39	2.1%	31	0.30%	47	0.23	33	1.43%	31	0.05%
TX	6	5.67	13	0.35%	32	0.066	43	54.6%	9	3.31	14	5.60	4	6.15	35	4.79	19	4.63	19	3.7%	29	0.31%	17	0.72	21	2.45%	10	0.25%
UT	13	5.17	17	0.31%	2	0.123	3	69.6%	3	4.04	50	2.68	2	6.35	24	5.11	28	4.19	10	4.4%	20	0.40%	19	0.71	28	1.97%	5	0.47%
VT	44	3.28	1	0.46%	17	0.087	8	65.9%	26	2.36	16	5.46	41	4.33	1	7.18	48	3.11	17	3.8%	7	0.56%	10	0.89	23	2.27%	15	0.20%
VA	8	5.62	47	0.20%	35	0.063	18	63.6%	7	3.76	9	5.96	6	5.85	33	4.84	13	5.07	2	5.8%	8	0.55%	26	0.49	18	2.65%	17	0.19%
WA	22	4.59	16	0.32%	18	0.086	6	68.0%	8	3.49	27	5.03	10	5.65	11	5.96	11	5.09	9	4.5%	11	0.52%	3	1.32	31	1.62%	3	0.61%
WV	44	3.28	49	0.17%	50	0.031	47	51.5%	47	1.30	5	6.09	48	3.57	27	5.00	50	2.94	45	1.9%	34	0.29%	46	0.24	42	0.96%	37	0.03%
WI	41	3.72	18	0.30%	23	0.078	15	64.1%	37	1.81	15	5.54	27	4.96	20	5.37	38	3.65	33	2.6%	33	0.29%	35	0.34	20	2.58%	33	0.05%
WY	44	3.28	10	0.36%	15	0.093	5	68.4%	48	1.05	3	6.79	50	3.29	14	5.75	46	3.21	50	1.4%	21	0.39%	28	0.45	48	0.53%	27	0.07%
		5.00		0.30%		0.085		58.7%		2.94		5.00		5.00		5.00		5.00		3.7%		0.41%		0.75		3.17%		0.35%

SUMMARY OF RESULTS

The state farthest along the path to the New Economy is Massachusetts. After topping the list in 1999 and 2002, Massachusetts has increased its lead over other states in 2007. Massachusetts boasts a concentration of software, hardware, and biotech firms that are supported by world-class universities such as MIT and Harvard in the Route 128 region around Boston. The state survived the early 2000s downturn and has continued to thrive, enjoying the 4th highest increase in per capita income between 2002 and 2005. New Jersey and Maryland, states that ranked 5th and 6th respectively in 2002, moved up in the rankings, and are now the second and third New Economy states in the nation. New Jersey has a strong pharmaceutical industry, coupled with a high-tech agglomeration around Princeton and an advanced services sector in Northern New Jersey. High levels of inward foreign direct investment also help drive the state to second place. Maryland scores high, in part, because of its high concentration of knowledge workers, many employed in the suburbs of the District of Columbia and in federal laboratory facilities or companies related to them. Washington State comes in at fourth (down from second in 2002), 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 the 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. These states 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 states also show above-average levels of entrepreneurship, though some, like Massachusetts and Connecticut, are not growing rapidly in employment. Most are at the forefront of the IT and Internet revolution, with a large share of their institutions and residents embracing the digital economy. In fact, the share of jobs in IT occupations outside the IT industry is highly correlated (0.83) with a state's rank. Most have a solid "innovation infrastructure" that fosters and supports technological innovation. Many have high levels of domestic and foreign immigration of highly skilled knowledge workers seeking good employment opportunities and a good quality of life.

While top-ranking states tend to be wealthier (there is a strong and positive correlation of 0.79 between their 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 most in making the transition to the New Economy are West Virginia and Mississippi, with nearly identical ranks in 2002. 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 – especially those with a high quality of life.

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 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 they are structured in accordance to New Economy factors.

How closely do high scores correlate with economic growth? States that score higher appear to create jobs at a slightly faster rate than lower ranking states. Between 1999 and 2005, there was a modest positive correlation (0.15) between the rate of employment growth and New Economy scores. Job creation, however, is not necessarily the best measure of long-term economic well-being, especially if growth comes in the form of low paying jobs. Growth in per capita income provides a more accurate picture of economic health. Higher New Economy scores were positively correlated with higher absolute growth in state per capita incomes between 1999 and 2005 (0.44), in spite of the slowdown of 2001 which hit the most technology-intensive New Economy states the hardest. Yet, there are other paths to high income growth, at least in the near 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 mining, 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.

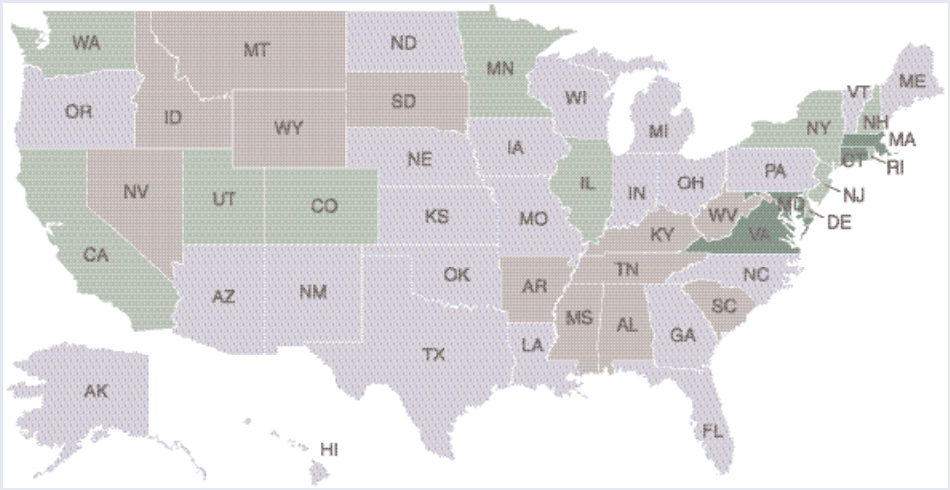
Rank	State	Score
1	Massachusetts	17.44
2	Connecticut	16.45
3	Virginia	16.05
4	Maryland	14.93
5	New York	13.66
6	Minnesota	13.59
7	New Jersey	13.49
8	Delaware	13.29
9	Washington	12.80
10	Colorado	12.75
11	New Hampshire	12.37
12	Illinois	11.43
13	Rhode Island	10.98
14	California	10.89
15	Utah	10.75
16	Pennsylvania	9.99
17	Michigan	9.89
18	Iowa	9.64
19	Oregon	9.58
20	Georgia	9.51
21	Alaska	9.07
22	Ohio	9.01
23	Arizona	8.86
24	Wisconsin	8.83
25	Missouri	8.82
26	Nebraska	8.72
27	Vermont	8.70
28	Kansas	8.37
29	North Dakota	8.28
30	Florida	8.02
31	North Carolina	7.91
32	Maine	7.90
33	Texas	7.81
34	Indiana	7.69
35	Hawaii	7.41
36	Oklahoma	7.17
37	New Mexico	6.66
38	Louisiana	6.56
39	South Carolina	6.42
40	Alabama	6.35
41	Montana	5.93
42	Arkansas	5.93
43	Tennessee	5.57
44	Idaho	5.52
45	Kentucky	5.03
46	South Dakota	4.85
47	Wyoming	4.47
48	Nevada	4.43
49	West Virginia	3.16
50	Mississippi	2.93
	U.S. Average	10.00

KNOWLEDGE JOBS

Workers who were skilled with their hands and could reliably work in repetitive and sometimes physically demanding jobs were the engine of the old economy. In today's New Economy, knowledge-based jobs are driving prosperity. These jobs tend to be managerial, professional, and technical positions held by individuals with at least two years of college. Such skilled and educated workers are the backbone of the states' most important industries, from high value-added manufacturing to high-wage traded services.

The "knowledge jobs" indicators in this section measure six aspects of knowledge-based employment: 1) employment in IT occupations in non-IT sectors; 2) the share of the workforce employed in managerial, professional, and technical occupations; 3) the education level of the workforce; 4) the average educational attainment of recent immigrants; 5) employment in high value-added manufacturing sectors; and 6) employment in high-wage traded services.

AGGREGATED KNOWLEDGE JOBS SCORES



Source: Authors' calculations based on the states' scores in six indicators—IT jobs; managerial, professional, and technical jobs; workforce education; immigration of knowledge workers; manufacturing value-added; and high-wage traded services.

INFORMATION TECHNOLOGY JOBS

Employment in IT occupations in non-IT industries as a share of total jobs.[48]

Why Is This Important? The information technology revolution continues to transform the economy, as organizations in all industries use IT to find new ways to boost productivity, develop new products and services, and create new business models. IT workers, even in "traditional" industries, are bringing IT to an ever-growing list of applications, from standard website design, to tracking supply and product shipments in real time, to streamlining internal office operations. In fact, because of the continuing digital transformation of the economy, IT jobs in non-IT industries grew 5.5 percent between 2003 and 2005, significantly faster than average job growth.[49] The number of IT workers in non-IT industries is a good proxy to measure the extent to which traditional industries are making use of IT.

"IT jobs in non-IT industries grew 5.5 percent between 2003 and 2005."

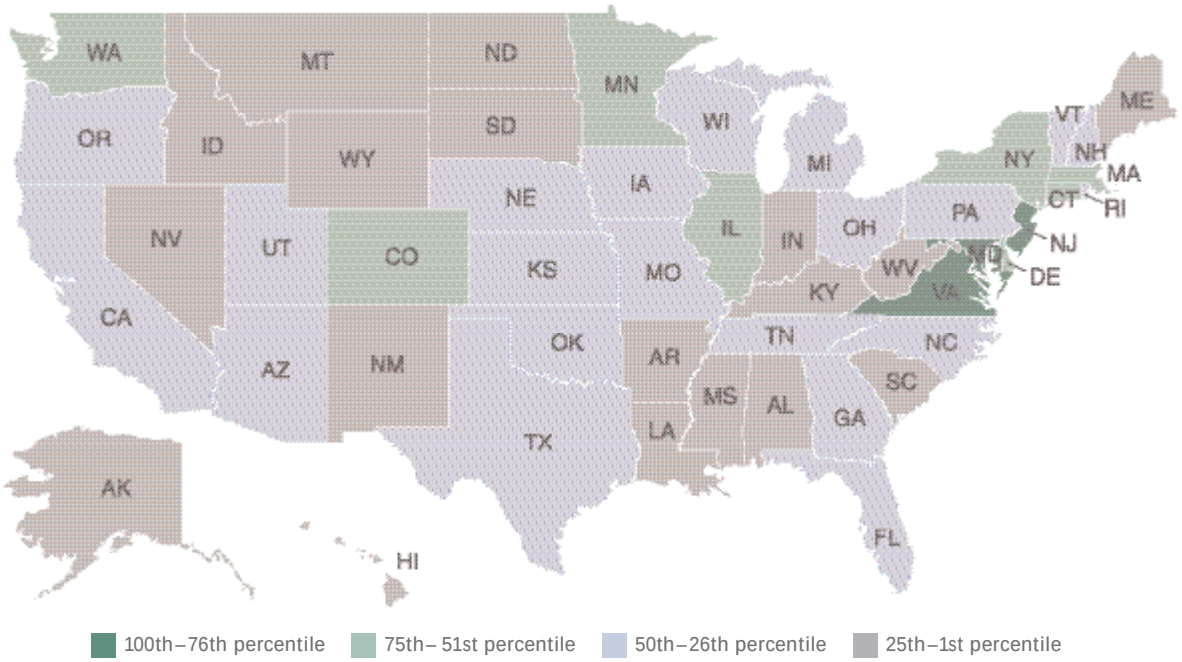
The Rankings: Even after controlling for the size of the states' software and IT-producing industries, most of the states with high scores are states with more technology-driven economies, including every one of the top five. Low scoring states tend to have natural resource-based or traditional manufacturing-based economies.

	The Top Five	Percentage of jobs in IT occupations
1	Virginia	2.36%
2	Maryland	2.06%
3	New Jersey	1.94%
4	Massachusetts	1.86%
5	Connecticut	1.83%
	U.S. Average	1.30%

Source: Bureau of Labor Statistics, 2005 data.

	The Top Five Movers	2002 Rank*	2007 Rank	Change 02-07
1	Vermont	43	32	↑11
2	New Jersey	11	3	↑ 8
2	Nebraska	22	14	↑ 8
4	Illinois	16	9	↑ 7
4	Oklahoma	36	29	↑ 7

* 2002 state ranks have been revised for data comparability.[50]



MANAGERIAL, PROFESSIONAL, AND TECHNICAL JOBS

Managers, professionals, and technicians as a share of the total workforce.

Why Is This Important? As more routine jobs are automated or offshored, and as the economy becomes more complex and knowledge-based, managers, professionals, and technicians have become increasingly important. Indeed, professional and technical jobs grew 68 percent faster than overall employment between 1999 and 2005. These include engineers and scientists, health professionals, lawyers, teachers, accountants, bankers, consultants, and engineering technicians.[51] Managerial jobs, although they have declined by a quarter since 1999, perhaps in part due to the slowdown after 2000, are still key drivers of growth and innovation.

The Rankings: States with high rankings tend to have a large number of technology and professional service companies, such as Massachusetts, Connecticut, New Jersey, and New York. In Connecticut, for example, Hartford is home to insurance and defense headquarters, while Southwestern Connecticut is dominated by corporate headquarters (such as Pitney Bowes), financial services, and high-tech jobs – many of which have moved out of New York City. But many of the leading states, such as California, Colorado, Maine, and Oregon, also have a high quality of life, reinforcing the link between quality of life and knowledge jobs. Lower-scoring states tend to be more rooted in agriculture, traditional manufacturing, or tourism.

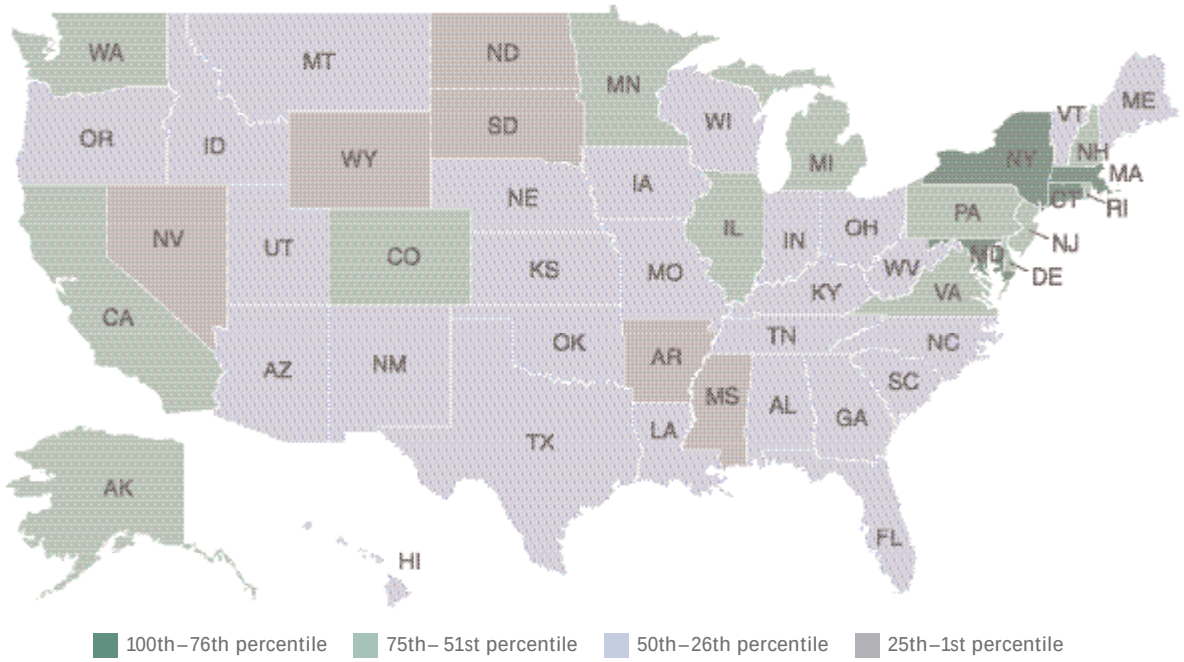
"Professional and technical jobs grew 68 percent faster than overall employment between 1999 and 2005."

	The Top Five	Percentage of jobs held by managers, professionals, and technicians
1	Massachusetts	26.8%
2	Maryland	24.8%
3	Connecticut	24.5%
4	New York	23.9%
5	New Jersey	23.6%
	U.S. Average	21.0%

Source: Bureau of Labor Statistics, 2005 data.

	The Top Five Movers	1999 Rank[52]	2002 Rank*	2007 Rank	Change 02-07
1	Vermont	32	46	28	↑18
2	Rhode Island	19	20	6	↑14
2	Alaska	20	29	15	↑14
4	Utah	39	34	23	↑11
4	Oklahoma	26	36	25	↑11

* 2002 state ranks have been revised for data comparability.



WORKFORCE EDUCATION

A weighted measure of the educational attainment (advanced degrees, bachelor's degrees, associate's degrees, or some college coursework) of the workforce.[53]

Why Is This Important? In the New Economy, an educated workforce is critical to increasing productivity and fostering innovation. Fortunately, the American workforce has become more educated in the last half century to meet the economy's increased need for skilled workers. In 2005, 27 percent of Americans over the age of 25 held at least a bachelor's degree, up from 24 percent in 2000, 21 percent in 1990, and 16 percent in 1980.

The Rankings: Highly educated individuals are more geographically mobile than less educated individuals.[54] The leading states can attract and sustain educated populations by offering an abundance of highly skilled employment and a high quality of life. Colorado attracts individuals from other regions that are, on average, more educated than those heading to other fast growing Western states. Likewise, Virginia and Maryland are sustained in part by immigration of more educated individuals to the Washington, D.C. region.[55]

"In 2005, 27 percent of Americans over the age of 25 held at least a bachelor's degree, up from 24 percent in 2000 and 21 percent in 1990."

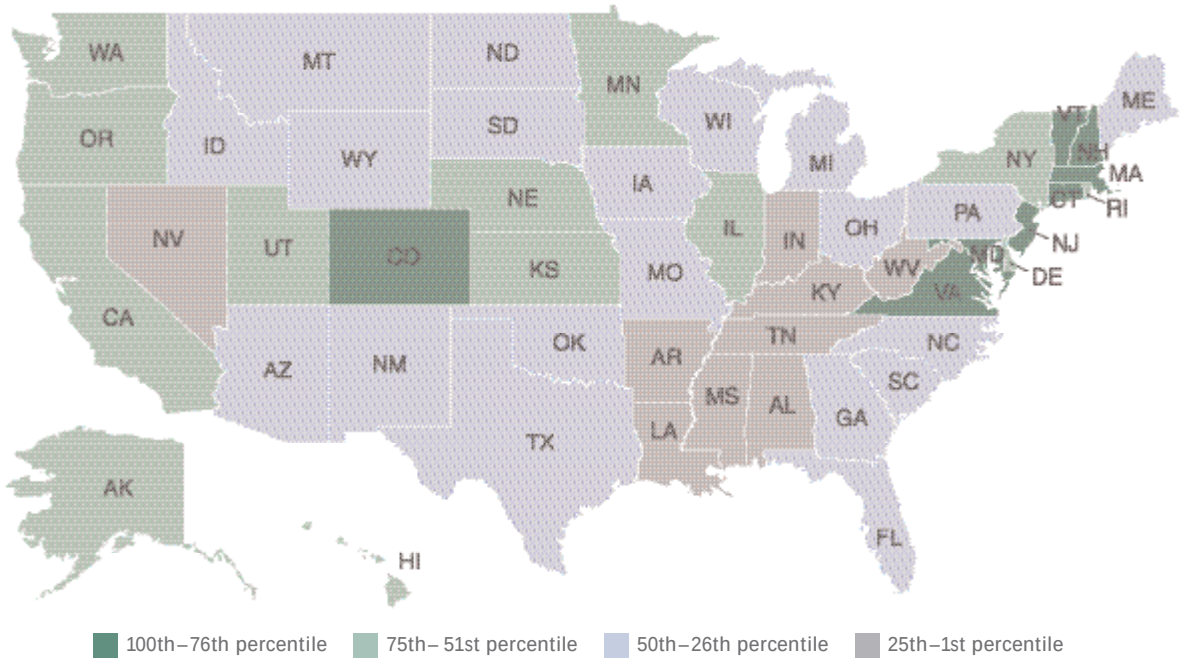
States that have strong higher education systems (such as Connecticut and Massachusetts) also score very well. Meanwhile, those that have historically invested less in education (like Alabama, Louisiana, Mississippi, and Nevada) tend to fall near the bottom.

	The Top Five	Composite score
1	Massachusetts	52.4
2	Colorado	50.0
3	Maryland	49.5
4	Connecticut	49.4
5	Virginia	47.1
	U.S. Average	39.7

Source: U.S. Census, 2005 data.

	The Top Five Movers	1999 Rank[56]	2002 Rank*	2007 Rank	Change 02-07
1	New Mexico	21	47	26	↑21
2	Arizona	12	41	23	↑18
3	California	5	29	12	↑17
4	Nebraska	26	35	21	↑14
5	Georgia	35	37	24	↑13

* 2002 state ranks have been revised for data comparability.



IMMIGRATION OF KNOWLEDGE WORKERS

The average educational attainment of recent migrants from abroad.[57]

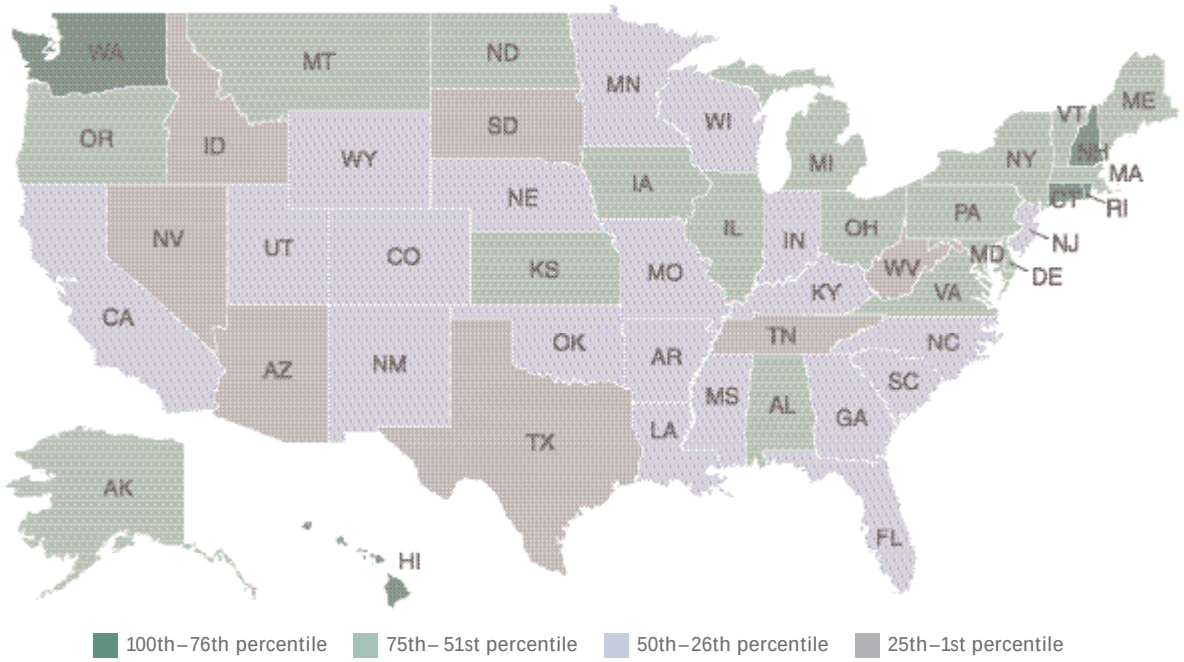
Why Is This Important? To succeed in the new global economy, states must have people with the right skills, educational background, and talent. And in a world with ever-increasing flows of talent across national borders, a small, but growing share of states' knowledge workers are from overseas. In many cases, these workers do more than merely fill occupational gaps: by contributing new perspectives and knowledge drawn from other places, they enhance a state's innovation.[58] Foreign-born and foreign-educated scientists and engineers in the United States, for example, are overrepresented among authors of the most cited scientific papers and inventors holding highly-cited patents.[59] Likewise, foreign-born entrepreneurs are involved in over 25 percent of high-tech start-up companies.[60]

"Foreign-born and foreign-educated scientists and engineers in the United States are overrepresented among authors of the most cited scientific papers and inventors holding highly-cited patents."

The Rankings: States that have strong corporate and high-tech centers tend to score the highest. Northeastern states generally score in the top half of the rankings, in part because they do not receive large flows of unskilled immigrants, as do many other states, particularly those in the West and Southwest. Notably, Hawaii and Washington rank 4th and 5th, respectively. In both cases, the reason may be larger numbers of Asian immigrants, who on average have more years of education than immigrants from Latin American nations.

	The Top Five	Average years of education
1	New Hampshire	15.34
2	Connecticut	14.84
3	Rhode Island	14.63
4	Hawaii	14.59
5	Washington	14.58
	U.S. Average	13.50

Source: U.S. Census, 2005 data.



MANUFACTURING VALUE-ADDED

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.[61]

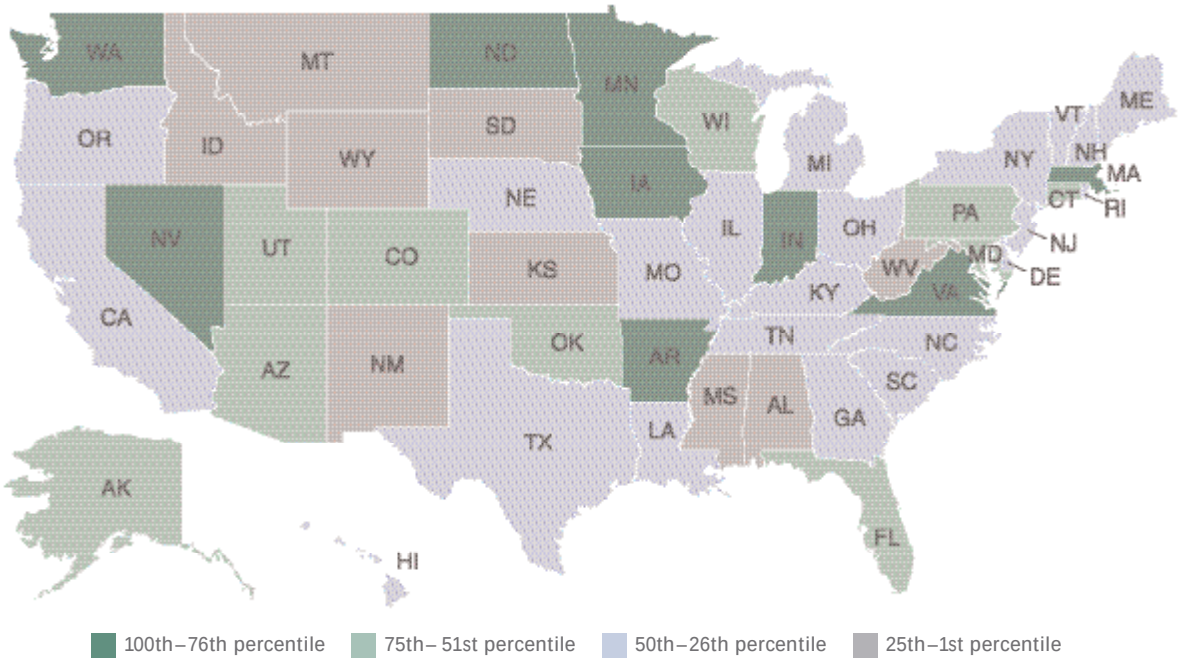
Why Is This Important? Value-added is the difference in value between inputs into the production process (e.g., materials, energy) and the value of final products or services sold. Within manufacturing, high value-added sectors tend to be those that are capital intensive and producing technologically complex products. Within sectors, firms with higher value-added levels tend to invest more in new machines and equipment (including IT software), and worker skills. These firms, all else being equal, are better equipped to meet competitive challenges, both at home and abroad. Moreover, because their workers are more productive, generating greater value for each hour worked, they in turn typically earn higher wages than other workers.

"Workers in high value-added manufacturing sectors are more productive, generating greater value for each hour worked, and in turn typically earn higher wages than other workers."

The Rankings: States with manufacturing sectors dominated by firms concentrated in a small number of industries tend to score the highest. For this reason, Indiana tops the list with its strength in metal production and automotive manufacturing. Massachusetts is buoyed by technology and plastics manufacturing, while Boeing's aerospace manufacturing is largely responsible for Washington's high ranking. In North Dakota, food production and machinery manufacturing support the state's manufacturing sector. Virginia stands out as an exception to the rule, as a wide range of industries are responsible for its strong performance. However, California, with its large and diversified manufacturing base falls near the middle (20th).

	The Top Five	Percentage of manufacturing workforce
1	Indiana	48.7%
2	Massachusetts	46.8%
3	Washington	46.7%
4	Virginia	45.9%
5	North Dakota	43.5%
	U.S. Average	26.9%

Source: U.S. Census, 2003 data.



HIGH-WAGE TRADED SERVICES

The share of employment in traded service sectors in which the average wage is above the national median for traded services.[62]

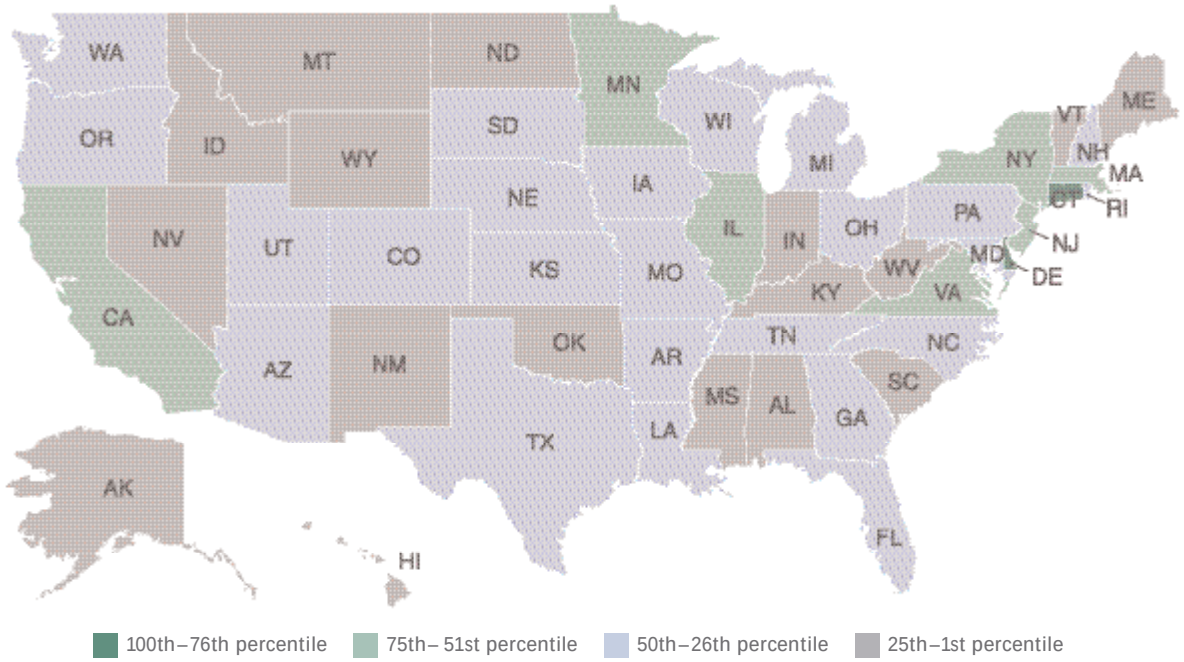
Why Is This Important? The service sector consists of more than just local-serving, low wage industries like fast food establishments. From insurance and financial services to publishing and goods transportation, traded services – those that are not primarily consumed locally – accounted for 22 percent of private sector employment in 2005. And many of these, like investment services, publishing, legal services, advertising, and shipping, pay wages above the national average. Moreover, in the New Economy, services are increasingly the only part of a region's economic base (firms that sell most of their output outside the region) that are growing in employment. Indeed, the IT revolution is enabling a growing share of information-based services to be physically distant from the customer while remaining functionally close. In the old economy, services like banking and book sales were local-serving industries. In the New Economy, these and a host of other industries are now traded, as consumers can use the Internet and telephone to consume these services from companies not necessarily located in their community.

The Rankings: Large, traditional centers of business activity lead the rankings. Delaware's strategy to attract credit card and banking industries has helped propel it to the top of the rankings. Connecticut hosts a large number of insurance companies and law firms, while the New York metropolitan area is home to a wide array of corporate headquarters, financial services, and publishing. States near the bottom of the rankings, such as Wyoming, Montana, and West Virginia, tend to have economies more heavily based on resource-dependent industries and traditional manufacturing.

The Top Five		Percentage of service jobs in high-wage traded sectors
1	Delaware	24.3%
2	Connecticut	20.2%
3	New York	19.6%
4	Minnesota	17.7%
5	New Jersey	17.3%
	U.S. Average	14.5%

Source: Bureau of Labor Statistics, 2005.

"Traded services account for 22 percent of all industry employment."



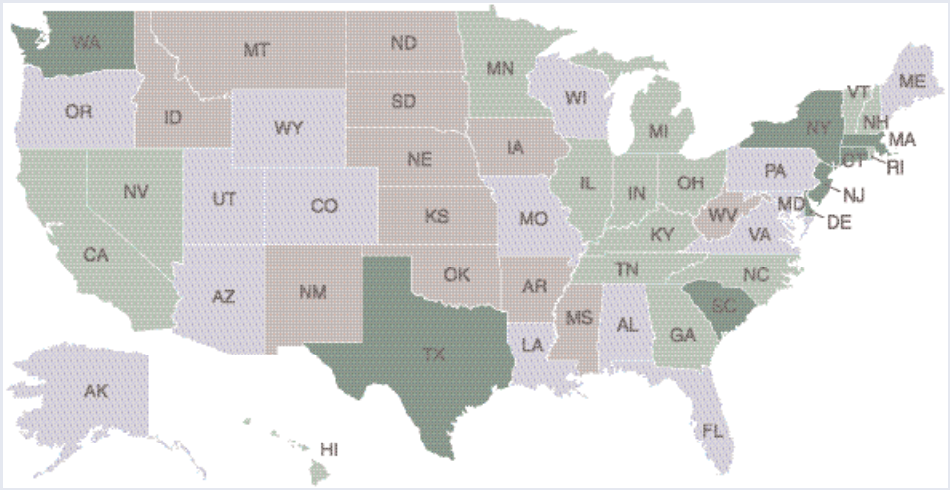
GLOBALIZATION

While the old economy was national in scope, the New Economy is global. In 1975 there were about 7,000 multi-national companies, while today there are approximately 40,000.[63] The net income of U.S. companies from operations outside the United States accounts for about half of income earned at home, compared to just 10 percent in the 1950s.[64] It is now a competitive requirement that fast growing as well as established mid-sized and larger businesses invest all over the globe to access markets, technology, and talent.

When the old economy emerged after World War II, the winners were states whose businesses sold to national markets, as opposed to local or regional ones. In the New Economy of the 21st century, the winners will be the states whose businesses are most integrated into the world economy. A global orientation ensures expanding markets for a state's industries. Since the workforce of globally-oriented firms also earns more than those at other firms, a global orientation means that a state's workforce will have a higher standard of living.

The globalization indicators in this section measure three aspects of globalization: 1) the extent to which the state's manufacturing and service workforce is employed producing goods and services for export [65]; 2) the share of the workforce employed by foreign-owned companies; and 3) the number of packages exported.

AGGREGATED GLOBALIZATION SCORES



100th–76th percentile | 75th–51st percentile | 50th–26th percentile | 25th–1st percentile

Source: Authors' calculations based on the states' scores in three indicators—export focus of manufacturing, foreign direct investment, and package exports.

Rank	State	Score
1	Washington	12.83
2	Delaware	12.70
3	Texas	12.44
4	Massachusetts	12.25
5	South Carolina	12.06
6	New Jersey	11.80
7	New York	11.51
8	Connecticut	11.26
9	Vermont	11.04
10	Kentucky	10.66
11	New Hampshire	10.60
12	Illinois	10.58
13	Rhode Island	10.42
14	Georgia	10.17
15	California	10.14
16	Michigan	10.13
17	North Carolina	9.93
18	Nevada	9.89
19	Tennessee	9.81
20	Minnesota	9.71
21	Ohio	9.62
22	Indiana	9.59
23	Hawaii	9.54
24	Pennsylvania	9.39
25	Florida	9.39
26	Alaska	9.30
27	Arizona	9.12
28	Oregon	9.10
29	Maine	8.93
30	Maryland	8.91
31	Virginia	8.79
32	Utah	8.71
33	Wisconsin	8.64
34	Louisiana	8.58
35	Wyoming	8.58
36	Alabama	8.42
37	Colorado	8.35
38	Missouri	8.18
39	Iowa	7.84
40	North Dakota	7.77
41	West Virginia	7.69
42	Kansas	7.53
43	Idaho	7.48
44	New Mexico	7.46
45	Nebraska	7.39
46	Oklahoma	7.22
47	Arkansas	7.01
48	Mississippi	6.58
49	South Dakota	6.48
50	Montana	6.23
	U.S. Average	10.00

EXPORT FOCUS OF MANUFACTURING AND SERVICES

The value of exports per manufacturing and service worker.[66]

Why Is This Important? Trade has become an integral part of the U.S. and world economies. The combined total of U.S. exports and imports has increased from just 11 percent of GDP in 1970 to 20 percent in 1990, reaching 25 percent in 2004. Service exports are growing even faster than goods exports, accounting for 30 percent of total exports in 2005, up from 18 percent in 1980.[67] 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.[68] As a result, states whose companies are not global traders risk being left behind.

The Rankings: Because of the limited availability of service export data, service exports account for only 6 percent of total exports analyzed. Therefore, the leading states are generally those that have high value-added, technologically advanced manufacturing sectors, such as Washington, Texas, Vermont, and New York. Even after holding constant industry sectors' propensity to export, the manufacturing firms in these states export more. Washington's top rank also demonstrates the importance of software publishing (a service industry), as Microsoft's software exports, together with Boeing's aerospace manufacturing, are largely responsible for its strong performance. Texas' high rank is owed in part to its extensive trade with Mexico, which is the destination for nearly 40 percent of its manufacturing exports, compared to a state average of 14 percent. States with low rankings tend to have more lower value-added industries that compete directly with lower-wage nations, making it more difficult to export (e.g. Arkansas and Mississippi) or with mostly smaller firms that tend to export less than larger firms (such as Rhode Island).

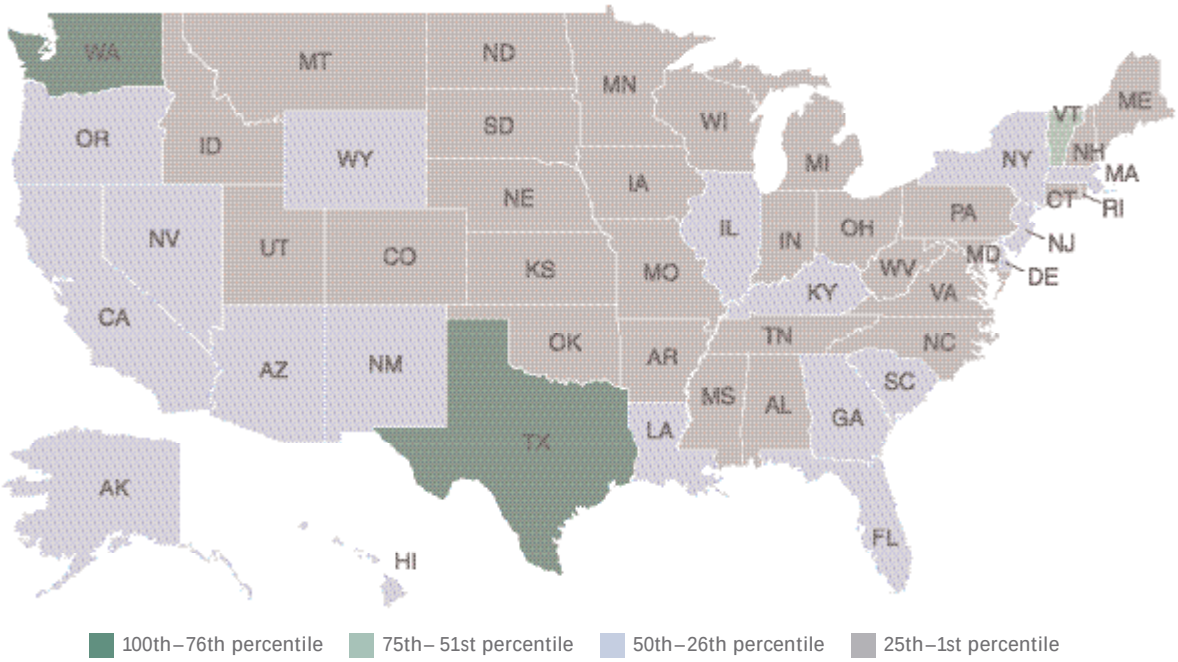
> "Service exports are growing even faster than goods exports, accounting for 30 percent of total exports in 2005, up from 18 percent in 1980."

The Top Five		Adjusted export sales per manufacturing and service worker
1	Washington	$59,547
2	Texas	$56,256
3	Vermont	$37,574
4	Alaska	$32,277
5	Nevada	$31,758
	U.S. Average	$25,374

Source: U.S. Census, 2002 data, and U.S. Department of Commerce, 2005 data

The Top Five Movers		2002 Rank*	2007 Rank	Change 02-07
1	North Dakota	40	24	↑16
2	South Carolina	29	15	↑14
3	Utah	36	23	↑13
4	Nevada	15	5	↑10
4	Maine	47	37	↑10

* 2002 state ranks have been revised for data comparability.[69]



FOREIGN DIRECT INVESTMENT

The percentage of each state's workforce employed by foreign companies.

Why Is This Important? Incoming foreign direct investment (FDI) includes significant investments by foreign companies in new facilities in the United States that employ workers in economic-base activities. FDI grew rapidly in the late 1990s, reaching an apex in 2000 of $336 billion, before dropping precipitously to $52 billion in 2002. Since then, FDI has rebounded by 50 percent to $77 billion in 2005 (all in 2000 dollars).[70]

The Rankings: Most states that score well are on the East Coast. This is in large part because most FDI comes from Europe and Canada. In 2004, Europe accounted for 66 percent of all FDI in the United States, with Asia accounting for less than 15 percent. European companies have invested in East Coast states in part because of their proximity to their corporate headquarters, and because of the access to densely populated markets.

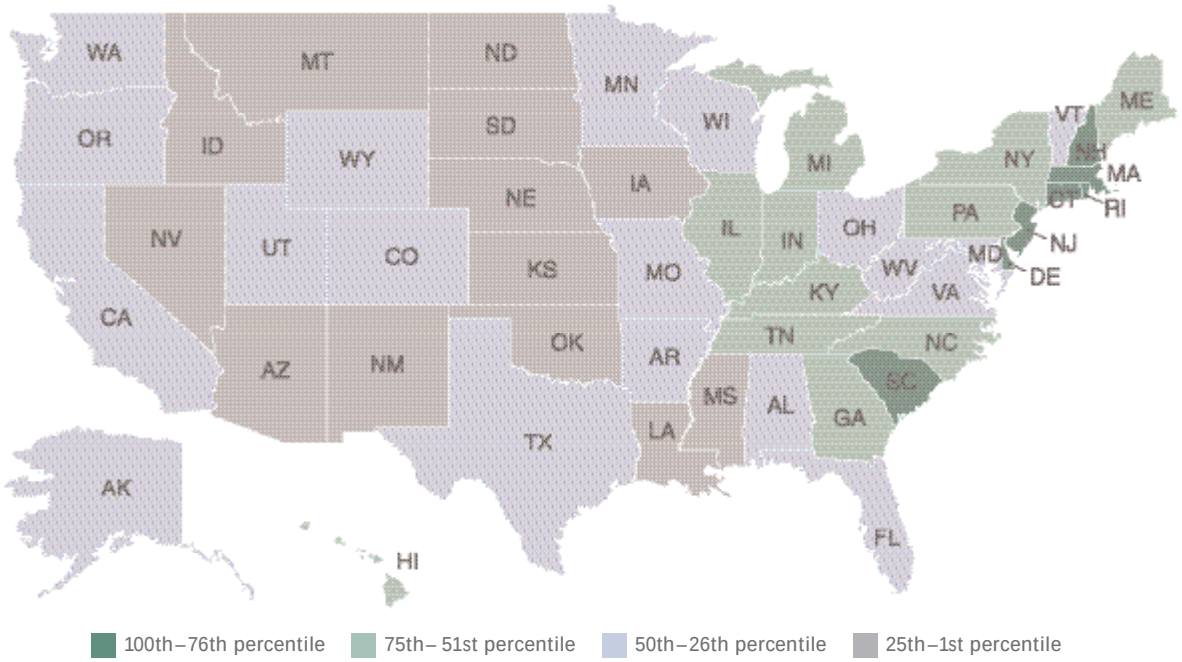
	The Top Five	Percentage of workforce employed by foreign companies
1	South Carolina	5.25%
2	Delaware	5.03%
3	New Hampshire	5.00%
4	Connecticut	4.80%
5	Massachusetts	4.51%
	U.S. Average	2.99%

Source: Bureau of Economic Analysis, 2004 data.

	The Top Five Movers	1999 Rank	2002 Rank*	2007 Rank	Change 02-07
1	Wyoming	41	45	29	↑16
2	Rhode Island	18	20	7	↑13
3	Alaska	24	35	25	↑10
4	Iowa	42	46	40	↑ 6
5	Maryland	21	24	19	↑ 5

* 2002 state ranks have been revised for data comparability.

"After falling from $336 billion in 2000, incoming FDI has rebounded from $52 billion in 2002 to $77 billion in 2005 (in 2000 dollars), a 50 percent increase."



PACKAGE EXPORTS

The number of UPS packages exported per worker.

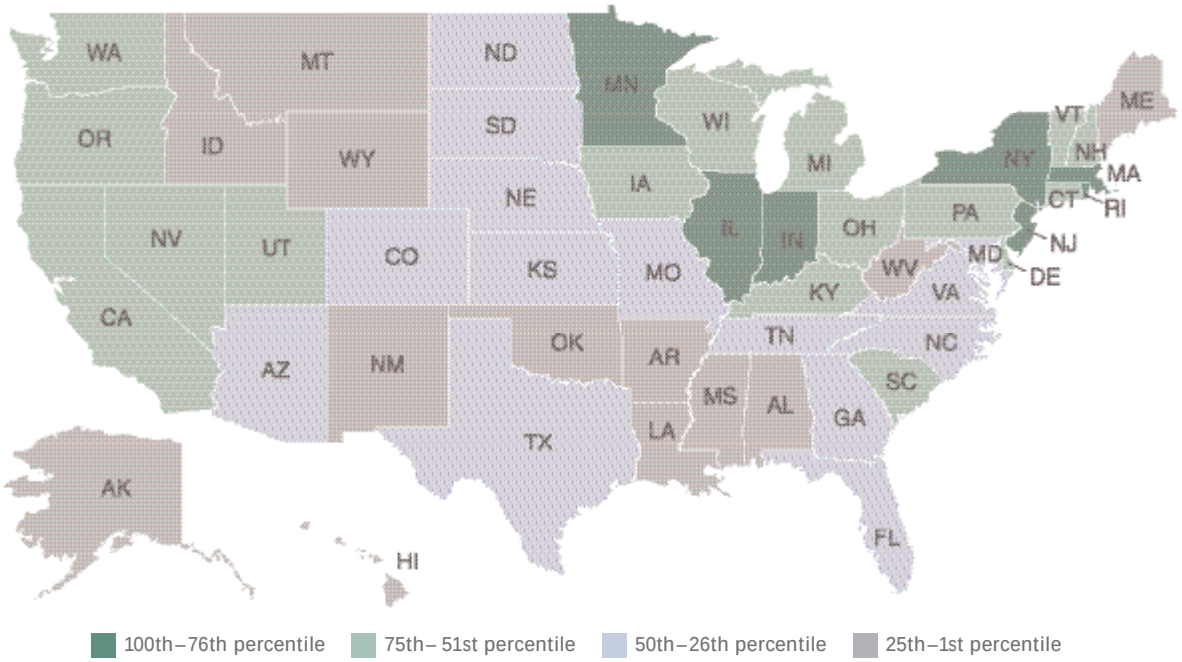
Why Is This Important? Many firms are becoming more international as they pursue new markets and establish offices and supply networks around the world. International trade in services – including goods transportation, royalties, financial, and business and technical services – has increased significantly in the last decade. In fact, U.S. affiliates' combined intrafirm payments and receipts for international shipping have tripled since 1997, from $840 million to $2.5 billion in 2005 (in 2000 dollars).[71] The number of package exports is one indicator that measures the extent to which a state's firms have expanded global linkages, capitalizing on this trend.

The Rankings: States with the highest levels of package exports are not necessarily the same states that lead in value of exports per worker.[72] Rather, some are home to corporate headquarters of global firms, such as Illinois, Massachusetts, Minnesota, New Jersey, and New York. Others, like Rhode Island, have high levels of foreign direct investment.

	The Top Five	Annual number of package exports per employee
1	Minnesota	0.25
2	Rhode Island	0.25
3	New Jersey	0.22
4	Massachusetts	0.21
5	Illinois	0.21
	U.S. Average	0.14

Source: United Parcel Service, 2003 data.

"U.S. affiliates' combined intrafirm payments and receipts for international shipping have tripled since 1997, from $840 million to $2.5 billion in 2005 (in 2000 dollars)."

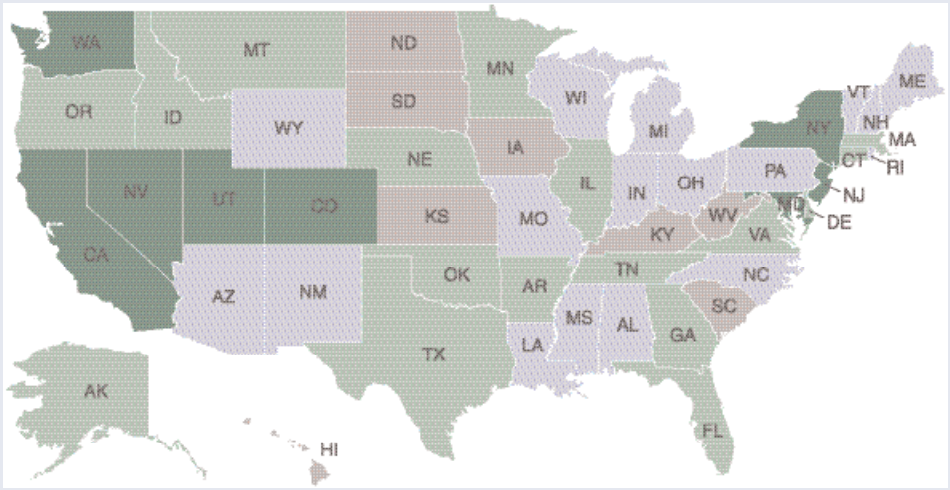


ECONOMIC DYNAMISM

The old economy was epitomized by large companies facing limited competition in stable markets with high barriers to entry. The New Economy is about economic dynamism and competition, epitomized by the fast growing, entrepreneurial companies that are one of its hallmarks. As innovation has become an important determinant of competitive advantage, business start-ups and failures have accelerated. In this highly competitive environment, the ability of state economies to rejuvenate themselves through the formation of new, innovative companies is critical to their economic vitality.

The dynamism and competition indicators in this section measure six aspects of economic dynamism: 1) jobs in fast growing gazelle firms; 2) the degree of job churning (which is a product of new business start-ups, and existing business failures); 3) the number of Deloitte Technology Fast 500 and Inc. 500 firms; 4) the number and value of companies' IPOs; 5) the number of entrepreneurs starting new businesses; and 6) the number of individual inventor patents issued.

Aggregated Economic Dynamism Scores



100th–76th percentile | 75th–51st percentile | 50th–26th percentile | 25th–1st percentile

Source: Authors' calculations based on the states' scores in six indicators— gazelle employment, job churning, fastest growing firms, initial public offerings, entrepreneurial activity, and inventor patents.

Rank	State	Score
1	Utah	13.78
2	Maryland	13.36
3	Colorado	13.23
4	California	12.92
5	New Jersey	12.74
6	Washington	12.53
7	Nevada	12.21
8	New York	11.50
9	Texas	11.19
10	Idaho	11.11
11	Massachusetts	11.04
12	Minnesota	10.97
13	Virginia	10.87
14	Nebraska	10.48
15	Florida	10.38
16	Delaware	9.96
17	Georgia	9.87
18	Alaska	9.79
19	Oklahoma	9.79
20	Tennessee	9.32
21	Oregon	9.29
22	Arkansas	9.16
23	Montana	9.16
24	Connecticut	9.12
25	Illinois	9.01
26	Arizona	8.60
27	North Carolina	8.53
28	Pennsylvania	8.37
29	Vermont	7.90
30	New Hampshire	7.87
31	New Mexico	7.75
32	Wyoming	7.56
33	Michigan	7.55
34	Maine	7.54
35	Indiana	7.51
36	Wisconsin	7.33
37	Missouri	7.30
38	Ohio	7.05
39	Rhode Island	6.92
40	Mississippi	6.87
41	Louisiana	6.68
42	Alabama	6.42
43	North Dakota	6.20
44	South Carolina	6.13
45	Kansas	6.11
46	Hawaii	6.04
47	South Dakota	6.00
48	Iowa	5.59
49	Kentucky	5.41
50	West Virginia	3.86
	U.S. Average	10.00

"GAZELLE" JOBS

Jobs in gazelle companies (firms with annual sales revenue that has grown 20 percent or more for four straight years) as a share of total employment.[73]

Why Is This Important? 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. In fact, it is the relatively small number of fast growing firms of all sizes that accounted for the lion's share of new jobs created in the 1990s. Between 1993 and 1999, the number of gazelles grew almost 40 percent, to more than 350,000. One study estimates that such gazelles (termed "high expectations entrepreneurs") are responsible for 80 percent of the jobs created by entrepreneurs.[74]

The Rankings: The high-ranking states in the *2002 Index* tended to be high-tech centers of entrepreneurial activity (Massachusetts, Washington, and California). For the *2007 Index*, the measured period of gazelle growth begins at the end of 2001, soon after the collapse of the Internet bubble had hit the tech sectors in those states the hardest. This may explain why they do not rank nearly as high in 2007. Instead, a number of other states experienced high levels of gazelle employment growth. Especially in smaller states, a relatively small number of extremely fast growing gazelles can account for a large percentage of state gazelle employment. This phenomenon may be at work in Nebraska and Delaware, the two top ranking states, and Alaska, which ranks 11th. More remote agricultural, natural resource, and tourism-dependent states (e.g., West Virginia, Hawaii, and Wyoming) tend to produce fewer gazelles.

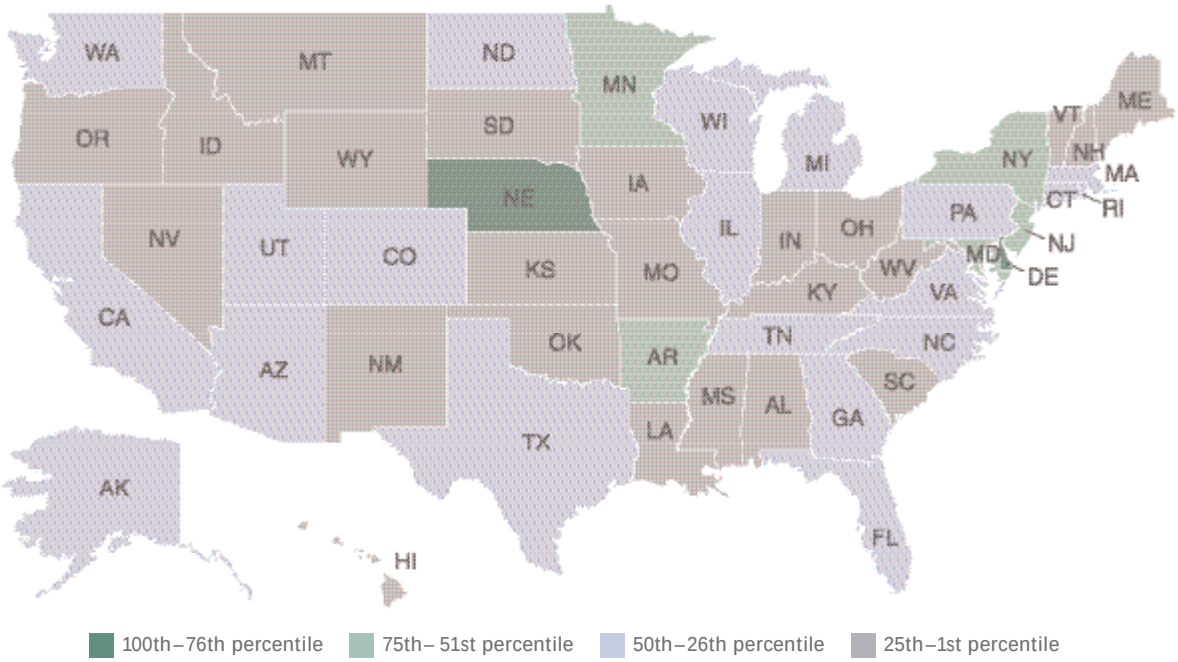
"Gazelles are responsible for as much as 80 percent of the jobs created by entrepreneurs."

	The Top Five	Jobs in fast growing companies as a percentage of total employment
1	Nebraska	16.63%
2	Delaware	13.48%
3	New York	11.69%
4	Maryland	11.65%
5	Arkansas	11.32%
	U.S. Average	8.03%

Source: National Policy Research Council, 2006 data.

	The Top Five Movers	1999 Rank[75]	2002 Rank*	2007 Rank	Change 02-07
1	Arkansas	16	41	5	↑36
2	Nebraska	18	36	1	↑35
2	Alaska	49	46	11	↑35
4	Delaware	39	25	2	↑23
5	North Dakota	45	48	26	↑22

* 2002 state ranks have been revised for data comparability.



JOB CHURNING

The number of new start-ups and business failures, combined, as a share of the total firms in each state.[76]

Why Is This Important? Steady growth in employment masks the constant churning of job creation and destruction, as less innovative and efficient companies downsize or go out of business and more innovative and efficient companies grow or take their place. Almost 1 million jobs were added to the economy between 2002 and 2003, but that was after start-up firms had created 6.4 million jobs and failing firms had eliminated 6.1 million others.[77] This process of dynamic equilibrium is a result of the highly competitive reality of the New Economy. While such turbulence increases the economic risk faced by workers, companies, and even regions, it also helps drive economic innovation and growth.

The Rankings: Some fast growing states (like Florida, Idaho, Nevada, Tennessee and Utah) have experienced a great deal of churning. In part, this is because fast growing economies produce more start-ups, especially in local-serving industries (such as restaurants, dry cleaners, or accountants). But a high churn rate also reflects a dynamism that leads to the death of old, outmoded firms and the creation of innovative new companies that sell beyond the state's borders. States with somewhat slower overall growth rates, but with dynamic business sectors, such as Washington, Maryland, and New Jersey also see high rates of churn.

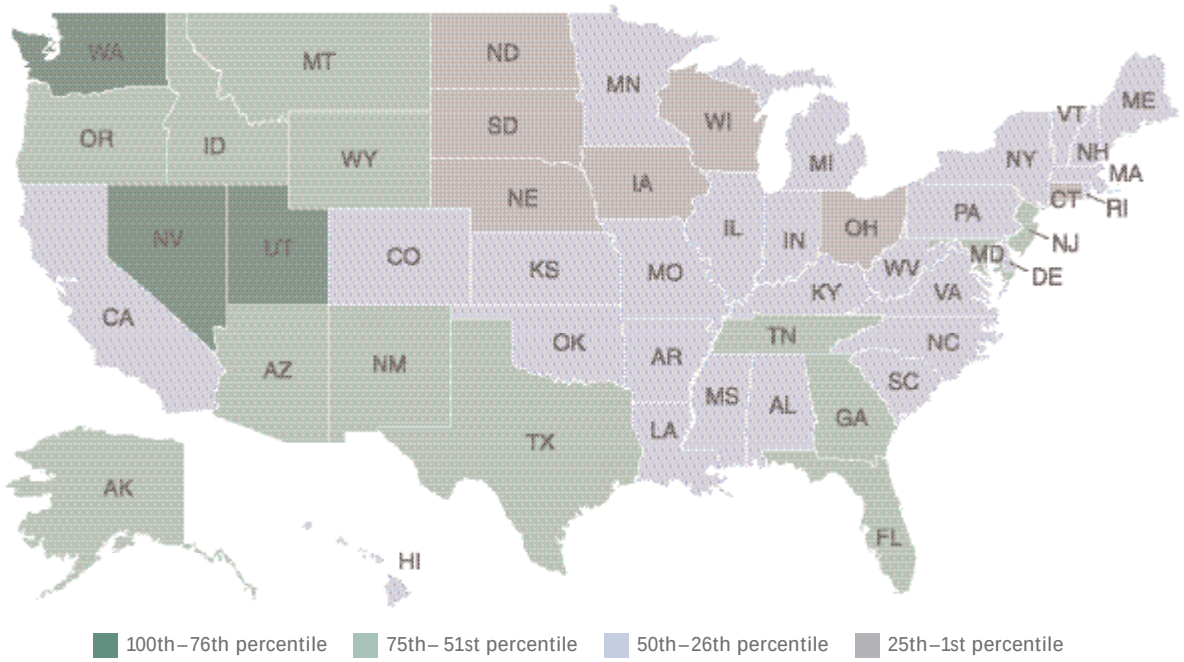
"Almost 1 million jobs were added to the economy between 2002 and 2003, but that was after start-up firms had created 6.4 million jobs and failing firms had eliminated 6.1 million others."

	The Top Five	Business start-ups and failures as a percentage of total firms
1	Nevada	38.1%
2	Washington	37.2%
3	Utah	36.7%
4	Maryland	31.2%
5	Tennessee	30.8%
	U.S. Average	25.4%

Source: U.S. Small Business Administration, 2003-2004 data.

	The Top Five Movers	1999 Rank[78]	2002 Rank*	2007 Rank	Change 02-07
1	Pennsylvania	19	47	26	↑21
2	West Virginia	37	42	22	↑20
3	Maryland	9	22	4	↑18
4	New Jersey	4	25	8	↑17
5	Tennessee	17	19	5	↑14

* 2002 state ranks calculated from U.S. Census establishment data, 1997-1998.



FASTEST GROWING FIRMS

The number of Deloitte Technology Fast 500 and Inc. 500 firms as a share of total firms.[79]

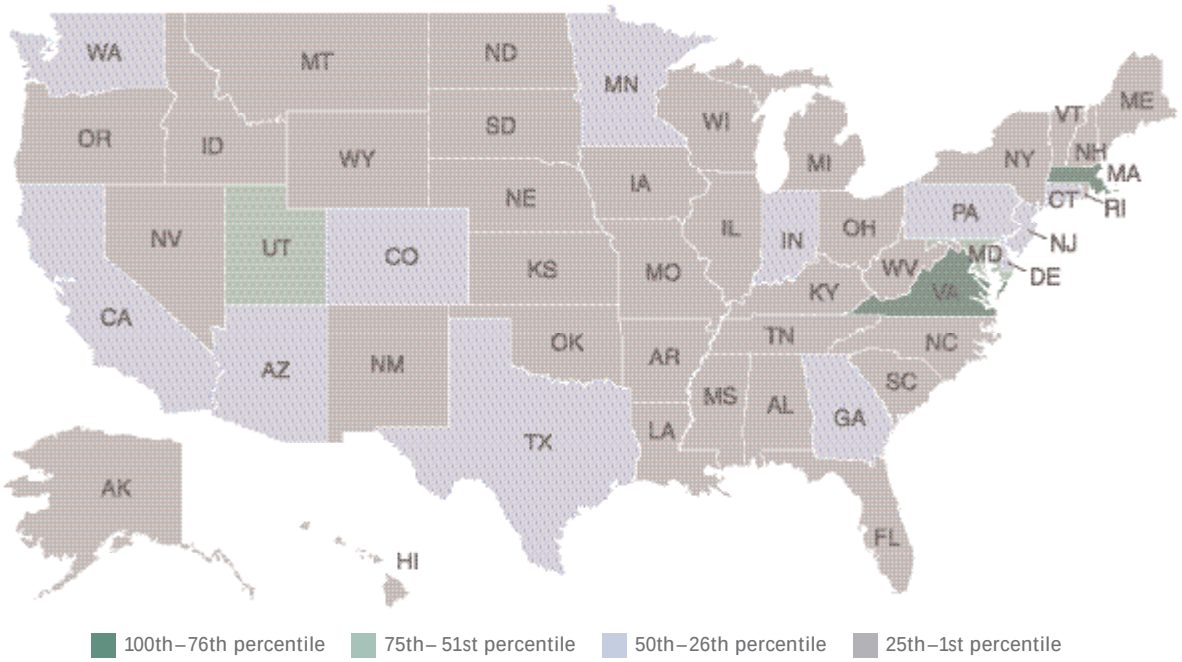
Why Is This Important? The Fast 500 and Inc. 500 lists are composed of the fastest growing "super" gazelle firms. Every firm to make the 2006 Fast 500 list had experienced revenue growth of at least 200 percent over a four year span. For the 2006 Inc. 500, it was 300 percent in three years. While firms attaining such growth rates are generally quite small, with fewer than 100 employees, they represent a state's most successful entrepreneurial efforts and hold the most promise for continued growth. In fact, there are a number of well-known companies (including Microsoft and Paul Mitchell) that were listed on the Inc. 500 before they became household names. A state's performance in this measure is one indication of the vitality of its entrepreneurial network.

The Rankings: Not surprisingly, states that perform well are generally known for their entrepreneurial technology sectors. Indeed, the majority of Inc. 500 firms in the top states, especially Virginia and Maryland, are IT, telecommunications or medical technology firms. Virginia and Maryland are also home to a number of fast growing firms in the defense and homeland security industry. In 9th place, California falls below several other technology states, but this is not because it lacks productive entrepreneurial centers. Instead, these are just one piece of California's large, diverse economy.

The Top Five		Percentage of firms that are fast growing
1	Virginia	0.082%
2	Massachusetts	0.075%
3	Maryland	0.058%
4	Utah	0.052%
5	New Jersey	0.041%
	U.S. Average	0.026%

Source: Deloitte Fast 500 and Inc. 500, 2005 and 2006 data.

"Every firm to make the 2006 Fast 500 list had experienced revenue growth of at least 200 percent over a four year span, while those on the 2006 Inc. 500 exceeded 300 percent in three years."



INITIAL PUBLIC OFFERINGS

A weighted measure of the number and value of initial public stock offerings of companies as a share of total worker earnings.[80]

Why Is This Important? In the last two decades, financial markets have embraced entrepreneurial dynamism. One measure of this is the number of initial public offerings (first rounds of companies' stock sold when they make their debut in public markets). After growing by 50 percent since the 1960s, IPOs peaked in the 1990s. The Internet slump and economic recession reduced the number of offerings in 2001-2003 to just 20 percent of 2000 numbers. However, 2004-2006 have seen a strong rebound, with the number of IPOs more than doubling those of the previous three years, and the trend is expected to continue as the market finds an equilibrium between the exuberance of the late 1990s and the pessimism of the early 2000s.

The Rankings: Nevada has soared in the rankings, due in part to gaming industry IPOs. Other states, such as California, Massachusetts, and Texas perform well on the strength of their high-tech sectors. But the generation of companies with high growth potential is not limited to what are generally viewed as the high-tech leaders: states like Oklahoma and South Dakota also ranked high. Colorado's strong performance comes from a variety of sectors, including technology, health care, and natural resource extraction.

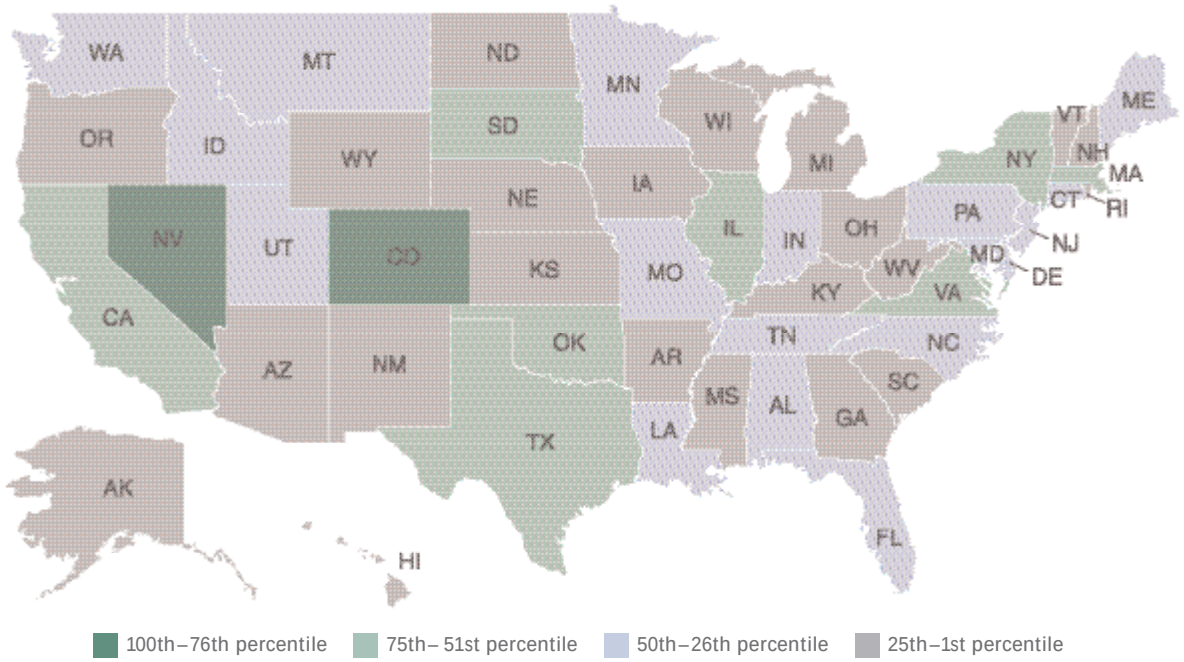
"The number of IPOs in the last three years is more than double the number in 2001-2003."

	The Top Five	IPOs score
1	Nevada	7.2
2	Colorado	6.2
3	California	6.0
4	Oklahoma	6.0
5	Massachusetts	5.8
	U.S. Average	5.0

Source: Renaissance Capital's IPOHome.com, 2004-2006 data.

	The Top Five Movers	1999 Rank[81]	2002 Rank*	2007 Rank	Change 02-07
1	Nevada	40	30	1	↑29
2	South Dakota	47	34	7	↑27
3	Idaho	34	34	12	↑22
4	Montana	47	34	20	↑14
5	Alabama	44	34	21	↑13

* 2002 state ranks have been revised for data comparability.[82]



ENTREPRENEURIAL ACTIVITY

The adjusted number of entrepreneurs starting new businesses.[83]

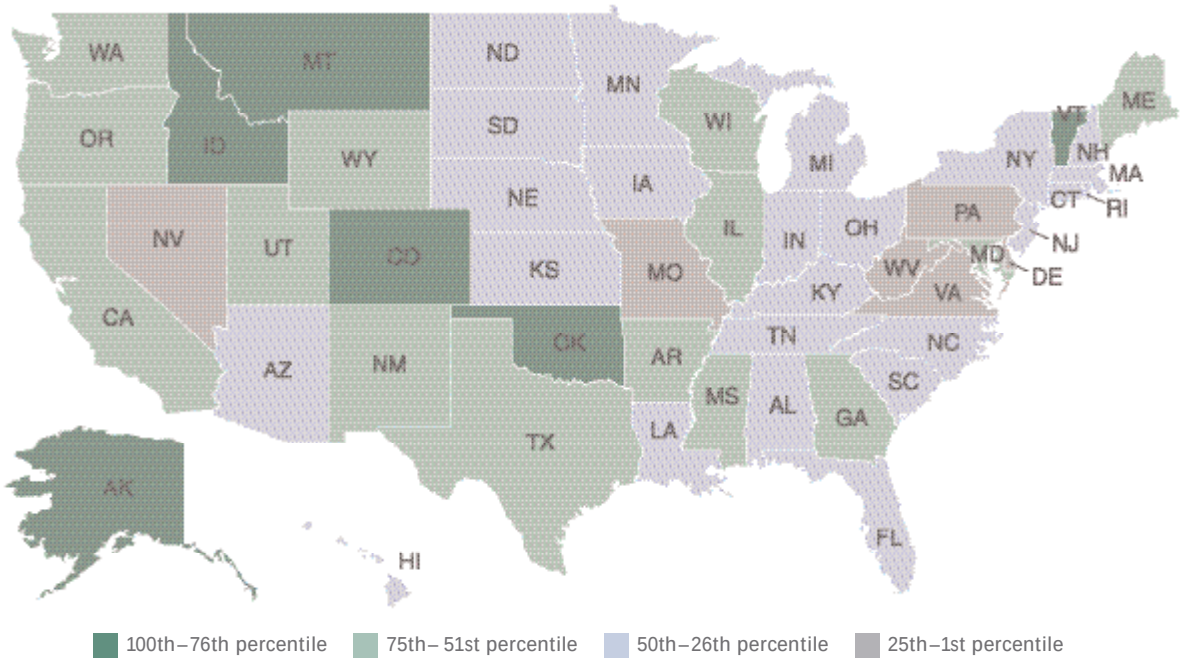
Why Is This Important? In the New Economy, competitive advantage is increasingly based on innovation and the generation of new business models. Moreover, in a global economy with low-wage developing nations, an increasingly attractive option for U.S. multinationals, fewer U.S. companies are establishing greenfield plants domestically. For both reasons, entrepreneurial activity is more important to state economic well-being than it was even a decade ago. Although only one in twenty entrepreneurial firms is high-growth in terms of adding jobs, firms that survive the first few years create jobs and also often innovative goods, services, and processes.[84]

The Rankings: Many smaller, rural states, including Vermont, Montana, Idaho, Alaska, and Maine rank highly. This may be a product of rural necessity: with fewer traditional employment opportunities, people in rural areas are more likely to engage in entrepreneurial activity. Moreover, even after controlling for different state growth rates, because fast growing states provide a disproportionate number of entrepreneurial opportunities, the rankings may reflect some residual growth effects that have not been accounted for. The education level of a state's workforce and its entrepreneurial activity are at least modestly correlated (0.16), which may explain why states with highly educated workforces such as Colorado and Vermont score highly. However, there are many factors that affect levels of entrepreneurial activity, making it difficult to predict which states will fare better than others.

The Top Five		Adjusted number of entrepreneurs as a percentage of population
1	Vermont	0.46%
2	Colorado	0.44%
3	Oklahoma	0.43%
4	Montana	0.41%
5	Idaho	0.41%
	U.S. Average	0.30%

Source: Robert Fairlie, 2004-2005 data.

"Although only one in twenty entrepreneurial firms is high-growth in terms of adding jobs, firms that survive the first few years create jobs and also often innovative goods, services, and processes."



INVENTOR PATENTS

The number of independent inventor patents per 1000 people.[85]

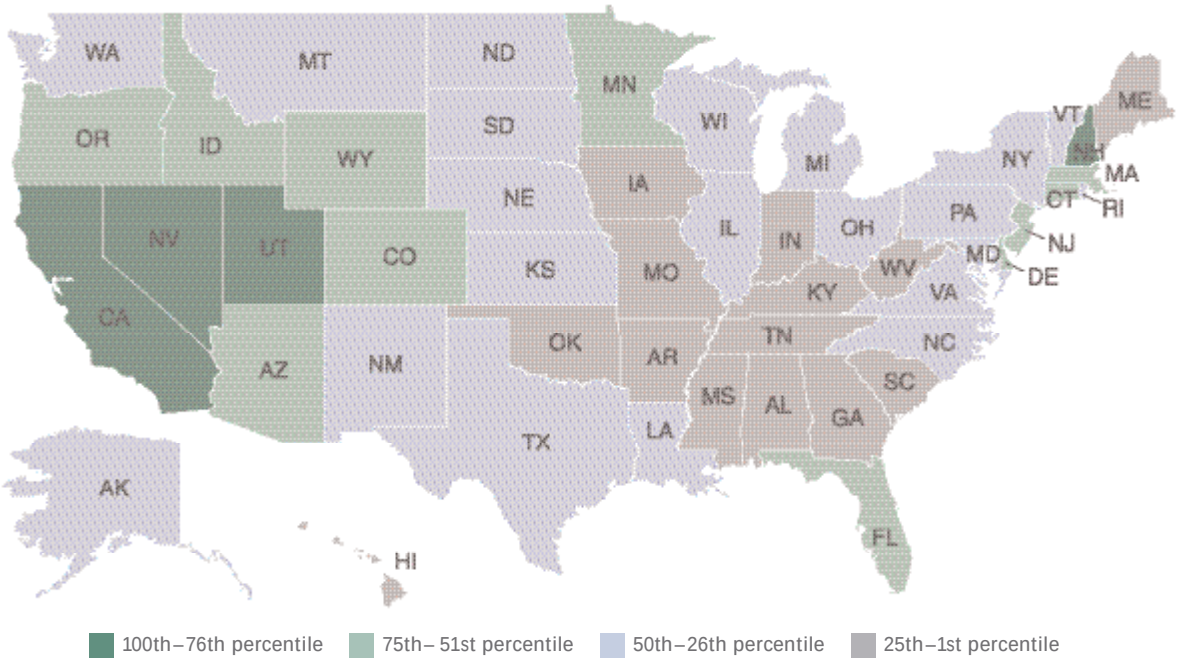
Why Is This Important? From Benjamin Franklin to Bill Gates, the independent inventor is an established American icon. Today, many owners of individual patents – those patents not assigned to any organization – are not mere tinkerers. More often, they are trained scientists, engineers, or students, pursuing independent research. Because the New Economy places a premium on innovation, this wellspring of innovative activity has become an important foundation for many entrepreneurial ventures. Indeed, in 2005, more than 14,000 inventor patents were issued. States with more inventor patents are better positioned to succeed in today's dynamic and innovative economy.

The Rankings: State scores for this indicator are correlated with the number of scientists and engineers in a state's workforce (0.33). Many of these states also have the strongest higher education science and engineering programs. States that are typically strong in tech-based entrepreneurial activity, including California, Utah, and Massachusetts, also perform well. The states generating the fewest inventor patents per capita tend to be Southeastern, with workforces rooted in agriculture and more traditional industries.

	The Top Five	Patents per 1000 people of workforce age
1	California	0.143
2	Utah	0.123
3	New Hampshire	0.119
4	Nevada	0.118
5	Minnesota	0.112
	U.S. Average	0.085

Source: U.S. Patent and Trademark Office, 2004 and 2005 data.

"In 2005, more than 14,000 inventor patents were issued."



Rank	State	Score
1	Alaska	12.49
2	Massachusetts	12.40
3	Washington	12.33
4	New Jersey	12.00
5	Florida	11.99
6	Virginia	11.91
7	Connecticut	11.79
8	California	11.27
9	Arizona	11.16
10	Nevada	11.07
11	Maryland	10.89
12	New Hampshire	10.89
13	Georgia	10.87
14	New York	10.86
15	Illinois	10.68
16	Nebraska	10.65
17	Minnesota	10.60
18	Utah	10.55
19	Maine	10.54
20	Oregon	10.39
21	Kansas	10.26
22	Colorado	10.17
23	Texas	10.07
24	Rhode Island	10.06
25	South Dakota	9.96
26	Michigan	9.82
27	Vermont	9.75
28	North Dakota	9.57
29	Pennsylvania	9.48
30	Indiana	9.40
31	Ohio	9.33
32	Wisconsin	9.26
33	Wyoming	9.03
34	Idaho	8.92
35	Iowa	8.84
36	North Carolina	8.84
37	Montana	8.76
38	Tennessee	8.62
39	Hawaii	8.61
40	Missouri	8.26
41	Delaware	8.26
42	Oklahoma	7.71
43	South Carolina	7.60
44	Louisiana	7.29
45	Kentucky	7.11
46	New Mexico	6.51
47	West Virginia	6.16
48	Arkansas	6.06
49	Alabama	5.81
50	Mississippi	4.37
	U.S. Average	10.00

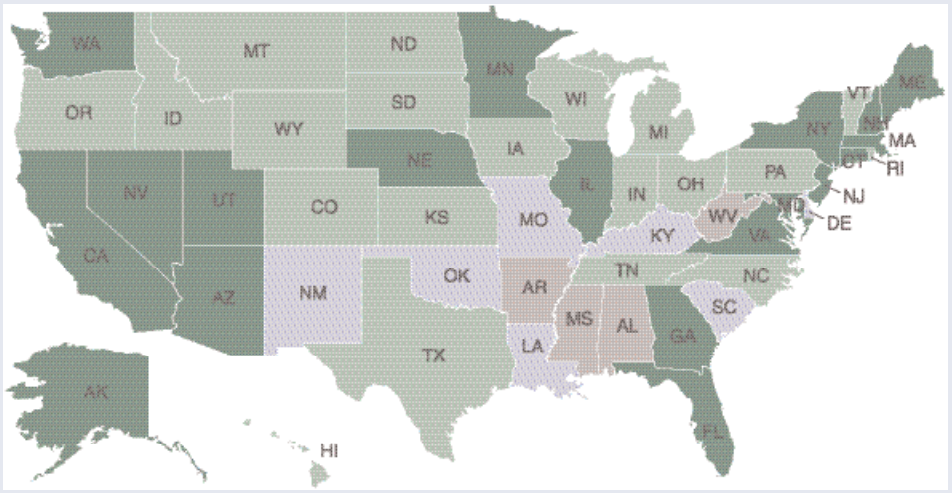
THE DIGITAL ECONOMY

In the old economy, virtually all economic transactions involved the transfer of physical goods and paper records, or the interaction of people in person or by phone. In the digital economy, a significant share of both business and government transactions are being conducted through digital electronic means. Indeed, e-commerce retail sales are growing six times faster than total retail sales.[86] By 2006, almost three-quarters of adults were online, and 52.2 million households, or 47 percent, had broadband access.[87]

As the use of IT has transformed virtually all sectors of the economy, the result has been a significant boost in productivity.[88] For example, the $500 billion trucking industry has saved $16 billion annually through the use of on-board computers that allow companies to track and dispatch trucks more efficiently.[89] Farmers use the Internet to buy seed and fertilizer, track market prices, and sell crops. Governments issue E-Z Passes to automate toll collection. Whether it is to pay bills or locate a package, consumers increasingly forgo a phone call to corporate customer service centers in favor of more efficient self-service over the Internet. All of this translates into productivity gains and increased standards of living. In this way, digital technology is doing as much to foster state economic growth in the early 21st century as mechanical and electrical technologies did in the early and mid-20th century.

The digital economy indicators measure six aspects of the digital economy: 1) the percentage of the population online; 2) Internet domain names; 3) deployment of IT in public schools; 4) the use of IT to deliver state government services; 5) the percentage of farmers online and using computers; and 6) the deployment of broadband telecommunications.

Aggregated Digital Economy Scores



Source: Authors' calculations based on the states' scores in six indicators – online population, domain name registrations, technology in schools, e-government, online agriculture, and broadband telecommunications.

ONLINE POPULATION

Internet users as a share of the population.

Why Is This Important? The number of people online is probably the most basic indicator of a state's progress toward a digital economy. While in 2000, 46 percent of adults were online, by 2006 this number had grown to 73 percent.[90] The average income and education levels of Internet users continue to drop so that the online population is looking more and more like the American population in general, with the exception of seniors, who are lagging significantly behind in Internet adoption.[91]

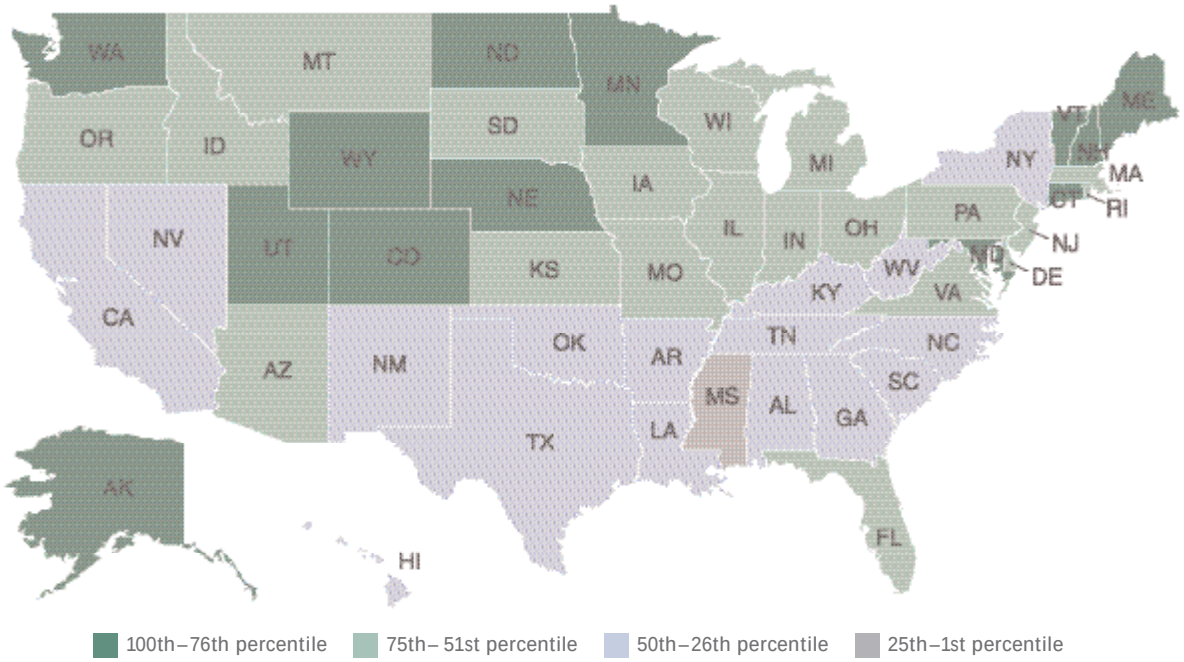
The Rankings: States differ significantly in the degree to which their residents are online. At the end of 2003, approximately 72 percent of Alaska's population had Internet access compared to 43 percent in Mississippi, which remained the only state with less than half its population online. States with more highly educated workforces tend to score well (including Connecticut, Colorado, Vermont and Washington), as do states with higher per capita incomes.[92] To some extent, state policies affect the level of Internet access, and these range from the taxes that some states impose on Internet access to policies that other states have implemented to promote rural Internet penetration.

	The Top Five	Percentage of population online
1	Alaska	72%
2	New Hampshire	70%
3	Utah	70%
4	Minnesota	69%
5	Wyoming	68%
	U.S. Average	59%

Source: National Telecommunications and Information Administration, 2003 data.

	The Top Five Movers	1999 Rank[93]	2002 Rank	2007 Rank	Change 02-07
1	Nebraska	30	28	11	↑17
2	Arizona	14	32	17	↑15
3	North Dakota	33	24	12	↑12
4	Connecticut	19	14	7	↑ 7
4	Illinois	43	38	31	↑ 7

"73 percent of adults were online in 2006, compared to 46 percent in 2000."



INTERNET DOMAIN NAMES

The number of Internet domain names (.com, .net, and .org) per firm.[94]

Why Is This Important? Use of the Internet by organizations continues to grow at a rapid pace. The number of ".com" domain names registered in the United States grew from 19 million in July 2001 to 30.5 million in September 2006.[95] For even small local businesses, a website has become the storefront of the 21st century. More importantly, an increasing number of firms, regardless of industry, have made a highly functional website integral to their business model, as doing so has become a competitive necessity.

The Rankings: It is not entirely clear what drives the number of domain name registrations in a state. The number of domain names per firm varies significantly across states. The highest-ranking state, Nevada, has almost 8 times more domains per firm than the lowest-ranking state, South Dakota. Nevada's particularly high score is likely attributable to the large number of gambling and adult sites located there, as firms in these industries may register a disproportionate number of domain names. A similar phenomenon may be at work in other online industries and states. However, as one would expect, states with a strong presence of high-tech companies tend to rank in the top 15. Also, as expected, there is a strong correlation between states with a high number of domain names per firm and states with more extensive broadband deployment (0.66).

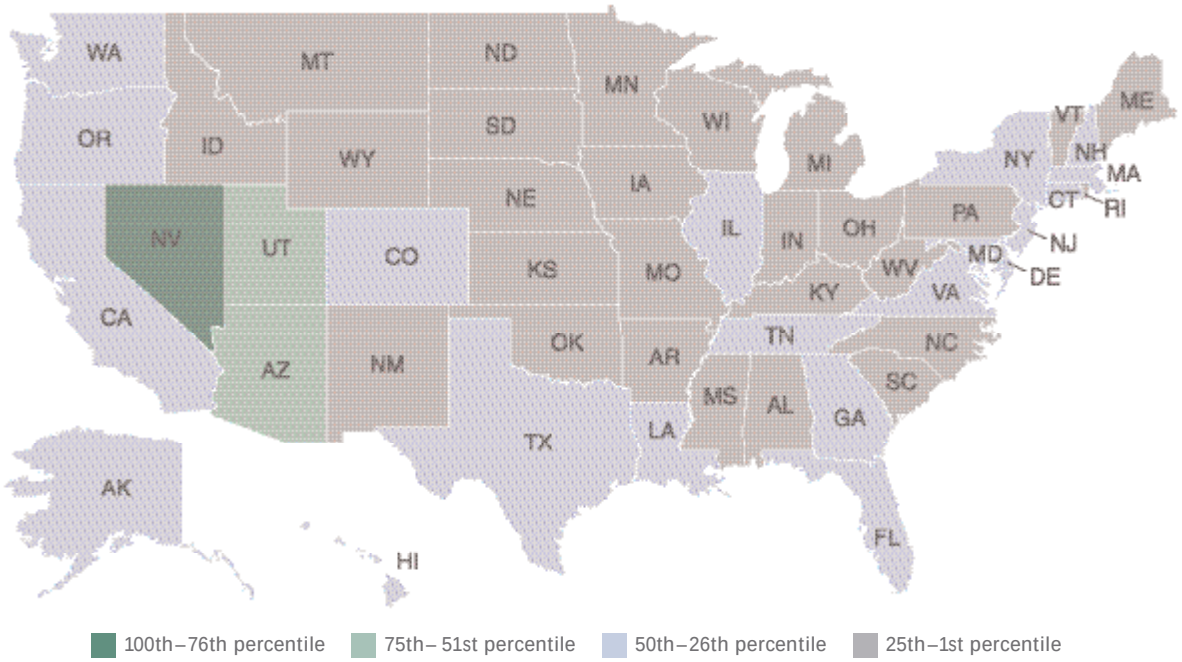
	The Top Five	Domain names per firm
1	Nevada	7.15
2	Arizona	5.04
3	Utah	4.04
4	California	4.01
5	Hawaii	3.88
	U.S. Average	2.94

Source: Matthew Zook, University of Kentucky, December 2004 data.

	The Top Five Movers	1999 Rank[96]	2002 Rank*	2007 Rank	Change 02-07
1	Louisiana	44	37	21	↑16
2	Texas	21	20	9	↑11
3	Alaska	24	26	17	↑ 9
3	Oklahoma	35	40	31	↑ 9
5	Utah	5	11	3	↑ 8

* 1999 and 2002 scores measure ".com" domains only

"The number of ".com" domain names registered in the United States grew from 19 million in July 2001 to 30.5 million in September 2006."



TECHNOLOGY IN SCHOOLS

A weighted measure of three factors measuring computer and Internet use in schools.[97]

Why Is This Important? There is increasing evidence that when employed correctly, computers and the Internet boost educational outcomes.[98] Not surprisingly, the use of information technology in America's schools is growing. Virtually every public school now has access to the Internet. In 2000, there were 7.9 students per Internet-connected computer, but by 2005 the number of students per *high-speed* Internet-connected computer had dropped to 3.9. Even so, levels of student computer access have shown little improvement since 2002, with the number of students per instructional computer remaining close to 4.[99]

The Rankings: States that have done the most to integrate IT into schools are the less populated and more geographically dispersed states, suggesting that a motivating factor is the desire to establish better connections to information and resources in other parts of the nation and the world. Political leaders in these and other states may recognize that the widespread use of IT is an important key to their future prosperity and that it is essential to properly train the next generation of workers. Surprisingly, a number of states with strong technology economies have generally scored near the bottom on this measure, including California, Maryland, and New Hampshire. However, there is evidence that this is starting to change: Connecticut has improved its rank by 18 since 2002 (29th in 2007), while both New York (36th) and Massachusetts (33rd) have improved by 7.

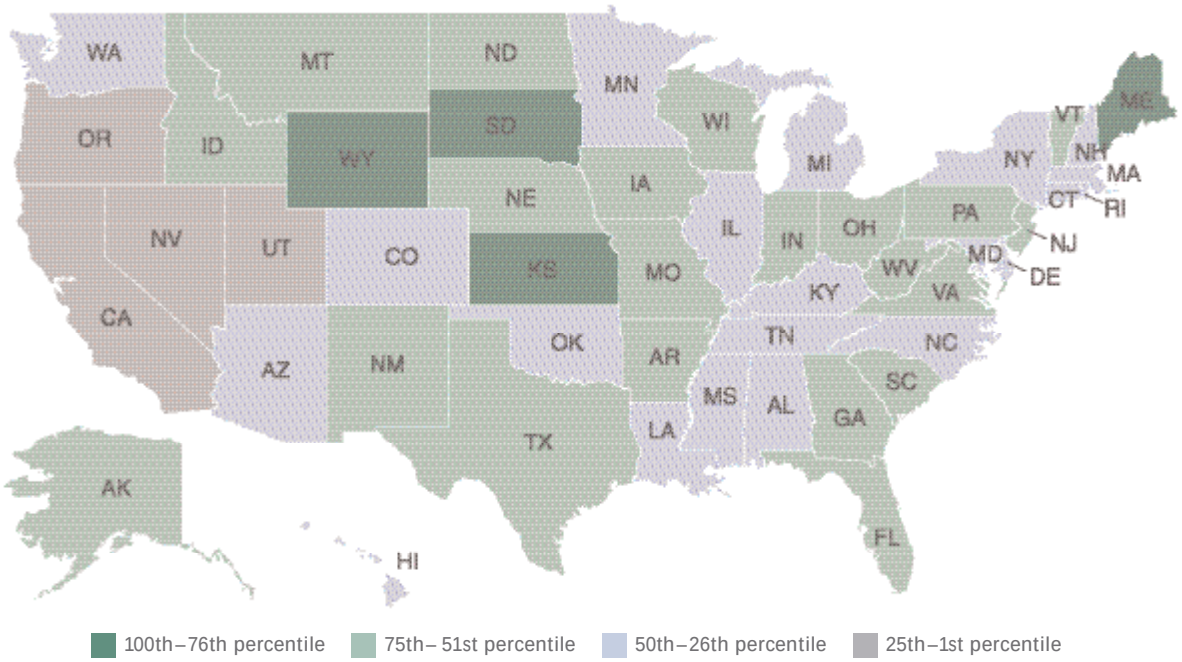
	The Top Five	Composite score
1	South Dakota	7.43
2	Maine	7.29
3	Wyoming	6.79
4	Kansas	6.35
5	West Virginia	6.09
	U.S. Average	5.00

Source: *Education Week*, 2005 data.

	The Top Five Movers	1999 Rank[100]	2002 Rank*	2007 Rank	Change 02-07
1	Montana	19	31	8	↑23
2	Florida	21	39	17	↑22
3	New Mexico	44	38	18	↑20
4	Connecticut	42	47	29	↑18
5	Pennsylvania	45	34	20	↑14

* Different *Education Week* measures were used in different years.

"In 2000, there were 7.9 students per Internet-connected computer, but by 2005 the number of students per *high-speed* Internet-connected computer had dropped to 3.9."



E-GOVERNMENT

A measure of the utilization of digital technologies in state governments.[101]

Why Is This Important? State governments that fully embrace the potential of networked information technologies will not only increase the quality and cut the costs of government services, but also help to foster broader use of information technologies among residents and businesses. State governments have made considerable progress in using the Internet to allow individuals to interact with government – from paying taxes to renewing drivers' licenses. But the next phase of e-government – breaking down bureaucratic barriers to create a functionally oriented, citizen-centered government Web presence designed to give citizens a self-service government – has only just begun.[102]

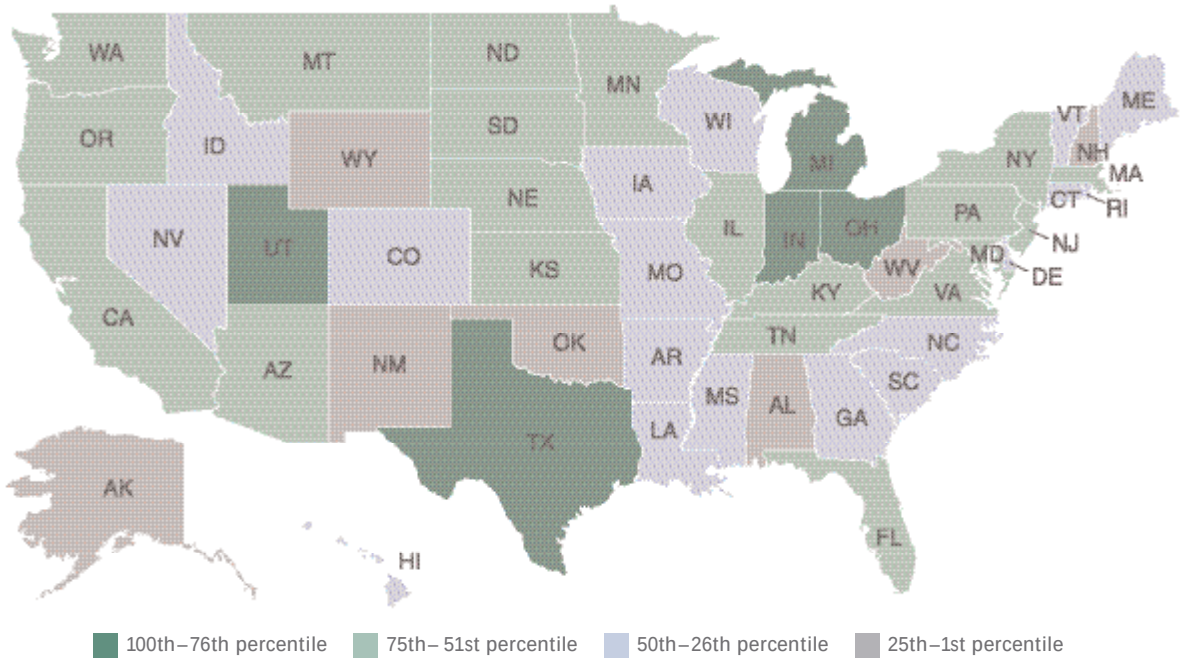
The Rankings: States with a tradition of "good government," such as Michigan and Utah, appear to have gone farther along the path toward digital government than states without it. But this relationship is not completely predictive. In part, this may be because the move to digital government appears to be driven by the efforts of particular individuals, including governors, secretaries of state, and legislative committee chairman. Strong gubernatorial leadership is surely at play in explaining some states' higher scores. In addition, because making the transformation to a digital government can be expensive, more populous states with bigger budgets also tend to score higher.

The Top Five		Composite score
1	Michigan	6.78
2	Utah	6.35
3	Indiana	6.35
4	Texas	6.15
5	Ohio	6.07
	U.S. Average	5.00

Source: The Center for Digital Government, 2006 data; and Darrell West, Brown University, 2006 data.

The Top Five Movers		1999 Rank[103]	2002 Rank	2007 Rank	Change 02-07
1	Tennessee	20	43	7	↑36
2	Kentucky	23	32	11	↑21
2	Arizona	13	38	17	↑21
4	Minnesota	8	26	9	↑17
5	Virginia	17	20	6	↑14

"The next phase of e-government – breaking down bureaucratic barriers to create a functionally oriented, citizen-centered government Web presence designed to give citizens a self-service government – has only just begun."



ONLINE AGRICULTURE

A measure of the percentage of farmers with Internet access and using computers for business.[104]

Why Is This Important? While agriculture accounts for less than five percent of employment, in many states it remains an important component of the economy. Just as in other sectors, the New Economy is transforming agriculture. Farmers and ranchers increasingly use the Internet to buy feed and seed, check on weather conditions, obtain the latest technical information, and even to sell their livestock or crops. In 2005, 51 percent of farms had access to the Internet, compared to 29 percent in 1999.[105] The degree to which farmers take advantage of the New Economy will increasingly determine their competitive success. Two measures of this are the percentage of farmers with Internet access, and the percentage who use computers to run their farms.

"In 2005, 51 percent of U.S. farms had access to the Internet, compared to 29 percent in 1999."

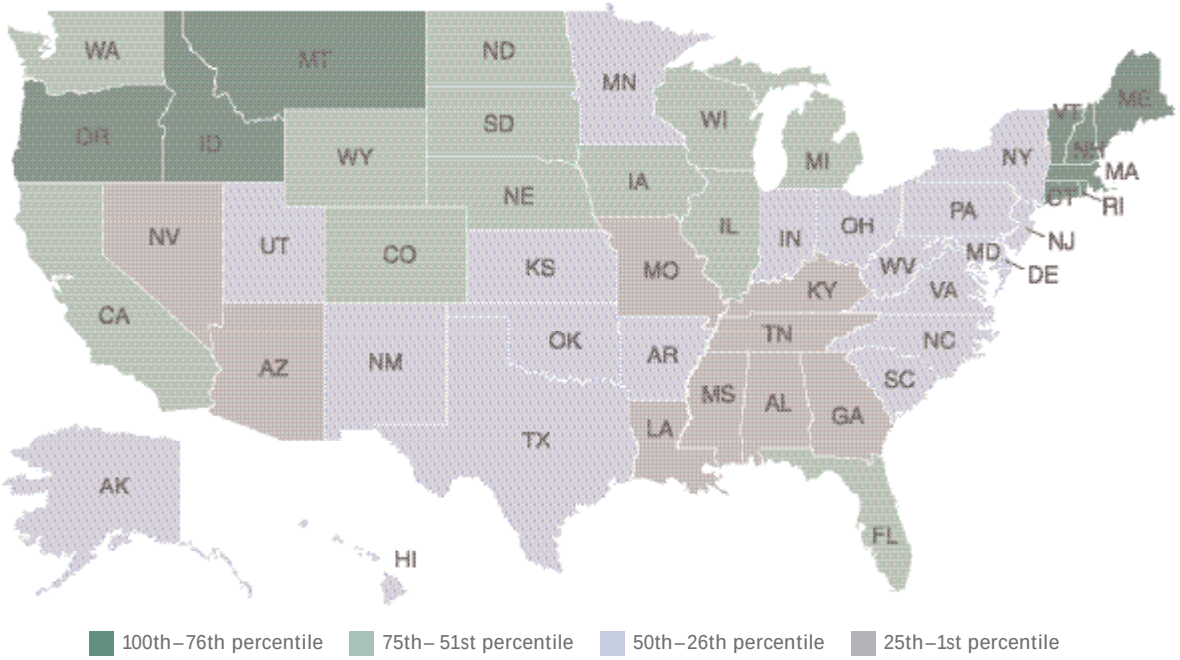
The Rankings: Farmers in Northeastern and Western states lead the nation in use of computers and access to the Internet. Southern states generally fall near the bottom.

	The Top Six[106]	Composite Scores
1	Connecticut	7.18
1	Maine	7.18
1	Massachusetts	7.18
1	New Hampshire	7.18
1	Rhode Island	7.18
1	Vermont	7.18
	U.S. Average	5.00

Source: U.S. Department of Agriculture, 2005 data.

	The Top Eight Movers	2002 Rank*	2007 Rank	Change 02-07
1	Florida	28	15	↑13
1	North Carolina	41	28	↑13
3	Connecticut	12	1	↑11
3	Maine	12	1	↑11
3	Massachusetts	12	1	↑11
3	New Hampshire	12	1	↑11
3	Rhode Island	12	1	↑11
3	Vermont	12	1	↑11

* 2002 state ranks have been revised for data comparability.



BROADBAND TELECOMMUNICATIONS

A weighted measure of the deployment of residential and business broadband lines.[107]

Why Is This Important? Over computer networks, bandwidth measures the "size of the pipes" between the sender and receiver of data. Greater bandwidth allows faster transmission of larger amounts of data, which is critical for the increasing number of businesses that use the Internet to communicate with customers, suppliers, and other parts of the company. Broadband access for households is also important, not only allowing a state's residents to more robustly engage in e-commerce, but also enabling telecommuting, distance education, telemedicine, and a host of other applications that can boost productivity and quality of life. It is no surprise, then, that broadband deployment is proceeding at a rapid pace. The number of business and residential broadband lines in use has increased dramatically in the last five years, reaching 50.2 million in December 2005, up from 28.2 million in December 2003 and 7 million in December 2000.[108] Between March 2005 and March 2006 alone, the percentage of American adults with a high-speed Internet connection at home increased from 30 to 42.[109]

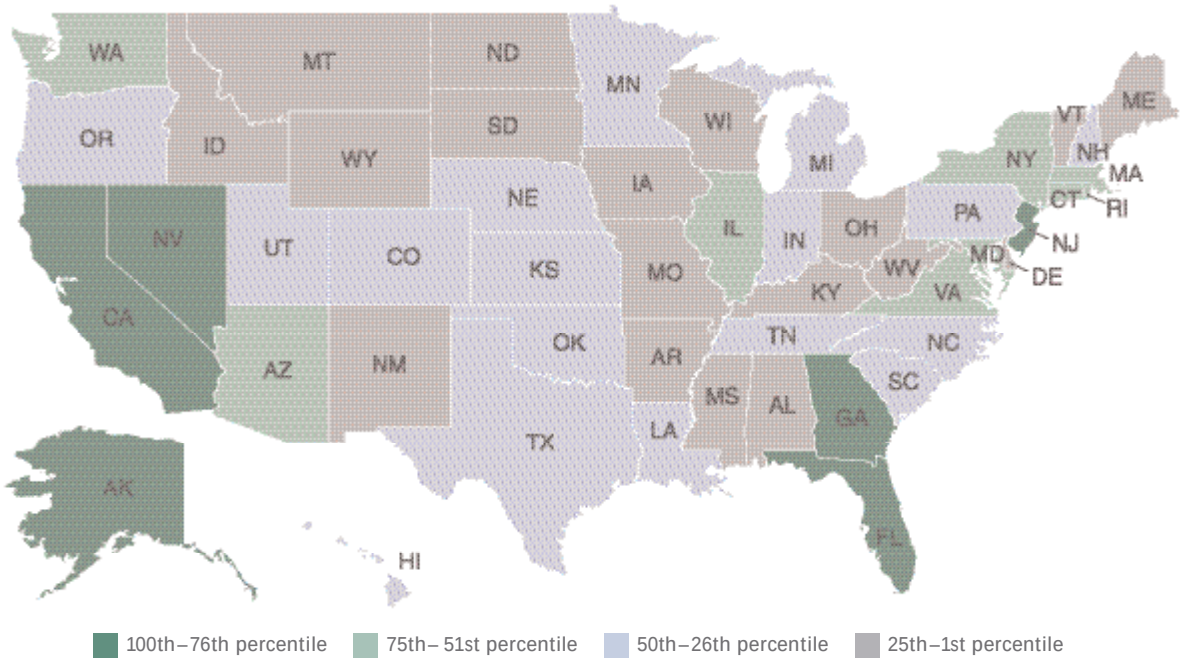
"Between March 2005 and March 2006 alone, the percentage of American adults with a high-speed Internet connection at home increased from 30 to 42."

The Rankings: Broadband deployment tends to be highest in high-tech states, including California, New Jersey, Massachusetts, New York, and Maryland, all of which rank in the top 10. Also, because it is cheaper to deploy broadband in metropolitan areas, states that are more densely populated tend to have more extensive broadband networks. Ranking 6th, Alaska may be an exception to this rule, but it has long led the nation in online population. For the most part, the lagging states (e.g., Mississippi, Montana, West Virginia, and Vermont) are those with more rural populations.

	The Top Five	Composite Score
1	Georgia	6.93
2	California	6.51
3	New Jersey	6.31
4	Florida	6.07
5	Nevada	6.03
	U.S. Average	5.00

	The Top Five Movers	2002 Rank*	2007 Rank	Change 02-07
1	Alaska	50	6	↑44
2	Oregon	32	16	↑16
3	Illinois	23	10	↑13
3	Rhode Island	28	15	↑13
5	Kansas	34	24	↑10

* 2002 state ranks have been revised for data comparability.[110]

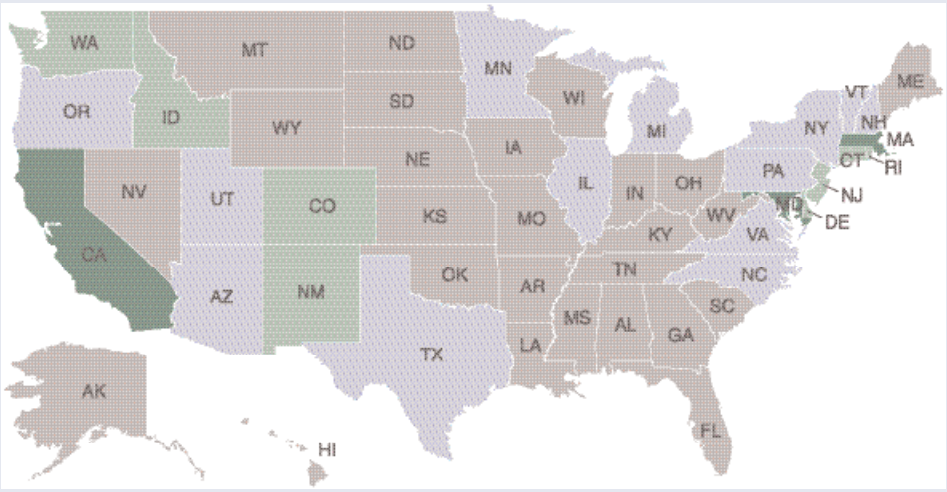


INNOVATION CAPACITY

Most growth in the New Economy, especially growth in per capita incomes, stems from increases in knowledge and innovation. Studies show that it is not the amount of capital, but the effectiveness with which it is used that accounts for as much as 90 percent of the variation in growth of income per worker.[111] Technological innovation is a fundamental driver of growth because it transforms the way capital is put to use. Therefore, it is not surprising that state scores on innovation indicators are correlated with per capita income growth between 1999 and 2005 (0.41). As a result, by embracing technological innovation, states can boost incomes.

The innovation capacity indicators in this section measure five aspects of innovation capacity: 1) share of jobs in high-tech industries; 2) scientists and engineers as a share of the workforce; 3) the number of patents relative to the size of the workforce; 4) industry R&D as a share of worker earnings; and 5) venture capital invested as a share of worker earnings.

Aggregated Innovation Scores



100th–76th percentile | 75th–51st percentile | 50th–26th percentile | 25th–1st percentile

Source: Authors' calculations based on the states' scores in five indicators—high-tech jobs, scientists and engineers, patents, industry investment in R&D, and venture capital.

Rank	State	Score
1	Massachusetts	17.28
2	California	15.48
3	Maryland	14.20
4	Delaware	14.09
5	New Jersey	13.31
6	Idaho	12.96
7	Colorado	12.88
8	Rhode Island	11.89
9	Washington	11.49
10	Connecticut	11.30
11	New Mexico	10.95
12	Virginia	10.66
13	Oregon	10.56
14	New Hampshire	10.39
15	Minnesota	10.30
16	Michigan	9.99
17	Vermont	9.89
18	Utah	9.81
19	Pennsylvania	9.40
20	New York	9.21
21	North Carolina	8.92
22	Texas	8.77
23	Arizona	8.61
24	Illinois	8.40
25	Ohio	7.35
26	Georgia	7.07
27	Kansas	7.02
28	Wisconsin	6.91
29	Indiana	6.74
30	Missouri	6.61
31	Florida	6.49
32	North Dakota	6.24
33	Montana	6.22
34	Iowa	6.06
35	Alabama	6.06
36	Nebraska	6.01
37	Mississippi	5.99
38	Maine	5.83
39	Nevada	5.81
40	Oklahoma	5.78
41	Tennessee	5.75
42	Hawaii	5.71
43	South Carolina	5.51
44	Wyoming	5.44
45	West Virginia	5.18
46	Alaska	5.08
47	Kentucky	5.01
48	South Dakota	4.82
49	Arkansas	4.62
50	Louisiana	4.55
	U.S. Average	10.00

HIGH-TECH JOBS

Jobs in electronics manufacturing, software and computer-related services, telecommunications, and biomedical industries as a share of total employment.[112]

Why Is This Important? The high-tech sector remains a key engine of innovation in the New Economy and a source of high-paying jobs. The 2000 meltdown, growth of IT offshoring, and faster productivity growth in the IT sector all caused a decline in high-tech employment, which finally began to rebound in 2004 and 2005. In the future, however, these factors may mean that the high-tech sector does not add a disproportionate number of jobs. Undiminished is the industry's importance as a source of technological innovation that boosts productivity growth in all sectors.[113] Moreover, it remains a stronghold of high-wage, skilled jobs: average high-tech industry wages reached $72,000 in 2005, compared to the U.S. average of $38,000.[114]

The Rankings: High-tech specialization of states varies significantly, from a high of 6.5 percent of the workforce in Massachusetts to 1.4 percent in Wyoming. While all states have high-tech jobs, the leaders tend to be in the Northeast, the Mountain states, and the Pacific region. High-tech occupations are often concentrated in particular regions of a state: information technology in southern New Hampshire, software around Provo, Utah and Seattle; Internet, telecommunications and biotechnology in the Washington, D.C. region; telecommunications in Denver; semiconductors in Albuquerque; and a broad mix of technologies in Silicon Valley and Los Angeles.

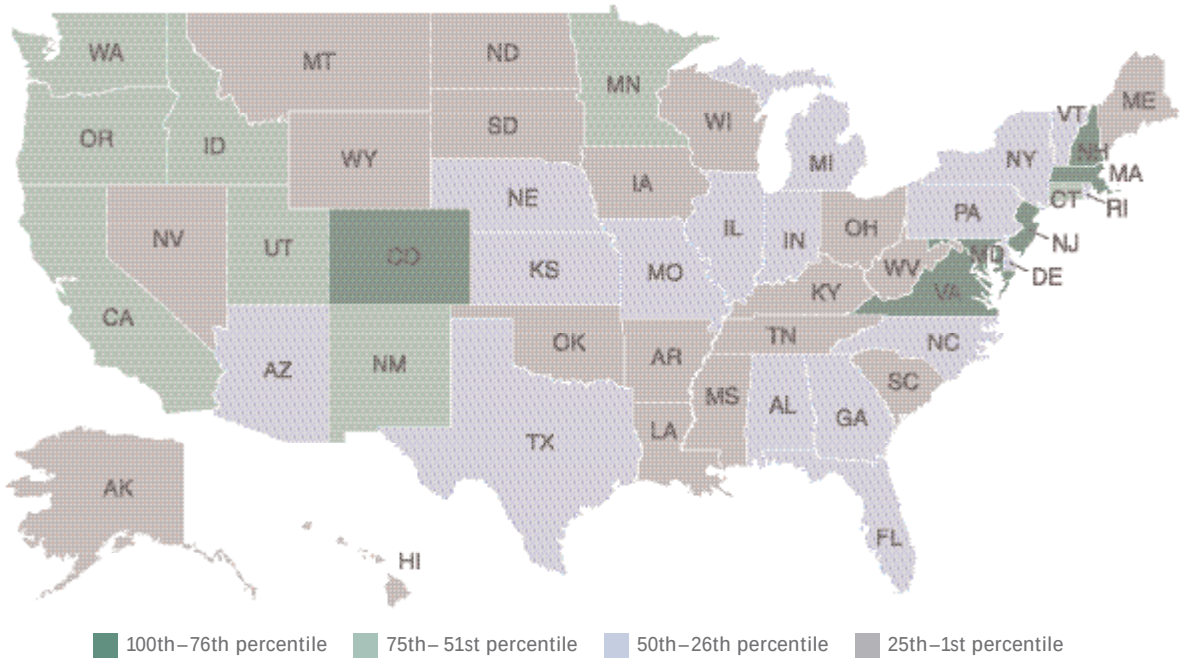
	The Top Five	High-tech jobs as a percentage of all jobs
1	Massachusetts	6.46%
2	Virginia	5.80%
3	Colorado	5.77%
4	New Jersey	5.34%
5	Maryland	5.34%
	U.S. Average	3.75%

Source: AeA, and Bureau of Labor Statistics (for biomedical sectors), 2004 data.

	The Top Five Movers	1999 Rank[115]	2002 Rank*	2007 Rank	Change 02-07
1	Delaware	37	32	15	↑17
2	Michigan	34	35	20	↑15
3	Alaska	44	46	36	↑10
4	New Mexico	22	15	8	↑ 7
4	Idaho	13	18	11	↑ 7

* 2002 state ranks have been revised for data comparability.[116]

"The average high-tech industry wage is $72,000, compared to the U.S. average of $38,000."



SCIENTISTS AND ENGINEERS

Scientists and engineers as a percentage of the workforce.[117]

Why Is This Important? In the New Economy, the key engines of growth–technology and research-based companies–are fueled by a large, high-caliber scientific and engineering workforce. The economy continues to become more technology-intensive, as the number of scientists and engineers grew by 4.4 percent between 2001 and 2003, compared to overall employment growth of only 0.3 percent over the same period.[118] In addition, in spite of the concern about "brain drain" of newly minted scientists and engineers to other states, the correlation between the number of employed Ph.D. scientists and engineers and Ph.D. degrees in science and engineering from universities in the state is remarkably high (0.97). So growing or attracting a high-quality scientific workforce is critical to continued economic growth. These workers enable more innovation in state economies (in both new products and production processes), and in so doing lead to higher value-added and higher-wage jobs.

The Rankings: States with the highest rankings tend to be high-tech states (such as Massachusetts, Virginia, and Colorado), states with significant corporate R&D laboratory facilities (such as Delaware, Connecticut, New Jersey, New York, and Vermont), or states with significant federal laboratory facilities (like Maryland, New Mexico, and Rhode Island). In addition, many of these states have robust science and engineering higher education programs. States that lag behind have few high-tech companies or labs, and relatively limited science and engineering higher education programs.

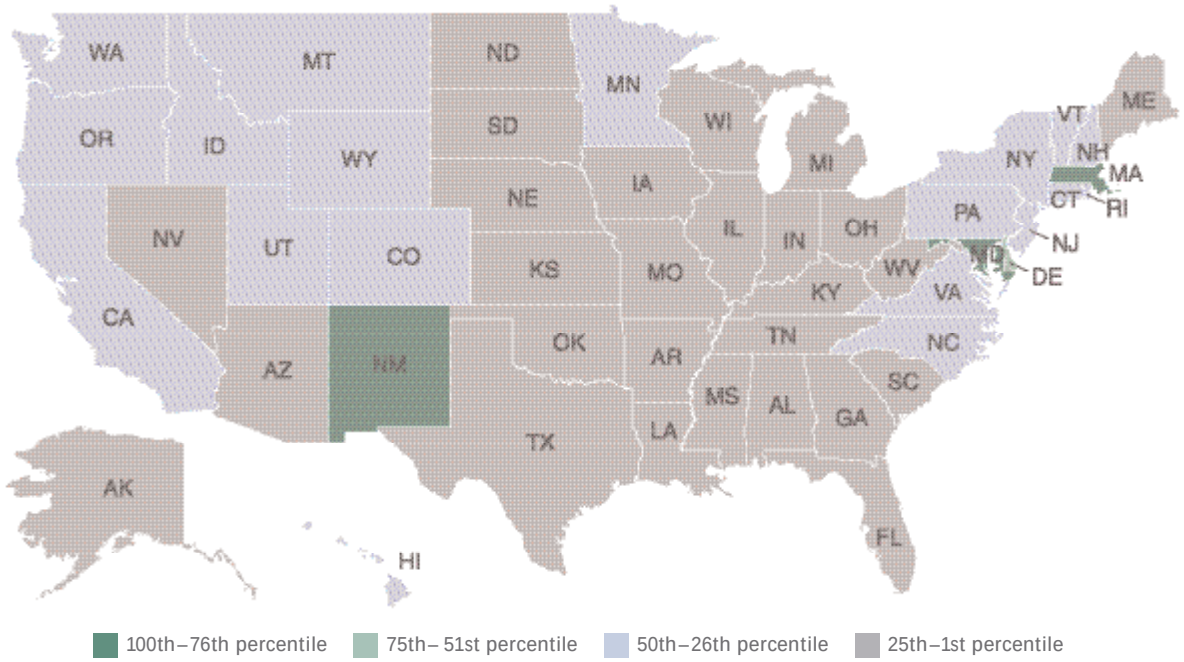
	The Top Five	Scientists and engineers as a percentage of the workforce
1	Maryland	0.98%
2	New Mexico	0.94%
3	Massachusetts	0.83%
4	Delaware	0.69%
5	Rhode Island	0.57%
	U.S. Average	0.41%

Source: National Science Foundation, 2003 data.

	The Top Five Movers	1999 Rank[119]	2002 Rank*	2007 Rank	Change 02-07
1	Wyoming	32	30	21	↑9
2	Tennessee	29	37	31	↑6
3	Virginia	13	13	8	↑5
3	Idaho	28	28	23	↑5
5	Georgia	40	40	36	↑4

* 2002 state ranks have been revised for data comparability.

"The economy continues to become more technology-intensive, as the number of scientists and engineers grew by 4.4 percent between 2001 and 2003, compared to overall employment growth of only 0.3 percent over the same period."



PATENTS

The number of patents issued to companies or individuals per 1,000 workers.[120]

Why Is This Important? The capacity of firms to develop new products will determine their competitive advantage and ability to pay higher wages. One indicator of the rate of new product innovation is the number of patents issued. And patents appear to have been a key driver of state income growth over the last half century.[121] As technological innovation has become more important, patents issued per year have grown from 40,000 in 1985 to 75,000 in 2005.

The Rankings: States with an above-average share of either high-tech corporate headquarters or R&D labs tend to score the highest. Idaho's extremely high patent ratio – more than 4 times the national average – is likely owed to the presence of Micron, a major semiconductor firm located in what is a relatively small state. Colorado has a strong telecommunications and technology industry base. Many Northeastern states, as well as West Coast high-tech states, like California and Washington, also score high.

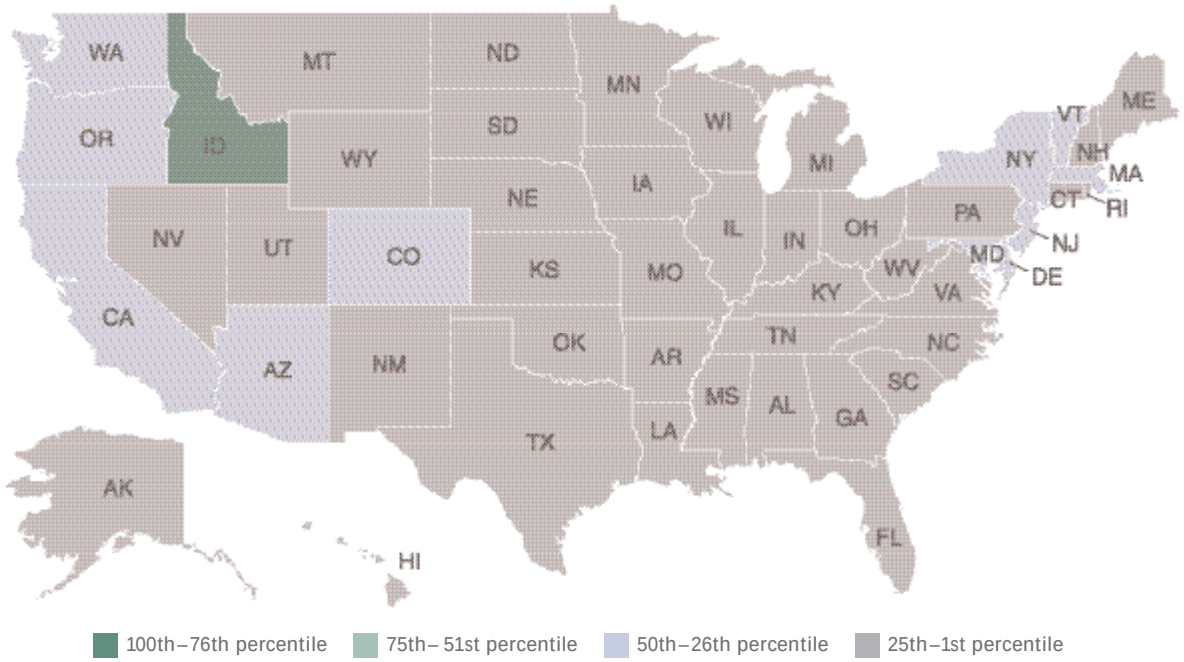
	The Top Five	Adjusted patents per 1,000 workers
1	Idaho	2.99
2	Colorado	1.33
3	Washington	1.32
4	California	1.29
5	Delaware	1.22
	U.S. Average	0.75

Source: U.S. Patent and Trademark Office, 2003, 2004 and 2005 data.

	The Top Six Movers	2002 Rank	2007 Rank	Change 02-07
1	Massachusetts	17	6	↑11
1	Maine	42	31	↑11
3	Washington	10	3	↑ 7
3	South Dakota	48	41	↑ 7
5	Michigan	21	15	↑ 6
5	Kansas	38	32	↑ 6

* 2002 state ranks have been revised for data comparability.[122]

"Patents issued have increased from 40,000 in 1985 to 75,000 in 2005."



INDUSTRY INVESTMENT IN R&D

Industry-performed research and development as a percentage of total worker earnings.[123]

Why Is This Important? Research and development, which yields product innovations and adds to the knowledge base of industry, is a key driver of economic growth. Business provides just under two-thirds of all R&D funding. After steadily rising in the 1980s and falling in the early 1990s, business-funded R&D as a share of GDP climbed to its highest point ever in 2000. A slight decline followed, but it has remained at a level higher than any year before 1999, with R&D as a share of GDP growing again in 2004.[124]

The Rankings: The two smallest states, Delaware and Rhode Island, rank 1st and 2nd, respectively, in R&D intensity. DuPont and other R&D-intensive chemical and pharmaceutical firms are responsible for Delaware's top rank, while Rhode Island may score well because of a number of defense electronics and biotechnology firms, and the fact that it instituted the nation's most generous R&D tax credit several years ago. New Jersey is home to a number of pharmaceutical and high-tech companies, and much of Michigan's R&D is automobile-related. In general, states with significant corporate R&D laboratory facilities, or a large number of high-tech firms score well. Mississippi's vastly improved rank – from 47th in 2002 to 14th in 2007 – may or may not be significant. Because industry R&D expenditures can vary greatly from year to year, this is difficult to assess without more recent data to show if the trend is sustained.

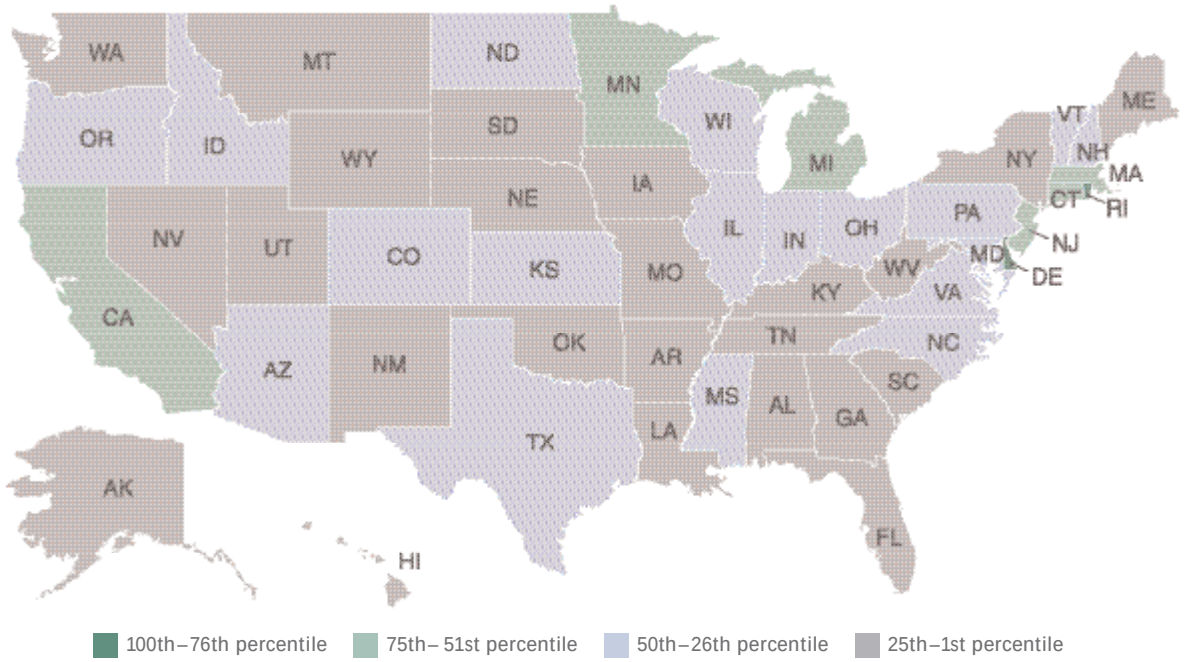
	The Top Five	Adjusted R&D as a percentage of worker earnings
1	Delaware	7.13%
2	Rhode Island	5.48%
3	New Jersey	5.16%
4	Michigan	4.76%
5	California	4.38%
	U.S. Average	3.17%

Source: National Science Foundation, 2003 data.

	The Top Five Movers	2002 Rank*	2007 Rank	Change 02-07
1	Mississippi	47	14	↑33
2	Maryland	26	9	↑17
3	North Dakota	38	22	↑16
4	Oregon	23	10	↑13
5	Indiana	34	24	↑10

*2002 state ranks have been revised for data comparability.[125]

"In 2004, R&D as a share of GDP was higher than any year before 1999."



VENTURE CAPITAL

Venture capital invested as a share of worker earnings.[126]

Why Is This Important? Venture capital is an important source of funding for new, fast growing entrepreneurial companies. In effect, venture capitalists identify promising innovations and help bring them to the marketplace. Venture-backed firms are also an important source of job growth, adding 600,000 jobs between 2000 and 2003 (an increase of 6.5 percent), while overall employment at private firms actually decreased by 2.3 percent.[127] At $20 billion, venture capital investments in 2005 represent a slight increase over the two previous years (in constant 2000 dollars). While significantly less than at the height of the Internet bubble ($104 billion disbursed in 2000), venture capital remains large by historical standards. In fact, as a share of GDP, venture capital in 2005 (0.18 percent) was larger than any year before 1998.[128]

The Rankings: While venture capital is less concentrated than it was a decade ago, the majority of investments continue to take place in a handful of traditionally strong states. In fact, since the height of the boom in 2000, venture capital has become more geographically concentrated. In 2005, 79 percent of investments went to the top 10 states, up from 69 percent in 2000. The states at the top generally have strong university engineering and science programs and an existing base of high-tech companies, both of which can be the source of entrepreneurial start-ups or spinoffs. There is also considerable continuity over the last few years: only one state in the top five (Utah) did not rank in the top five in the 1999 and 2002 versions of the *Index*.

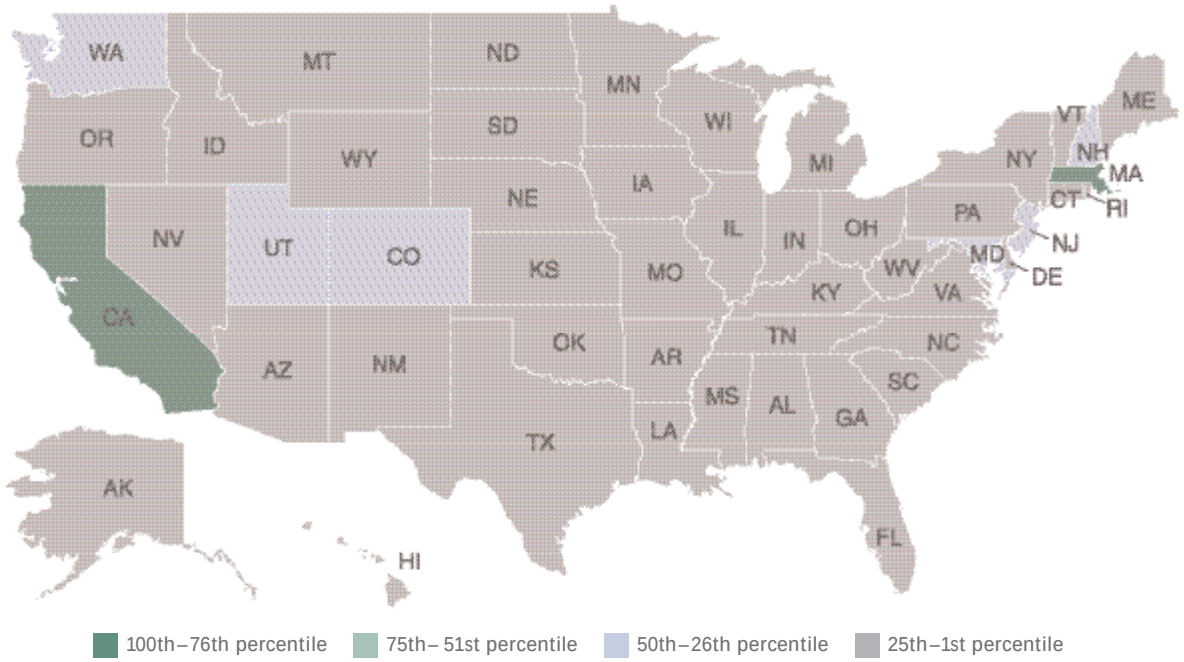
"In 2005, venture capital as a share of GDP (0.18 percent) was larger than any year before 1998."

	The Top Five	Venture capital as a percentage of worker earnings
1	Massachusetts	1.36%
2	California	1.27%
3	Washington	0.61%
4	Colorado	0.50%
5	Utah	0.47%
	U.S. Average	0.35%

Source: PricewaterhouseCoopers/Venture Economics/NVCA, 2005-2006 data.

	The Top Six Movers	1999 Rank[129]	2002 Rank*	2007 Rank	Change 02-07
1	New Mexico	44	43	16	↑27
2	Wyoming	44	49	27	↑22
3	Nevada	28	40	21	↑19
4	Vermont	39	29	15	↑14
5	Rhode Island	43	22	12	↑10
5	West Virginia	44	47	37	↑10

* 2002 state ranks have been revised for data comparability.[130]



ECONOMIC DEVELOPMENT STRATEGIES FOR THE NEW ECONOMY

States face a new imperative to boost the competitiveness of their economies not just relative to each other, but to other nations. To succeed in the New Economy, states will need to overhaul their familiar approaches to economic development. They can start by looking anew at how wealth is created in the New Economy.

The formula for success in the old economy was to grow and attract capital investment in factories and other infrastructure. Nations that accumulated capital thrived. States that attracted capital thrived. In the neoclassical economics paradigm that guided economic policy, most firms were seen as having stable production functions and were seeking to produce at the lowest possible cost by reducing the price of factor inputs (e.g., land, materials, labor, and taxes). Accordingly, firms, markets and entire economies were thought to exist in a rough equilibrium, albeit one occasionally upset by marginal changes in input prices. If, for example, labor costs increased in a region because of stronger demand, labor-intensive production processes would move to regions with lower labor costs until equilibrium was regained. Because firm decisions were seen as highly responsive to marginal changes in prices the role for state policy was to keep costs low, including by subsidizing business costs.

The formula for success in the New Economy is quite different. Now, firms must innovate, by developing new products, services, and business models, and by continuing to transform existing business processes and make them more productive. Nations and states that accomplish this task will thrive. As such, the old neoclassical economics paradigm is a poor guide to action in this New Economy. Fortunately, a "new growth economics" has emerged in the last decade.[131] This new growth economics was driven by the recognition that the old economic models created in an industrial era dominated by commodity goods production could no longer adequately explain growth, especially in an economy powered by knowledge and innovation.[132] In this world, it is not equilibrium that characterizes economies, or cost reduction that drives them. It is disequilibrium – what noted economist Joseph Schumpeter termed "creative destruction" – that characterizes economies and innovation and knowledge that drive them.[133]

Consider the dramatic economic changes of the last 15 years. They occurred not because the nation obtained more capital to invest in even bigger steel mills or car factories, but because the nation developed a wide array of new technologies (e.g., cell phones, the Internet and World Wide Web, fast computer chips, genetic engineering, fiber optics, robotics) and because many organizations (for profit, non-profit, and government) adopted these technologies and restructured work, created new products and services, and reached out to new markets. While capital was needed, it was neither the driver nor was it in short supply. Rather, innovation and new technologies were the drivers and more of both would have been even better.

As such, at both the national and state levels there is increasing evidence that growth is driven by innovation, not by capital accumulation.[134] The implication for state economic development is both straightforward and profound. Lower costs and capital attraction can no longer be the principal sources of a state's long-term growth. Instead, states need to ensure that their economic environment is conducive to supporting technological change, entrepreneurial drive, and higher skills. This new model of economic development is grounded in the view that it is only through actions taken by workers, companies, industry consortia, entrepreneurs, research institutions, civic organizations, and governments that an economy's productive and innovative power is enhanced. To prosper in the New Economy, states need to be focused on questions such as: are entrepreneurs taking risks to start new ventures? Are workers continually upgrading their skills? Are companies investing in those skill upgrades and organizing production in ways that utilize those skills? Are companies investing in technological breakthroughs and is government supporting the technology base (e.g., funding research and training scientists and engineers)? Are regional clusters of firms and other institutions fostering innovation? Are policymakers avoiding erecting protections for companies against more innovative competitors? Are research institutions transferring knowledge to companies? Are policies supporting the widespread adoption of advanced information technologies and e-commerce? And are state and local economic development efforts organized in ways that fit these new realities?

In short, the new economic development model recognizes the fundamental insight that innovation and entrepreneurship are

key, and that both take place in the context of institutions. This means that the new economic development focuses much more extensively on promoting technological innovation, supporting dynamic acquisition of workforce skills, spurring entrepreneurship, supporting industry cluster and knowledge networks, and also lowering business costs, but in ways that at the same time boost quality of life.

The New Economy and the new growth theory have implications not only for the practice of economic development, but for its very purpose. In the old economy the goal was clear: to "get big," by adding more jobs – whenever, wherever, whatever. It did not matter if the unemployment rate was low, if some parts of the state were booming (with high housing prices and transportation congestion), or if the companies getting incentives provided low-paying, poor quality jobs and were likely to leave for even greener pastures soon after. More jobs was the goal. This goal was not necessarily inappropriate. In the old economy, in fact, getting big was a viable strategy for getting prosperous. From the early 1960s to the early 1980s, there was a modest correlation (around 0.2) between growth in population in metropolitan areas and growth in income.[135] But after the early 1980s, that relationship broke down and now there is virtually no relationship. In fact, in the last decade, some metropolitan regions have not grown in population but have grown in income, while others have grown in population but not very much in income.

In the New Economy, therefore, most states should not focus on job growth alone. Instead, they should focus on boosting productivity, creating better jobs, and raising standards of living for all residents. To do this, states should replace, or at least supplement, the sole metric of success used today – job creation – with a new one: income growth. Governors should be able to point out proudly that per capita incomes grew significantly on their watch.

So what drives increases in per capita incomes? The old economy tactics will fail. Simply trying to attract more enterprises that produce mature, cost-based products and services seldom raises standards of living (unless a region is suffering from high unemployment). These industries often pay lower wages and provide fewer upward opportunities.

Several factors, however, do appear to drive higher incomes. One is a higher share of employment in knowledge-based industries.[136] While states with high concentrations of low and mid-tech manufacturing have below-average per capita incomes, states with higher concentrations of knowledge-based industries, including professional services and high-tech manufacturing, have higher incomes. Weissbourd finds that the percentage of a metropolitan area's earnings in the information sector (e.g., business services, IT) had a positive and significant effect on wage growth.[137] Likewise, using the data in this report, one finds a relatively strong correlation between absolute growth in per capita income between 1999 and 2005, and the share of workers employed in IT occupations (0.41) and high-tech jobs (0.36). In addition, inputs to the innovation process appear to drive income growth. Porter found that differences in patenting intensity accounts for 30 percent of the variation across regions in the average wage.[138] Likewise, Goldstein finds that business patenting and R&D expenditures support greater gains in regional per-worker earnings.[139] One reason why technology industries drive income growth is that average wages in high-tech clusters are $63,970 versus $43,180 in non-high-tech traded clusters.[140]

While knowledge-based firms are important, so are knowledge workers. There is a strong correlation between the share of knowledge workers, particularly workers with a college degree, and per capita income.[141] Weissbourd found that for each 2 percent growth in the proportion of college graduates in a metro area, income growth increased by about 1 percent.[142] Gottlieb found that between 1980 and 1997, the metro areas with the most educated populations enjoyed per capita income increases two times greater than metro areas with the least educated populations.[143] Higher levels of college education also appear to be related to levels of entrepreneurship, new firm formation, and fast growing firms. One study of metropolitan areas found that the most entrepreneurial regions possess the highest proportion of the population with a college degree.[144] And these talented workers are more mobile among metropolitan areas: places with a high proportion of talented workers that can attract more are better poised for economic growth than those that cannot.[145]

ALIGN INCENTIVES BEHIND INNOVATION ECONOMY FUNDAMENTALS

The realities of the new global economy suggest that a key to prosperity is to focus on growing innovation-based companies from within and supporting the building blocks of knowledge, innovation, and entrepreneurship. The reality is, however, that, absent federal intervention, states will continue to spend valuable tax dollars on incentives to attract business.

If incentives are to remain a key part of the tool kit, they should at least be aligned with the requirements of New Economy strategies. To accomplish this goal, states should consider the following:

Make incentives contingent on higher wages. If states give public money to private companies, they should at least expect their investment to lead to a higher standard of living. But it's not uncommon for states to provide incentives to firms paying wages below the median wage. Unless the jobs are created in a region with high unemployment, such incentives will not raise living standards. As a result, states should tie incentives to a wage floor so that if a predetermined share of a company's jobs pay below a certain wage, they are ineligible for incentives. Several states have done this. Kansas allows businesses that pay wages above average for the industry to take its corporate High Performance income tax credit.[146] Rhode Island tied eligibility for its investment tax credit to company wage levels. Minnesota will not provide incentives to businesses that pay below a certain level. Opponents of such provisions complain that this will lead companies to avoid these states. But incentives don't always swing the decision, and even if they do, do states really want to spend money that doesn't lead to higher living standards?

Use incentives to support the state's economic strategy. Incentives are a means, not an end. But most states do not use incentives strategically to support their economic strategy. Rather, the tactic is all too often "shoot anything that flies, claim anything that falls." To the extent that states continue to use incentives, they should be targeted to achieving certain goals, such as encouraging development in distressed parts of the state or boosting key industrial clusters. For example, throughout the 1980s, Massachusetts steered recruitment of biotech corporations to help support Worcester's successful efforts to build a biotech cluster. In the 1980s and 1990s, Delaware targeted financial services firms to build up its successful cluster. More recently, Albany, New York focused on expanding its semiconductor cluster, by recruiting semiconductor-related firms to the area. In some cases, it may be appropriate to target incentives not at particular sectors, but at places. States with lagging rural areas or regions with higher levels of unemployment can use incentives to encourage firms to locate in these places.

Stress innovation incentives instead of job creation incentives. Forty-five states have job creation incentives.[147] While their goal may be worthy, especially during periods of higher unemployment, the means are not effective. Unless job creation tax credits are very large, they seldom induce companies to hire. Companies hire more workers if they believe that the demand for their products or services is going to increase, not if the government offsets the cost of a new employee by a small percentage. Indeed, when the state of North Carolina evaluated their job creation tax credits, created by the William S. Lee Act, they found that only about 4 percent of jobs claimed under the Act were actually induced by the tax credits.[148] There is a second reason job creation tax credits are ineffective. Job creation tax credits try to lower the cost of labor relative to capital, hopefully spurring the substitution of labor for capital. But this is exactly the wrong goal. While developing nations use the strategy of cheap labor as a way to grow, states should instead ensure that their workers have better capital (equipment and skills) so their productivity is high enough to offset developing nations' lower costs.

As a result, if states are to succeed in the new global economy, they should reduce or even eliminate tax incentives for job creation, and instead use the revenues to expand incentives to spur firms to invest more in new equipment, skills, and R&D. This same logic applies to overall cuts in corporate tax rates. While many states seek to become more attractive to business by cutting corporate tax rates, if they are going down that path, they would be better served by cutting taxes in a way that also spurs greater investment in research, skills, or new capital equipment. These kinds of incentives are more effective than job creation incentives or general tax rate reductions in part because firm decisions about whether to invest in new capital equipment, worker training, and research and development – all actions that would increase their productivity or innovative capability – are much more sensitive to marginal differences in costs. For example, studies show that federal R&D tax credits produce at least one dollar of R&D for every dollar of forgone tax revenue and state R&D incentives generate even larger impacts.[149] If states feel they need to keep job creation incentives for political reasons, the incentives should at least be limited to counties experiencing high levels of unemployment (as defined by a particular formula).

Use targeted investments in knowledge infrastructure as an incentive. In many cases, the most important incentives at states' disposal are not tax breaks or other firm-specific incentives, but public investments that not only support a state's knowledge infrastructure but also provide key inputs for targeted firms and/or industries. Perhaps the best example of this approach was Texas' $300 million investment in the engineering program at the University of Texas used to help induce Texas Instruments to build their next generation chip fabrication facility in Texas. Not only did the state benefit by

capturing a $3 billion high-tech investment, but TI benefited by gaining access to a world-class electrical engineering department. Moreover, this infrastructural investment benefited other high-tech firms in the region as well. This is because knowledge is what economists call "non-rival," meaning more than one party can use it at once. In this case, the investment helps many firms in the region be more successful, generating a much bigger return to the state than if they simply gave Texas Instruments $300 million and hoped good things would happen.[150]

CO-INVEST IN AN INFRASTRUCTURE FOR INNOVATION

In an economy increasingly powered by technology and innovation, the ability of states to create an environment in which innovation thrives is critical to economic growth. Building a regional infrastructure for innovation requires that states do three key things: enhance the role of colleges and universities in regional innovation and growth; spur broadband deployment; and help companies be more innovative.[151]

Enhance the Role of Colleges and Universities in Regional Innovation and Growth

A key part of a state's innovation infrastructure is its colleges and universities. In an economy where organizations rely more on college-educated workers, universities and colleges have become increasingly important. In an economy more dependent on innovation, universities and colleges are playing a more active role in spurring innovation and commercialization. Between 1991 and 2004, the number of patent applications filed by United States universities increased from 13.7 applications per institution to 57.8, licensing income increased from $1.96 million per university to $7.06 million, and new university-based start-ups increased from 212 in 1994, to 462 in 2004.[152]

As a result, a number of states are now investing in helping to build their university-based technology infrastructure. Arizona invested $440 million for additional research facilities at its three public research universities. Indiana made a $300 million higher education investment. Through a ballot initiative, California has allocated $3 billion over 10 years for embryonic stem cell research. New Jersey and Illinois have followed suit, allocating significant funding to stem cell research projects.

Yet, while increased investments in universities are a step in the right direction, simply giving universities and colleges more money and hoping for the best is not enough. Left to their own devices, universities are just as likely to specialize in early stage basic research with few commercial benefits or in areas with little alignment with the state's key industrial clusters. In neither case is strong in-state commercialization likely. Even an overlap between universities' research (and education programs) and the state's key sectors is no guarantee of results. Without strong leadership or strong state incentives, or both, most universities will do what comes naturally: focus on research and teaching of interest to faculty. Some states are lucky to have one or more universities with leaders who view the university as a key partner with industry and government in creating and growing the knowledge economy. For example, the Texas A&M university system recently voted to allow commercialization of faculty research to be considered in the granting of tenure to faculty.[153] But most universities are more traditional. As a result, states should take several steps.

Target state higher education investments to priority industry clusters. An MIT study on the role of universities in regional economic development found, not surprisingly, that universities are most successful when they are attuned to the economic structure of their local economies.[154] As a result, maximizing the economic development impact of state investments in higher education requires that states develop a higher education strategy that is tied closely to the state's overall economic development strategy. As a result, states should target research support on the sweet spot of the overlap between the university/lab/hospital sector research strengths and the innovation capabilities and needs of in-state firms. A case in point is the alignment between University of California at San Diego and the wireless industry. San Diego is home to a world-class wireless telecommunications industry, anchored by Qualcomm. To support that cluster, the state and region systematically built up the university's electrical engineering department with a particular expertise in wireless technology. Similarly, the Ottawa Centre for Research and Innovation has worked effectively with university research leaders, top technology companies, and government officials to align that region's research infrastructure and ensure that the universities and federal labs are working to help industry.[155] Likewise, Oregon's NanoScience and Microtechnologies Institute serves as a forum for R&D synergy among Oregon's three public research universities, the Pacific Northwest National Laboratory, the state, and the "Silicon Forest" high-technology industry cluster.

Develop a "star" scientists and engineers program. Not all academic scientists and engineers have the same impact, either on the output of science or on the formation of new technology startups.[156] In fact, more than 90 percent of the

most significant university R&D is performed by just 10 percent of the faculty.[157] The number of "stars" in a region has a large effect on the probability of new firm start-up in that research area.[158] Such a strategy can be self-reinforcing, given the fact that stars tend to move to where there are other stars – for example from lower-ranked to higher-ranked universities. For such a program to be effective, however, it is important to recognize that not all stars are equal. Effective stars are entrepreneurial and willing to collaborate with colleagues and industry. Moreover, just like incentive programs, programs focused on attracting stars should work to enhance existing research strengths, rather than trying to build completely new ones from scratch.

Several states have established programs to attract star scientists. Georgia Research Alliance's Eminent Scholars program has provided more than $400 million in funding for its program since its inception in 1992. Kentucky's Research Challenge Trust Fund focused on purchasing advanced research equipment and recruiting eminent scholars in related fields. Ottawa's Centre for Research and Innovation's Industrial Research Chair program works to achieve the critical mass required for a major research endeavor in science and engineering of interest to regional industry. The program funds the salary of a distinguished research chair who is appointed for five-year periods (renewable for another five years if progress is satisfactory and industrial support continues).

Focus on commercialization of research. It's not enough to support research and scholars relevant to a state's industrial base, as universities also need to have strong linkages with companies and entrepreneurs so they can turn more of their knowledge assets into products and services. Commercialization succeeds when industry R&D staff is able to establish personal contacts with university researchers and where the university has an active and liberal policy to get their technologies into the marketplace and allow faculty to become entrepreneurs. There are a number of best-practice examples. The Georgia Advanced Technology Development Center at Georgia Tech is a technology incubator that offers services including consulting, connections to university researchers, and networking with other entrepreneurs and service providers. Similarly, another technology incubator, the Iowa State Innovation System (ISIS), identifies technology-based concepts and businesses at early stages of development and provides an environment for their growth. To date, ISIS has supported more than 80 start-up companies with its various partnerships, programs, and services. Utah's Research Centers of Excellence program helps spin off technologies from universities by supporting a professional business consultant that helps principal investigators develop commercialization strategies. MIT's Deshpande Center provides $50,000 "ignition" grants to potential faculty (or student) entrepreneurs, as well as mentors to help them prepare business plans, present to venture capitalists, etc. San Diego's CONNECT is a non-profit organization focusing on connecting industry to the university and on commercializing faculty inventions to locally-based start-up companies.[159] What makes CONNECT unique is that it is separate from the university's tech transfer office. The organization views its objective as promoting networking and information flow among university researchers, private firms, venture capital firms, and others.

Tie a portion of state funding of higher education to their economic development performance. Historically states have instituted a whole range of programs (e.g., research centers of excellence, industry-university grant programs) to spur universities and colleges to be more engaged in economic development. While these programs are often worthwhile, they don't go to the heart of the problem: higher education and states have different missions and goals. Faculty are rewarded more for publishing than for working with industry or commercializing discoveries.[160] To the extent that universities are concerned about knowledge transfer, they are largely focused on maximizing revenues, not enhancing in-state economic growth.

If states are to better align the mission of higher education with state economic development goals, they need to consider more systemic approaches. One is to tie a portion of states' higher education funding to the success of individual institutions at meeting the state's economic development goals. These goals might include doing research related to key industry clusters, providing technical assistance to companies in the state, and transferring technology to companies in the state. Universities and colleges that did well in meeting these goals relative to others would receive a larger share of state funding.

The key to success for such a system would be to develop the right performance metrics. These metrics might include patents received, licensing income, technical assistance provided to industry, and others. One important metric is a university's success in obtaining industry funding. A company's willingness to fund research or license technologies is perhaps the clearest measure of industrial relevance. States might provide public state universities and colleges with one dollar of state funding for every dollar from out-of-state firms and two dollars for every dollar from in-state firms.

One limitation of this metric is that smaller and younger firms are likely to have a harder time generating the funds to support academic research or license intellectual property. States could address this issue in one of two ways. They could establish matching grant programs for small firms along the lines of Maryland's Industrial Partnerships Program, Connecticut's Yankee Ingenuity Program, and Pennsylvania's Ben Franklin Partnership Programs. For example, MIPS provides funding, matched by participating companies, for university-based research projects that help companies develop new products or solve technical challenges.

A related program is Kentucky's research and development voucher program. The program, which has been copied by Georgia, North Carolina, and Puerto Rico, provides a repayable voucher to Kentucky firms that invest in universities in Kentucky to commercialize technology. Firms must invest, in cash and in-kind, one dollar for every dollar of state funds. Alternatively, states could create a more generous R&D tax credit for expenditures by firms at universities with small firms eligible for a more generous credit (e.g., 50 percent on all university investments).

The advantage of a performance-based approach is that it would be up to universities and colleges to figure out the best way to be more relevant to the state's economy. Universities might establish external advisory councils made up of industry leaders to provide insight into research trends and entrepreneurial activities. They might make it easier for faculty to work with industry or start new companies. They might streamline intellectual property procedures to make it easier to commercialize innovations. But the bottom line is that universities and colleges would have a much stronger motivation to be more effective economic development partners.

Facilitate Broadband Deployment

The IT revolution has been responsible for the lion's share of growth in the last decade.[161] And a key enabler of the digital economy will be ubiquitous high-speed broadband telecommunications. While broadband can't create competitive advantage for a region, lack of broadband can retard it. For example, between 1998 and 2002, employment in communities without broadband grew 1 percentage point slower annually than communities with it.[162] New high-speed services will better enable a whole host of services, including telemedicine, telecommuting and e-learning. States can help spur that rollout in several ways.

Enact statewide video franchise laws. A number of telecommunications carriers are rolling out higher-speed fiber optic video services, which also include high-speed broadband data services. Currently, they are required to go through a time-consuming process of obtaining cable TV franchise agreements in every community in a state. In order to better facilitate that process, states should enact statewide franchise laws. A number of states, including California, Indiana, Kansas, Michigan New Jersey, North Carolina, South Carolina, Texas, and Virginia, have already passed franchise reform legislation. Moreover, because broadband adoption is sensitive to prices and marginally lower prices would spur more deployment, states should also avoid taxing broadband services or making them pay into universal service funds, at least until a much larger share of the population is subscribing.[163]

Facilitate broadband demand aggregation. One reason why telecom providers have been slow to build out broadband to more rural communities is that the costs are higher and the revenues lower. However, when aggregated from government, education, health care, and large business users, broadband demand in many rural areas can make investments pay off. As a result, a number of regions have developed initiatives to form broadband buying coops that invite telecom providers to bid for their business and extend affordable broadband to their area. For example, New Hampshire formed public-private partnerships to create the Monadnock and North Country "Connects," giving businesses in rural parts of the state access to high-speed telecommunications at affordable prices. New Hampshire modeled the initiative after Berkshire Connect, which expanded affordable telecom services in Western Massachusetts. The Massachusetts Technology Collaborative created an affinity group of business and government Internet users, and since early 2000, Berkshire Connect has provided high-speed Internet and data services to its members through a new regional network constructed by a private vendor chosen through a competitive proposal process.[164]

Partner with communities to develop broadband "killer applications." States should focus not just on broadband supply, but also on demand. One way to boost demand is to catalyze the creation and use of broadband "killer applications" that have a public benefit. One place that is doing this is the city of Fort Wayne, Indiana, where Verizon has deployed an extensive fiber optic broadband network. The city is actively exploring a whole host of other broadband applications to improve the quality of life in the community, including applications in areas of public safety, health care, and education. For example, they have set up a system where retired nurses help provide health evaluations for low-income

residents without health insurance through means of two-way broadband connections.[165] Likewise, North Carolina's e-NC initiative focuses on using the Internet as a tool for helping people in rural North Carolina improve their quality of life. For example, e-NC Telecenters are driving technology-based economic development in seven rural North Carolina communities. They provide businesses, local governments, and community organizations with the most current technology resources and services, including high-speed Internet access, business services and support, such as business incubation, training programs, and public access computers, as well as opportunities for telecommuting and e-work.

Help Companies Be More Innovative

In a New Economy powered by innovation and knowledge, innovative, highly productive firms are the key to state success. While universities and broadband telecommunications can help, states need to put in place policies that directly help companies produce and use knowledge. To do that, they should:

Boost R&D tax credits, or create them if they don't exist. Studies show that the research and development tax credit is an effective way of stimulating private-sector R&D.[166] Moreover, state R&D tax credits appear to be even more effective than the federal credit. A recent study of the California R&D tax credit found that it stimulated considerably more R&D than the federal credit did, in part because it not only induced firms to perform more R&D, but also to relocate R&D to California.[167] Currently, 31 states provide a tax credit on company R&D.[168] Most state tax credits link to the federal R&D credit, which allows firms to take a credit of 20 percent on increases in R&D over a fixed base period. The state allows the firm to take a credit on the portion of the R&D conducted in the state. But while a few states have relatively generous credits (at 22.5 percent, Rhode Island has the highest rate, while Pennsylvania and Hawaii offer 20 percent), most are quite modest, averaging less than 5 percent. In contrast, small firms in the Canadian provinces of Ontario or Quebec receive a provincial credit of 40 percent on all R&D expenditures, not just incremental increases.

Create or increase tax credits for research investments at universities or federal labs. Because the result of company-funded research at universities is shared, the benefits are less likely to be fully captured by an individual firm. As a result, firms will underinvest in this kind of extramural research. And given the new realities of global competition, this is exactly what appears to be happening. In 2004, the amount invested by firms in research at U.S. universities fell for the first time.[169] As a result, states should institute more generous tax credits for company expenditures on research at universities or federal labs. At least one state, Massachusetts, has done this, by establishing a 15 percent tax credit for basic research expenditures at universities compared to its regular 10 percent credit.

Create a Statewide Commercialization and Entrepreneurship Organization. Commercialization and entrepreneurship are keys to success. To maximize both, there should be at least one organization in a state that has enhancing both as its mission. One model is Oklahoma's non-profit i2E organization. Through its various programs, i2E helps Oklahoma companies with strategic planning assistance, networking opportunities, and access to capital. i2E's Oklahoma Technology Commercialization Center assists researchers, inventors, entrepreneurs and companies turn advanced technologies and high-tech start-up companies into growing companies. It also runs an annual entrepreneurship competition open to all faculty and students at Oklahoma universities.[170] Likewise, Pennsylvania's Ben Franklin Technology Partners have over their 25-year history evolved to serve as a statewide resource for technology commercialization for entrepreneurs.

Support an innovation-focused manufacturing extension partnership program. The innovation economy is not just about the latest technology-based start-up. It is also about traditional manufacturers innovating to succeed, both by putting in place the latest shop floor technologies and developing new products. And while some of the decline in manufacturing employment has been because it has enjoyed higher productivity growth, part of it has been because of the growing trade deficit in goods. Therefore, states should not give up on manufacturing. Not only does it often provide relatively high-paying jobs, particularly for non-college educated workers, but employment could also grow if the trade deficit in manufacturing goods were to fall.

The federal Manufacturing Extension Partnership (MEP) program provides valuable support to a nationwide network of extension centers focused on helping small and medium-sized manufacturers better compete. But MEP centers have for too long focused narrowly on serving as consultants for bringing off-the-shelf technologies to small and medium manufacturers and not sufficiently on helping small and medium sized manufacturers develop new products or access new global markets. But to do so, they will need to change their approach, staff skills, and willingness to work from the "bottom up" with many more experienced groups and organizations involved in

technology development and export promotion throughout the country.[171] As a result, states should not only provide their share of matching funds but also provide additional support to enable MEP centers to help manufacturers develop new products and find new markets. For example, the Hosiery Textile Center, located on the campuses of two community colleges in western North Carolina, helps the large number of local hosiery firms (as well as firms located in other parts of the country) to compete in a global environment through training, R&D, testing, e-commerce, environmental services, and new product development.[172] Where appropriate, the MEP program should partner with states in development of such sector-based support programs.

CO-INVEST IN THE SKILLS OF THE WORKFORCE

States need to adopt policies to ensure that companies in the United States have the skilled workers they need to be productive, while simultaneously ensuring that American workers have the skills they need to navigate, adapt, and prosper in the New Economy. States can do several things to improve the skills of the workforce:

Improve the Quality of Teaching in Colleges and Universities

In an economy where more than 60 percent of high school graduates attend college, and where many jobs require the kinds of skills taught in college, it is critical that a state's colleges and universities are focused on the highest level of excellence in teaching undergraduates. Unfortunately, this is often not the case. As the recent Spellings Commission report on the future of higher education noted, "There are also disturbing signs that many students who do earn degrees have not actually mastered the reading, writing and thinking skills we expect of college graduates. Over the past decade, literacy among college graduates has actually declined."[173]

There are a number of reasons for this, but perhaps the most important is that in many colleges and universities, faculty are held accountable not for the quality of their teaching, but their production of peer-reviewed scholarly publications. Teaching, and ensuring that students can think, write and perform at the highest levels, is often an afterthought.

Solving this problem will not be easy. Nor is it clear exactly what the right remedy is. But there is one helpful and easy step states should take. States should require any higher education institution getting state support to participate in the National Survey of Student Engagement (NSSE) and make the results public. The NSSE, initially launched with support from The Pew Charitable Trusts, is designed to obtain, on an annual basis, information from scores of colleges and universities nationwide about student participation in programs and activities that institutions provide for their learning and personal development, including their views of the quality of teaching.[174] The results provide an estimate of how undergraduates spend their time and what they gain from attending college. Survey items reflect behaviors by students and institutions that are associated with desired outcomes. Yet, what is remarkable about the survey is that participating institutions generally do not release the results so that parents and students can benchmark them against other universities and colleges. Requiring that this information be made public would put pressure on colleges and universities to improve their undergraduate teaching. States should also require state supported colleges and universities to report the completion rate and time to degree for each degree program, disaggregated by gender, race, and ethnicity.

Increase the Supply and Quality of Scientists and Engineers

If America and states are to succeed in the innovation-powered global economy, boosting science, technology, engineering and mathematics (STEM) degrees is particularly important. The number of Americans majoring in math and science has failed to keep pace with demand. The only factor keeping severe shortages from occurring has been foreign immigration of scientists and engineers. But America may not be able to depend on this pipeline in the future, as other nations, such as China and India, are becoming more attractive and are experiencing less brain drain.[175] More STEM degrees would spur both national and state growth. Goldstein finds that higher percentages of graduate science degrees among all degrees awarded in a region are associated with increases in per-worker earnings.[176] States could take three steps to expand the supply of scientists and engineers:

Encourage universities to institute Professional Masters of Science and Engineering programs. As subdisciplines within sciences emerge and industry expresses needs for employees with particular skills, universities have begun to establish professional masters degree and certificate programs as a means of preparing a needed workforce or as a means of mid-career change for professionals in such fields as biotechnology, nanotechnology, and computer sciences. Because of this rise of interest, particularly in the sciences, the Sloan Foundation launched a Professional Master's Degree project in 1997. The program has grown to more than

1,300 students enrolled in more than 100 programs distributed among more than 50 universities. These programs tend to be more interdisciplinary than traditional doctoral programs and provide an alternative to doctoral education for students who enroll in them. States should work to expand these programs and create new ones, especially programs that have stronger ties to industry, such as engineering co-op programs and internships.[177]

Tie state higher education funding to increases in degrees awarded in STEM fields. A significant share of college students intending to major in STEM fields do not graduate with STEM degrees. States can help encourage universities and colleges to do a better job of increasing STEM degrees by rewarding institutions that increase STEM degrees. For example, Ontario's Technology Opportunity Program provided $228 million over 3 years, matched by $136 million from the private sector, to universities and colleges that commit to meeting goals for significantly increasing enrollments in fields such as electrical engineering, computer and software engineering, communications engineering and computer science.

Create and expand specialty math and science magnet high schools. Policy makers are increasingly focused on increasing the number of scientists and engineers, and toward that end on improving science education in high school. Perhaps the most effective strategy to achieve that is to expand the number of students enrolled in specialty math and science high schools. Several states have established high schools with an emphasis on mathematics, science and technology, such as the North Carolina School for Science and Mathematics in Durham and the Illinois Mathematics and Science Academy in Aurora. Other states have worked with local school districts to establish schools, such as Thomas Jefferson High School in Alexandria Virginia and the Eleanor Roosevelt High School in Greenbelt, Maryland. These schools are a powerful tool for producing high school graduates with a deep knowledge and strong passion for science and math that translates into much higher rates of college attendance and graduation in scientific fields.[178] Moreover, there is evidence that they are able to engage women and minorities in STEM fields more effectively than traditional high schools. As a result, states should provide incentives for local school boards to establish and expand specialized math and science high schools.

Increase the Skills of Incumbent Workers

The shift to more knowledge and innovation-intensive activities does not mean that it is sufficient to educate more college graduates. States also need to ensure that all workers have the higher skills they and their employers need. There are several things they can do:

Co-invest in industry-led regional skills alliances. The workforce development system, largely supported by the federal government, has historically done a poor job of working closely with employers. To the extent that states work directly with firms, they tend to use training dollars as part of recruiting or "retention" deal-making, and simply end up subsidizing a company for the training it would have undertaken anyhow, and it rarely leads to significant improvements in worker skills and productivity. Regional skills alliances (RSAs) address both limitations by creating industry-led partnerships that address workforce needs in a specific region and industry sector.[179] Several states have aggressively moved in this direction. Michigan has provided competitively awarded startup grants and technical assistance to 25 industry-led regional skills alliances. Pennsylvania's $15 million Industry Partnerships program brings together multiple employers in the same industry cluster, and workers or worker representatives when appropriate, to address overlapping human capital needs. To date, the state has helped support 86 industry training partnerships in different sectors. Washington State established its system of skills panels that engage businesses to devise strategies to close skill gaps by creating public-private partnerships among business and labor representatives from a specific industry and educators serving that industry.[180] One example there is Yakima County's Lean Manufacturing training initiative, which has worked with more than 50 companies and more than 330 employees to help companies understand and implement lean manufacturing practices. In many of these cases, community colleges play a key role in not only providing industrially-relevant training, but also serving as hubs for these skills alliances.

Create incumbent worker training programs funded through a supplemental unemployment insurance tax. A number of states, including California, Delaware, Indiana, Minnesota, Massachusetts, New Jersey, Rhode Island, and Tennessee, assess a small surcharge on the unemployment insurance (UI) tax to pay for employer-based training. For example, Rhode Island assesses an additional 0.2 percentage point surcharge on employer UI taxes to fund an employer-based training grant program. Much of the training funds go to joint company projects targeted to upgrading the skills of workers in key industrial sectors. These programs not only improve company productivity and reduce the risks of layoffs; they provide skills to workers so that if they are laid off they can get back to work more quickly.

Establish tax credits for company investments in workforce development. Many companies find that a significant share of their workforce lacks needed skills. Yet, because workers are so mobile, switching jobs on average every four years or less, companies have less incentive to invest in education and training. As a result, states should create a tax credit for company investments in training. Since 2001, Arizona has had a training tax credit dedicated to IT that is targeted to encourage people to enter tech careers. California has a deduction for training expenses if a company has spent a certain share of sales on training. Firms in Rhode Island can deduct up to 50 percent of training costs on their corporate income taxes.[181] To be eligible for these credits firms should provide training to non-highly compensated workers.

CULTIVATE ENTREPRENEURSHIP

In an economy where growth and competitive advantage increasingly comes from innovation, entrepreneurship has become more central to the success of regional economies. With states less able to prosper by attracting businesses from out of state, they increasingly must look within, and expanding entrepreneurship will be a key part of that strategy. Entrepreneurship is important because, even if regions have a strong knowledge infrastructure, it will be difficult to translate that knowledge into growing businesses without entrepreneurial energy. Entrepreneurs, and for that matter top executive talent, are the mechanism by which ideas get translated into commercial success.[182] Without entrepreneurship, innovation yields significantly fewer local economic rewards. A case in point is Rochester, New York which performs extremely well on a host of innovation indicators (patents, R&D, scientists and engineers), but poorly on translating those inputs into growing businesses.[183] Moreover, entrepreneurship has an additional advantage: it tends to be "sticky," with local entrepreneurs usually growing their firms in the state in which they live. For example, more than 80 percent of scientists in California research institutions that started their own firms did so in California.[184]

Unfortunately, most state economic development efforts place significantly less emphasis on entrepreneurship than is warranted. The reason is simple: all else equal, states focus on bigger projects. If a state could create 1,000 high-paying jobs through entrepreneurship or 500 by attracting a "trophy" industrial relocation, most would take the latter path because the results would be more visible. There is no ribbon to cut and no press release to issue when an entrepreneur gets a capital infusion and hires 10 new employees. Of course, the media is partly to blame for this state of affairs as they are more prone to cover significant economic development events, rather than the slow and steady, but more important, process of growth from within through tens of thousands of small steps.

What makes a region entrepreneurial remains a bit of a mystery. It is clear, however, that higher levels of research and development in a region are correlated with higher levels of new firm formation and fast growing firms. One study of metropolitan areas found that there is a significantly higher level of R&D investment in the most entrepreneurial regions.[185] Higher levels of education are also an important factor, as regions with a greater proportion of college-educated residents see higher rates of new firm formation, particularly in traded service sectors and high-skill sectors. Moreover, while innovation and human capital stimulate entrepreneurship, the combination is even more effective, as there are positive interactions between the two.[186]

At its core, entrepreneurship is driven by individuals who are willing to take risks and able to execute their plans. And while it is difficult for states to affect these factors, states can make entrepreneurship and new business formation easier for individuals.

Provide digital tools that make it easy to start a new business. Starting a new business is typically not easy. Would-be entrepreneurs must usually file an array of forms with local, state and federal agencies. States could ease new firm formation by providing an online software tool to guide individuals starting a new business (or a non-profit organization) through the complex process of filing local, state and federal forms. Other governments are working on this process. The Canadian government, for example, recently created a private foundation to create and administer such a program for Canadian entrepreneurs. Ohio's Business Tax Reform Project reengineered government processes and improved online services into a single continuum of effort. Business taxpayers save significant time and expense because information common to all municipalities is entered once and distributed to all appropriate entities. Previously, businesses had to understand and comply with a patchwork of requirements and processes across the range of municipalities in which they conduct business.

Link together the array of information resources for entrepreneurs. Information and technical assistance can help entrepreneurs be more successful, and there is an array of information resources that entrepreneurs can use. However, finding and gaining access to the right information and help

can be difficult. In order to be effective, entrepreneurship support efforts must be more user-driven, engaging entrepreneurs in peer-to-peer learning and networks, with very case-specific and hands-on learning. There are a number of efforts underway to accomplish this goal. The Kauffman Foundation has funded KCSourceLink, an online network of 140 non-profit resource organizations that provide business-building services for small businesses in the 18-county Kansas City region. It facilitates the linking of these resource organizations to one another and to established, emerging and start-up small businesses.[187] Similarly, the Kentucky Entrepreneurial Coaches Institute focuses on 19 rural Kentucky county economies by identifying and training community citizens from across the region who are willing to work with current and potential entrepreneurs to encourage the development of new business ideas and ventures.[188]

Expand entrepreneurship training. While successful entrepreneurs appear to have particular skills and attitudes, this does not mean that steps cannot be taken to help more people become successful entrepreneurs. One is to expand entrepreneurial education programs. A number of colleges and universities have created entrepreneurial education programs, often within their business schools. Some universities are going even farther and integrating entrepreneurship training throughout their curriculum. At MIT, more than 1,300 students take a course involving entrepreneurship. George Mason University's Mason Enterprise Center is developing an entrepreneurship curriculum that is designed to be integrated into every school and major. States should support the creation of these kinds of programs. But states should also support non-college-based entrepreneurial training programs. One model is the FastTrac training program, provided by partner organizations in 49 states. Established by the Kauffman Foundation, more than 95,000 participants have completed FastTrac classes in the United States since 1993.

Help entrepreneurs gain access to capital, particularly equity capital. Even though the United States has the most well-developed venture capital markets, significantly less is invested in zero and first-stage venture deals than a decade ago.[189] Moreover, venture capital is highly concentrated in a few states. As a result, states can and are playing important roles in ensuring access to early stage equity capital. In 2006, 44 states had established 155 programs investing more than $5.5 billion.[190]

However, if states are going to risk public monies, they should be able to participate in the upside of deals. One model for this is the Oklahoma Capital Investment Board (OCIB) which oversees the Oklahoma Capital Formation Corporation. OCIB borrows money from banks and invests them in VC firms that have indicated a willingness to invest in Oklahoma businesses. Since the program's inception, the number of venture funds actively investing in the state has increased from 1 to 14. Importantly, the state receives a full equity share for its investment.

Support angel capital networks. Angel capital, the capital invested by (usually) wealthy individuals in a region's businesses, is as important as venture capital in supporting entrepreneurship.[191] States can play a key role by helping to link angels and entrepreneurs.[192] For example, the Wisconsin Angel Network (WAN) represents more than 200 individual investors and helps match them with start-up and young companies. Similarly, Pennsylvania's Ben Franklin Investment Partners guarantees up to 25 percent of any loss experienced by a qualified private investor who makes an investment in a qualifying Southeastern Pennsylvania emerging technology enterprise. A number of states also provide a modest tax credit to angel investors for investing in an in-state firm.

Focus special attention on gazelles. Gazelles are fast growing companies that have doubled in size in four years. They are especially important to state economic development because most small businesses are not growth businesses, and most jobs are created by a relatively small number of gazelles.[193] Given that states have limited resources, it makes more sense to help firms that are likely to grow rapidly and hire a larger number of employees than those that are not. The challenge, however, is to find these gazelles. States should use ES202 data (unemployment insurance tax records that firms file every quarter) to identify fast growing firms.[194] Once identified, states should ask firms what kinds of help they need to grow and, if possible, provide that help. This does not mean that states should ignore other firms, especially higher-wage firms in traded sectors, but they should pay special attention to gazelles.

SUPPORT INDUSTRY CLUSTERS

In regional economies, the whole is often greater than the sum of the parts.[195] In other words, firms in related industries often cluster together in a particular region, allowing them to take advantage of common resources (e.g., a workforce trained in particular skills; technical institutes; a common supplier base). Clusters also facilitate better labor market matching.[196] Moreover, in a knowledge-based economy, having knowledge is not enough; it must be shared, and in many regions, clusters of firms that network and communicate are able to raise the

overall knowledge levels that they can draw upon more than if the firms were isolated and separate. These knowledge networks are a key factor for success for many regional economies, particularly urban ones, where there are more likely to be clusters of firms in related industries. Moreover, public policy can play a role in supporting the formation and development of clusters.[197]

Perhaps the best known cluster is Northern California's Silicon Valley, where a large agglomeration of high-tech firms, research universities, technical colleges, venture capitalists, and other supporting institutions makes it the world's most vibrant technology region. But Silicon Valley is not the only region with industry clusters: from the furniture cluster in Tupelo, Mississippi, to the jewelry cluster in Rhode Island and southern Massachusetts, to biotech clusters in places like Boston, Philadelphia and San Diego, to the automobile-related cluster in Southeastern Michigan, regional industry clusters abound. And as these examples show, clusters are not only made up of "high-tech" firms. In many cases "low-tech" firms benefit just as much from the learning and knowledge generated in clusters. Moreover, clusters aren't just in manufacturing, but also in a host of service sectors, including professional services (e.g., financial services in New York), media (movies and music in Hollywood), software (Seattle) and tourism (gaming in Los Vegas). While clusters don't seem to have an impact on job growth, they do appear to have a positive impact on wage growth. As a result, while states should avoid holding out clusters as the silver bullet leading to economic salvation, they should focus on supporting regional industrial clusters and encouraging rich inter-organizational learning environments.[198]

Catalyze and empower industry clusters. In many states, clusters of similar firms exist, but have little formal interaction with each other. States can help by organizing roundtables to bring industry leaders together to talk about common challenges facing their industry and the steps the state can take to help boost the cluster's competitiveness. They can provide small matching grants to help clusters establish industry self-help associations, either at the state or regional level. For example, as part of its efforts to create a statewide strategic economic plan, the Rhode Island Economic Policy Council brought together leaders from the state's software companies. With the help of a small state start-up grant, the companies formed an industry association that works to help all firms in the cluster become more competitive. In contrast to what some have argued, states do not need to limit their actions to support clusters where they already exist. Indeed, particularly in emerging technologies, such as nano-technology, gene-based medicine, and sustainable energy systems, as long as states have some strengths in these sectors on both the academic and industrial side, building successful new clusters is not out of the question.

Reorganize state programs around clusters. A cluster of firms, rather than the individual firm, is a much more logical point of economic development assistance for states. Working with entire clusters of firms is not only more cost-effective, but also helps boost the synergies and cross-firm learning that can transform low-performance clusters into high-performance ones. In addition, by working with clusters, states can "speak industry." In other words, state economic development officials are better able to understand the unique needs of particular industries and more effectively communicate with firms and help firms better engage in industry-based knowledge networks.

As a result, whenever possible, states should work with entire clusters of firms. For example, states should fund industry training programs through groups of firms with the same skill needs, as opposed to making grants to individual firms. They should reorient other programs, such as manufacturing extension, business finance, and technology transfer, around clusters. In addition, states should tie increased funding to community colleges and four-year colleges and universities based on how they meet the training and research needs of regional clusters. And to the extent that states continue industrial recruitment, it should complement a cluster strategy. Focusing on clusters or sectors of firms has enormous potential to help states better align resources and strategies, increase economic competitiveness, and increase labor market opportunities for all populations.

REDUCE BUSINESS COSTS WITHOUT REDUCING THE STANDARD OF LIVING

Recently, the idea that places can succeed by being attractive locations for knowledge workers (sometimes called the "creative class") has gained currency. This is a welcome alternative to the prevailing emphasis on developing a good "business climate," which all too often meant cutting costs without worrying about impacts on standard of living or quality of life. For example, while weak environmental regulations might make a place cheaper for business, they make it worse for residents.

Yet, while it's important for places to be attractive to knowledge workers, it's a mistake to see this as the Holy Grail.

At the end of the day, a region's prosperity is still more determined by firms than individuals. Firms (and organizations generally) are the predominant means by which value is created in a complex, developed economy. Moreover, the evidence suggests that the most important factors in attracting knowledge workers to a region are a growing economy, the presence of other knowledge workers, and knowledge job opportunities.[199] Quality of life can make attracting knowledge workers easier, but it's not enough. Places with a great quality of life but without an agglomeration of high value-added firms will not be as successful as places with both.

Moreover, this new focus on quality of life does not mean that states can afford to blithely ignore costs and their business climate. While innovation is more important than cost in determining economic success, cost is not unimportant. Business costs that are substantially higher than those of comparable locations need to be offset by business advantages, such as agglomeration economies or high-quality public services. Even if they are offset in this way, state and local governments should also try to lower business costs, but not in ways that lower the standard of living of their residents or their quality of life. This is not to say that high costs are a sign of failure. Some of the most successful regions in the nation have high costs, precisely because of their success at attracting workers. But this doesn't mean that lower costs in these places would not make companies there more competitive. While there are a number of areas states can take action in, perhaps the two that could have the largest potential impact are reducing traffic congestion and expanding the supply of housing.

Reduce Traffic Congestion

For many states, like California, Georgia, Illinois, Maryland, Massachusetts, New York and Washington, traffic congestion imposes large costs on residents and business. In 2003, road congestion cost Americans $63.1 billion in lost productivity and excess fuel consumption.[200] Moreover, traffic can be a make or break factor in enabling metropolitan regions to grow. For example, when Dell Computer considered where to locate a new production facility, one reason for its decision to locate the plant in Nashville, Tennessee, instead of Austin, Texas was the high level of traffic congestion in Austin.

There is considerable debate and disagreement about the best way to reduce congestion, or even if it should and can be reduced. In many places, policy makers have focused largely on demand-reduction strategies as the answer to congestion: particularly by encouraging more transit, bike paths, and "smart growth" land use strategies. Indeed, environmentalists and other anti-growth interests have succeeded in convincing many decision-makers and much of the public that "sprawl" is principally responsible for traffic congestion, that "new roads just make things worse," and that demand-reduction strategies alone (e.g., transit, car pooling, urban growth boundaries) can significantly improve mobility.[201] In fact, empirical evidence demonstrates that these claims are grossly exaggerated.[202]

This is not to say that governments shouldn't continue to work on demand-reduction strategies such as encouraging transit-oriented development and infill development; investing in transit, particularly more cost-effective bus rapid transit; supporting metropolitan-wide planning; and imposing impact fees on new developments equal to public sector costs. However, while demand-reduction strategies are needed, they are incapable of adequately responding to 20 years of failure to expand our metropolitan area highway infrastructure to meet the needs of a significantly larger and more mobile population. States can take several steps that will begin to return mobility to their metropolitan regions:

Expand road capacity in congested metropolitan areas. If states are serious about returning mobility to their residents, they will need to do more to increase the supply of transportation, particularly by building more roads and widening existing roads, especially in congested metropolitan areas. In most metropolitan areas, there are ample opportunities to widen existing highway arterials without having to claim new rights-of-way.

Use tolling to help pay for new lane and road capacity. Few states have the money to pay for both maintenance of existing infrastructure and expansion. As a result, they have not made the needed investments to expand transportation infrastructure to meet demand. The most efficient way to add new revenues is for states to increase user fees, such as gas taxes and vehicle registration fees. But even if states find the political will to do this, it won't be enough. As a result, states should also institute road-pricing systems. The ability to collect tolls on the fly with EZ-Pass systems (wireless transponders in vehicles) means that states can establish toll roads or toll lanes without impeding traffic flow. As a result, no new urban highway capacity should be built that is not at least partially funded by tolls.

Make congestion reduction a top priority and hold state DOTs accountable for results. Few states have made reducing road congestion a top transportation priority. Two that have are Georgia and Texas. The Texas Governor's

Business Council's Transportation Committee decided that congestion was the top priority and that progress could be made. As a result, Texas passed landmark legislation providing an arsenal of new financial tools that promise to vastly speed up transportation improvements.[203] The new law authorizes a $3 billion bond issue to be used for highway improvement projects. It also provides additional authority to the Regional Mobility Authorities (RMAs), enabling them to issue revenue bonds backed by tolls and to enter into comprehensive development agreements with private entities to design, construct and operate toll road facilities. The law also authorizes the Texas Transportation Commission to convert regular state highways to toll facilities and to transfer them to RMAs for operation and maintenance. Moreover, the Commission, acting under its new authority, directed the Texas Transportation Department to establish guidelines to evaluate all highways "in any phase of development or construction" for potential tolling. In Georgia, the Governor's Transportation Mitigation Task Force called for a major change in transportation planning for the greater Atlanta area. Instead of accepting a long-range transportation plan that would modestly restrain the growth of traffic congestion – while still permitting a large increase in congestion by 2030 – the Task Force called for reducing congestion by 2030 to well below today's level.[204]

Reduce Regulatory Barriers to Expanding the Supply of Housing

The other major factor raising costs in many regions is housing. While the housing bubble has now finally stopped expanding, housing costs remain extremely high in many metropolitan areas. For example, in San Francisco, in the third quarter of 2006, the median value of homes was $749,400. The median cost of a home in Washington D.C. was $431,900.[205] While there are multiple reasons for the increase in housing prices, a major cause is the same one leading to growing levels of road congestion. In a country with a growing population and an even faster growth in households, governments have not adequately ensured that there is an available supply of housing and land to build it on. The result is in many places a dramatic increase in land costs stemming from a shortage of land available for and zoned for development. Many of these shortages are a direct result of city and state policies. Many local jurisdictions use zoning and land-use planning to limit the supply of developable land or impose restrictions on development. They use a variety of measures from minimum lot sizes, overly strict wetlands and septic-system regulations, and outright growth caps. Such measures have a direct impact on reducing the supply of housing. For example, a study of such regulations found that they were responsible for a significant share of the increase in housing prices in the greater Boston, Massachusetts area.[206]

Indeed, many municipalities engage in a kind of fiscal zoning targeted on ensuring that only larger single family homes on large lots are built, since they generate higher tax revenues. These regulatory decisions, which may be in the interest of particular municipalities, end up being a prisoner's dilemma game for all municipalities. If all municipalities in a region made sure that there was enough land zoned for low and middle-income housing, then the entire region would have lower housing prices, with businesses and home buyers benefiting. But it's in the interest of individual municipalities to have other cities be home to low and middle-income housing, while they focus on high-taxpaying households that place lower demands on the public purse. The result is higher housing costs for everyone in the metropolitan region, raising the costs of new construction and resulting in higher wages having to be paid.[207]

Use incentives to encourage municipalities to zone for adequate middle class housing. States can take several steps to encourage localities to loosen these regulations. In addition, states should encourage cities to streamline their permitting process, particularly for lower income housing. Austin, Texas' SMART program does this, in part by allowing affordable housing projects to qualify for waivers from local development fees and to receive expedited review for development permits.[208] Massachusetts recently passed legislation giving the state the power to overrule local land use decisions in communities with low density levels, high price levels and few permits. While such programs help, to truly solve this problem, states will need to make state aid to local government contingent on the extent to which they favor or restrict new housing construction and enter into regional cooperative agreements to expand the supply of "build-ready" land for more middle class and affordable housing units. Cities would then have a clearer economic incentive to act in ways that benefit the entire region by expanding the supply of housing.

HELP BOOST PRODUCTIVITY

There is a reason why states recruit auto plants and not hair salons. The former are traded, bringing in outside revenue that support firms like hair salons that sell to local residents. Yet, as discussed above, states can get richer by changing their economic mix to higher value-added firms or by helping organizations boost productivity. As a result, states should work to help raise the productivity of all firms, especially non-traded firms. When a traded firm boosts its productivity, most

of the direct benefits go to its customers, most of whom are outside the state. (With higher productivity, the firm is able to be more competitive.) However, helping raise the productivity of local-serving functions, such as retail sales, raises the standard of living in a community, because most of the benefits go to local residents in the form of lower prices (and some to workers in the form of higher wages). While government has few direct tools to help business raise productivity (manufacturing extension programs are a notable exception), governments can and do enact rules and regulations that make it more difficult for industries to become more productive. As a result, there are several things states can do:

Dismantle regulations protecting middlemen from competition. Competition is tough, and no matter what businesses may say about their love of it, most would rather have less. And most are not shy about enlisting government to protect them from competition, often under the guise of seemingly well-intentioned purposes. And all too often states act on their behalf. Perhaps the most widespread area involves e-commerce. Businesses and professions in a wide range of industries, including wine, beer and liquor wholesalers; auto dealers; optometrists and opticians; pharmacies; mortgage brokers; and realtors are fighting against robust e-commerce competitors. The growth of these laws and regulations, many at the state level, that protect incumbent "bricks and mortar" companies from e-commerce competitors is a major threat to the growth of e-commerce.[209] For example, it is illegal in all 50 states to buy a car directly from the manufacturer, even though if such a direct business model were legal, consumers would save thousands of dollars on a new car. A number of states have passed laws at the behest of real estate agents making it illegal for real estate brokers to provide discounts to home sellers – a law aimed at eliminating Internet-based competitors The list goes on and on. While such laws might protect the jobs of a small number of politically connected business persons, they reduce the standard of living of state residents by raising the costs they must pay.

While state commerce restrictions have been most pronounced in the e-commerce area, they have not been confined to this. In response to pressures from gas stations, New Jersey bans self-service gas pumps, even though they would save New Jersey consumers hundreds of millions dollars a year. Several states have passed laws limiting price discounts on gasoline in an attempt to prohibit Wal-Mart from selling gasoline. A number of communities have passed ordinances to limit so-called "big box" retailers, even though they are significantly more efficient than smaller retailers and provide significantly lower prices.[210] States and communities should not try to protect one class of businesses against another, particularly businesses with lower productivity and higher prices.

Limit Premature and Unneeded Regulation of Promising Information Technology Applications. Information technology has been the driver of economic growth and productivity. By using information technology applications in new ways, organizations – public and private – have been able to increase efficiencies and boost quality, raising the standard of living for Americans.[211] Notwithstanding the progress that IT is enabling, all too often well-intentioned state policy makers are willing to consider laws and regulations that could slow digital transformation. For example, at least 7 states have introduced legislation to regulate or ban radio frequency identification technology (RFID) under the guise of privacy protection. Yet, RFID technology – a technology many nations are promoting – has the potential to significantly boost productivity in a wide array of areas, with minimal privacy implications.[212] Likewise, a number of states have passed ill-conceived legislation governing Internet privacy and data security that not only reduces the viability of e-commerce business models, but in many cases is overly broad and could have unintended side effects that make the problem being addressed even worse. Moreover, one of the distinguishing features of the digital economy is that e-commerce firms, even the very smallest, are by their very nature national, or even international, in scope. In this environment, having a patchwork of 50 different laws and regulations governing e-commerce will significantly increase costs and disrupt business, particularly for smaller firms that must devote proportionally more resources to complying with 50 different laws.

Create Next Generation E-government. While government has few direct tools to help business raise productivity, it can raise its own productivity. There are a number of steps states could take. They could create state productivity commissions to identify opportunities. They could develop financial reward schemes to agencies that boost their productivity so they get more than a lower budget the next year.

But perhaps the most promising step is to more aggressively push e-government transformation. As one author states, "E-competitiveness implies a civic commitment to achieve the highest quality standards in public services, the best uses of electronic applications within local government, [and] a culture that fosters innovation wherever it occurs."[213] States have used e-government to cut costs and improve quality. For example, eVA is an order-to-payment procurement system that is mandated across all Virginia commonwealth agencies.

By 2005, eVA offered 933 catalogues, from which state agencies, a captive audience, are able to compare prices and features on more than five million products. eVA end-to-end transactions handled $1 billion in purchases by its second anniversary (September 2003). Likewise, Kansas Online Crash Logs streamlined the Kansas Highway Patrol's process of recording and distributing crash information by reducing the amount of paperwork dispatchers complete, as well as dramatically reducing phone calls from the public and media. Now the media and public can check crash logs often and view the most current, accurate crash information without impacting the daily operations of the dispatchers.

REORGANIZE ECONOMIC DEVELOPMENT EFFORTS

The New Economy has driven business reorganization. In order to compete, businesses have become flatter, faster, and more collaborative. As the nature of economic development changes, the New Economy should be driving reorganization of state economic development efforts along similar lines. The old model of economic development, driven largely by state departments of commerce engaged mostly in smokestack chasing, is long past being useful. There are at least three main opportunities for organizing economic development in new ways:

Link workforce and economic development. Historically economic development and workforce development have been separate. Workforce development served disadvantaged individuals while economic development recruited industry. But now that workforce development focuses more on boosting skills of incumbent workers and economic development focuses more on growth from within, there is considerable overlap between the two missions. As a result, states should consider more closely aligning the two functions.[214] Examples range across a spectrum of full integration of economic development and workforce development (e.g. Kansas and Michigan) to the placement of the workforce policy board in economic development (e.g. North Carolina and Oklahoma) to a broad alignment of resources and strategies (e.g. Pennsylvania). States can also help drive this integration at the sub-state level. For example, Illinois provided grants to regions to encourage them to combine workforce and economic development regional boundaries. Michigan's Regional Skill Alliances provided seed money to areas to work across agency boundaries to identify labor market solutions.

Proactively use the Internet to provide business assistance. Too many state economic development agencies still look at the Internet as a tool to market their own agencies' programs and tools, rather than serving as a gateway to the best information and resources, even if it's not provided by the state agency. Even among states that attempt to provide links to other resources, most do a poor job. States need to stop looking to the Web as an electronic version of an organizational newsletter and rather start using it as a tool to create a network of resources of value to their business community.

Some states are beginning to use their websites in this way. For example, the Illinois Entrepreneurship Network (IEN) is a portal maintained by the state that links individual entrepreneurs and companies to both state and other websites for business services.[215] Other examples include the Wisconsin Entrepreneur Network and Minnesota Entrepreneurial Gateway.[216] But states could go much further. For example, they could develop a one-stop business assistance web portal and print the site's URL on all paper correspondence sent by the state to business (e.g., tax forms). The site could include links to all business assistance programs (e.g., business financing, training, export assistance, technical assistance, etc.) from all levels of government (local, state and federal), searchable by zip code. It could contain a one-stop business formation site where new businesses can register with all state (and local) agencies at once (e.g., revenue department, unemployment insurance, incorporation). It might even have a mutual business assistance function, whereby businesses could post queries online and other businesses could answer them (e.g., "does anyone know the best way to get into the federal procurement schedule?").

Empower the private sector and non-profit organizations as economic development service delivery organizations. State governments are good at many things, but one of them is typically not the provision of direct services to firms. In this case, more flexible, non-profit organizations can often do a better job. But to be more effective they need to be collaborative, customer-driven, often sectoral-focused, and able to understand and be "in" the marketplace. In particular, these new kinds of development organizations need to "speak business." In other words they must be able to get to know particular clusters or sectors. For example, Cleveland's WireNet is a local trade association that is also a service provider that provides expertise responsive to manufacturers, and connects leaders to each other and engages them in their communities.[217] New York's Garment Industry Development Corporation provides marketing, buyer referrals and training and technical assistance to New York apparel manufacturers

and workers. The Utah Technology Council provides regular Peer-to-Peer forums, educational clinics, and corporate partnerships for its member companies to help them be successful.[218] In these and other cases, non-profit, industry-led organizations receive help from the state to help firms in key industries.

ENLIST FEDERAL HELP

In the new global economy, many now claim that the actions of states and metropolitan areas will play the key role in determining innovation and national competitiveness. In fact, some even argue that much of economic policy should be decentralized to the regional level.[219] To be sure, as urban agglomerations and knowledge sharing have become more critical components of a nation's economic success, the actions of states and regions have assumed greater importance in determining national competitiveness. However, it is a dangerous illusion to believe that state or city policy actions alone can solve the U.S. competitiveness challenge. Unless the federal government also acts and develops an effective national innovation and competitiveness strategy, all the state and city actions in the world will not be enough. In short, state (and to a lesser degree city) economic development policies play a necessary, but not sufficient role in national competitiveness.

This is true for two key reasons. First, addressing the competitiveness challenge will require considerably more public investment than states and cities can afford. The resources available to the federal government, even in an era of budget deficits, are considerably more than those available to the states and cities combined. While states might invest several billion dollars in R&D, the federal government invests upwards of $70 billion. While states might provide R&D tax credits and other corporate tax incentives, the federal corporate tax rate is several times greater than state rates. Second, addressing the competitiveness challenge will require more than action at home, it will require action directed abroad to dramatically reduce unfair and protectionist foreign trade practices. Only the federal government can prosecute a more proactive trade policy that fights foreign mercantilist actions, including currency manipulation, closed markets, intellectual property theft, standards manipulation, high tariffs, forced offsets for market access, and other unfair trading practices.[220]

To date, unfortunately, the discussion of the state and federal role in competitiveness has largely been kept separate. States do their thing, the feds theirs. It's time for a new state-federal partnership for innovation and competitiveness. Both parties bring valuable resources to the table. The federal government is able to marshal resources and drive incentives so that state actions benefit the entire nation, rather than simply redistributing economic resources within the nation. But in an economy where economic policy increasingly must focus on firms, industries, and knowledge-enhancing institutions, as opposed to simply managing the business cycle, states are ideally situated as they are closer to firms, especially small and medium-sized enterprises, and have more control over some innovation infrastructure inputs (such as public higher education).[221]

However, an effective partnership will not be possible unless the federal government begins to see states and regions as important partners. All too often the feds believe that there is one uniform national economy where regional agglomerations are a side show at best. Moreover, to the extent states and regions even have a policy role, it's too often to follow the federal government's lead. A true partnership will require that federal decisionmakers and program managers understand that states and regions can play an important role and that a top down, one-size-fits-all federal approach will only stifle the most important role states and regions can play: generating policy innovations and developing policies and operating programs suited to the unique requirements of their regional economies. Given this new understanding, the federal government should maintain and even expand support for key programs such as the Manufacturing Extension Partnership, the Small Business Innovation Research Program, the Small Business Investment Company Program, and the Advanced Technology Program. In addition, there are at least two new areas of partnership that would have important implications:

Create a $250 million State Industry/University Cooperative Research Center Program. Building an effective and more than symbolic state-federal innovation and competitiveness partnership will take a number of forms. However, one immediate step that states should take is to press Congress to allocate a significant share of the planned expansion of the National Science Foundation (NSF) budget to expanding and reforming the Industry-University Cooperative Research Center (I/UCRC) program. The program has been in operation for almost thirty years and is highly effective, but dramatically underfunded, with NSF support per center averaging just $100,000.[222] Moreover, recent changes by NSF regarding industry and university cost-sharing may reduce the effectiveness of the program. As a result, Congress should transform the I/UCRC program into a State/IUCRC program

building on the successes and lessons learned from an earlier attempt at such a partnership.[223] At the same time, it should increase the funding from the paltry $7 million per year to a more significant amount. Investing around $250 million per year would allow centers to expand in size and quantity. State governments would be required to match funding two dollars for every three dollars from NSF. Considering that industry support of university research is at its lowest level in thirty years, a federal investment in this type of partnership would certainly be timely. However, for the program to work effectively, it must be a true partnership with states, not just another NSF program that ignores states. Therefore, Congress should require that the program be governed by a board made up of equal representation of state and federal officials.

Create a Federal-State Economic Data Partnership. To effectively craft and implement state economic development strategies for the New Economy requires data, particularly about the actions of firms. However, by and large the provision of sub-national data by federal statistical agencies is at best an after-thought. All too often federal data sample frames are not large enough to make data available at the state or metropolitan level. In other cases, the federal government does a poor job of making data easily available to state and local users, or it is in incompatible forms. For example, after almost 10 years of using the new NAICS industrial classification codes, the Patent Office still collects patent data using the old, incompatible SIC codes. State economic policy analysts wanting to understand patenting in their states have to spend valuable time matching data. As a result, states, and even more so metropolitan areas, are limited in their economic development analysis by lack of federal data.[224]

Moreover, for regions trying to understand the process of industrial innovation the data are maddeningly limited. Federal data indicators are largely confined to input measures such as R&D and patenting. But innovation is not just something that high-tech firms do; all firms and all industries can innovate. As a result, there is significant need for better indicators of innovation, including measures such as number and value of new products and services introduced, new capital equipment purchased, use of e-commerce business models, and other such organizational innovation indicators. In order to remedy these deficiencies, states should press Congress to establish and fund federal-state economic data partnerships designed to significantly improve the quality of sub-national federal economic and innovation data within three years of enactment.

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 the challenges 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 generate New Economy policy innovations and drive the kinds of institutional changes needed to implement them. And it's this last challenge that is key. Success in the New Economy requires that a whole array of institutions – universities, school boards, firms, local governments, 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.

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State IPO Totals: Renaissance Capital's IPOHome.com. <www.ipohome.com>.

Worker Earnings: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts* (2004). <www.bea.gov/bea/regional/data.htm>.

Page 36 Indicator: Entrepreneurial Activity

Entrepreneurs: Robert W. Fairlie, "Kauffman Index of Entrepreneurial Activity: State Report 2005," *Ewing Marion Kauffman Foundation* (2006). <www.kauffman.org/pdf/KIEA_state_052206.pdf>.

Page 37 Indicator: Inventor Patents

Patents: U.S. Patent and Trademark Office, "Independent Inventors by State by Year: Utility Patents Report," (March 2005).

Workforce Age Population: U.S. Census Bureau, "PUMS," *American Community Survey*, (2005). <www.census.gov/acs>.

Page 39 Indicator: Online Population

Households Online: U.S. Department of Commerce, National Telecommunications and Information Administration, *A Nation Online: Entering the Broadband Age* (September 2004).

Page 40 Indicator: Internet Domain Names

Registrations: Matthew Zook, University of Kentucky.

Total Firms: U.S. Small Business Administration, Office of Advocacy, "Small Business Economic Indicators, 2003."

Page 41 Indicator: Technology in Schools

Education Week, "Technology Counts 2006," (May 2006). <www.edweek.org>.

Page 42 Indicator: E-Government

Center for Digital Government, *The Digital State 2006*. <www.centerdigitalgov.com/surveys.php?survey=states>. Data made available by Paul W. Taylor.

Darrell M. West, "State and Federal E-Government in the United States, 2006," Taubman Center for Public Policy (August 2006). <www.insidepolitics.org/egovt06us.pdf>.

Page 43 Indicator: Online Agriculture

U.S. Department of Agriculture, "Farm Computer Usage and Ownership," (2005). <usda.mannlib.cornell.edu/usda/current/FarmComp/FarmComp-08-12-2005.pdf>.

Page 44 Indicator: Broadband Telecommunications

Broadband Lines: Federal Communications Commission, "High-Speed Services for Internet Access: Status as of June 30, 2005," (April 2006).

Establishments: U.S. Census Bureau, *County Business Patterns* (2004).

Households: U.S. Census Bureau, *American Community Survey* (2005). <www.census.gov/acs>.

Page 46 Indicator: High-Tech Jobs

High-Tech Jobs: AeA, *Cyberstates 2006* (Washington DC: 2006), and U.S. Department of Labor, Bureau of Labor Statistics, *Quarterly Census of Employment and Wages*, (2004). <www.bls.gov/cew>.

Total Employment: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts* (2004). <www.bea.gov/bea/regional/data.htm>.

Page 47 Indicator: Scientists and Engineers

Scientists and Engineers: National Science Foundation, *Science and Engineering State Profiles* 2003-2004 (May 2006). <www.nsf.gov/statistics/nsf06314>.

Total Employment: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts* (2003). <www.bea.gov/bea/regional/data.htm>.

Page 48 Indicator: Patents

Patents: United States Patent and Trademark Office, *Patent Counts by Country/State and Year: Utility Patents* (2005).

Employment: U.S. Department of Labor, Bureau of Labor Statistics, *Quarterly Census of Employment and Wages* (2005). <www.bls.gov/cew>.

Page 49 Indicator: Industry Investment in R&D

Industry R&D: National Science Foundation, *Science and Engineering Indicators* (2006).

Employment: U.S. Department of Labor, Bureau of Labor Statistics, *Quarterly Census of Employment and Wages* (2003). <www.bls.gov/cew>.

Worker Earnings: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts* (2003). <www.bea.gov/bea/regional/data.htm>.

Page 50 Indicator: Venture Capital

Venture Capital: PricewaterhouseCooper/Venture Economics/NVCA MoneyTree Survey (2006).

Worker Earnings: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Accounts* (2004). <www.bea.gov/bea/regional/data.htm>.

Appendix: Weighting Methodology

Raw scores were calculated for each state for each indicator. In the composite analyses, the indicators were weighted according to their relative importance and so that closely correlated indicators do not bias the results. Scores for each indicator were based on the standard deviation of each from the mean score of all of the states to measure the magnitude of differences between states and not just their ranks.

Weighting factors for final score:

KNOWLEDGE JOBS	**Weight**
Information Technology Jobs	0.75
Managerial, Professional, and Technical Jobs	0.75
Workforce Education	1.00
Immigration of Knowledge Workers	0.50
Manufacturing Value-Added	0.75
High-Wage Traded Services	0.75
Total	**4.50**
GLOBALIZATION	
Export Focus of Manufacturing and Services	1.00
FDI	1.00
Package Exports	0.50
Total	**2.50**
ECONOMIC DYNAMISM	
"Gazelle" Jobs	1.00
Job Churning	0.75
Fastest Growing Firms	0.50
IPOs	0.75
Entrepreneurial Activity	0.75
Inventor Patents	0.50
Total	**4.25**
DIGITAL ECONOMY	
Online Population	0.75
Internet Domain Names	0.60
Technology in Schools	0.50
E-Government	0.50
Online Agriculture	0.50
Broadband Telecommunications	1.00
Total	**3.85**
INNOVATION CAPACITY	
High-Tech Jobs	0.75
Scientists and Engineers	0.75
Patents	0.75
Industry Investment in R&D	1.00
Venture Capital	0.75
Total	**4.00**

1 Robert D. Atkinson, *The Past and Future of America's Economy: Long Waves of Innovation that Power Cycles of Growth* (Northampton, MA: Edward Elgar, 2004).

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

3 Based on currency purchasing-power-parity measurement.

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

5 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).

6 Kevin Kelly, *New Rules for the New Economy* (New York: Viking, 1998): 156.

7 Kevin Maney, "The Networked Economy Changes Everything," *USA Today* 16 Nov. 1998: 1E.

8 Atkinson, op cit. (2004): 8-9. See note 1.

9 "The Pew Internet & American Life Project February 2004 Tracking Survey," (Princeton Survey Research Associates International, Pew Internet & American Life Project, 2004).

10 Organization for Economic Co-operation and Development (OECD), "Internet Traffic Exchange: Market Developments and Measurement of Growth," (Paris: Organization for Economic Co-operation and Development, 5 Apr. 2006).

11 Carlota Perez, *Technological Revolutions and Financial Capital* (Northampton, MA: Edward Elgar, 2002): 36.

12 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). See note 1.

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

14 Robert D. Atkinson, *The 2002 State New Economy Index* (Washington, D.C.: Progressive Policy Institute, 2002). <www.neweconomyindex.org>.

15 It is also true that nations can grow if their terms of trade with the world improve. For example, if the price of oil goes up significantly, oil exporting nations will grow (by being able to get more imports in exchange for its exports). However, for most countries (and states) this factor is not a major determinant of growth.

16 Carnevale and Desrochers forecast that a worker shortage gap will start to appear in 2005 and grow to 5.3 million workers by 2010 and 14 million by 2020. They state, "The shortage won't just be about having to cut an extra shift. It will be about not being able to fill the first and second shift too." Anthony P. Carnevale and Donna M. Desrochers, "Standards for What? The Economic Roots of K-16 Reform," (Educational Testing Service, 2003) cited in *Foresight 44* (2005).

17 One way to think about this albeit confusing issue is as follows. Assume for the sake of argument that baby boomers do not live long enough to retire. In this case, there is no labor force implication because existing younger workers would be producing for themselves. Now assume that baby boomers do live long past retirement age, but their incomes are 50 percent less than before. Now demand for workers goes up because someone has to make the products and services that retirees will consume. But all of the income from retirees comes from current workers (through either the taxes they pay for Social Security and Medicare, the interest they pay on loans, or the higher prices they pay on products from the dividends on stocks going to retirees). Another way to explain this idea is that all of the products and services consumed by retirees are produced by workers in near real time. If there were no retirees, therefore, current workers would earn more because they could "keep" all of their production. With retirees, workers' relative income is less, and with it, their relative consumption, and labor demand.

18 One reason is that while it took four farmers to feed ten people in 1900, today four farmers can feed 388 Americans.

19 This does not mean that distributional issues are not important. Indeed, there is disturbing evidence that the distribution of income has become more unequal over the last several decades. See Robert D. Atkinson, "Inequality in the New Knowledge Economy," in *The New Egalitarianism*, Anthony Giddens and Patrick Diamond, eds., (London: Polity Press, 2005.)

20 To see why, consider a state in which average productivity among existing firms increases 2 percent per year for 5 years. After 5 years, state productivity is up by almost 11 percent. To achieve a similar increase in total productivity through an industry mix strategy, a state would have to replace 20 percent of its jobs with average value-added per worker with jobs having a value-added of over 50 percent more, an unlikely transformation at best.

21 Michael E. Porter, "The Economic Performance of Regions," *Regional Studies* 37.6-7 (Aug./Oct. 2003): 568.

22 In 2001 dollars. Michael J. Mandel, "Restating the '90s," *BusinessWeek* (1 Apr. 2002): 56. <www.businessweek.com/magazine/content/02_13/b3776001.htm>.

23 For example, Oliner and Sichel found that the use of computers and the production of computers added two-thirds of the 1 percentage point step up in productivity growth between the first and second half of the decade. Steven D. Oliner and Daniel Sichel, "The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?" *FEDS Working Paper* 2000-20 (Social Science Research Network, 17 Mar. 2000).

24 For more information, see Atkinson and McKay, op cit. (2007). See note 5.

25 For example, Apple's decision to roll out its new video iPod was a decision that was largely enabled by the rapid fall in price and expansion in capacity of digital storage. As technology continues to improve it will enable improvements in a wide array of areas, such as better voice, handwriting and optical recognition; better intelligent agents that routinely filter and retrieve information based on user preferences; and expert systems software to help make decisions in medicine, engineering, finance, and other fields. Moreover, new software applications such as service-oriented architecture and web services allow organizational functions to be broken down into standard, re-usable components, significantly improving efficiencies.

26 "Comparative Estimates: Broadband Households in the US, 2004-2010," in *Worldwide Online Access: 2004-2010* (eMarketer.com, 1 May 2006).

27 They do not cut costs by 80 percent, because labor is only one component of the total costs.

28 See Julie Hedlund, "The Rise of the New Mercantilists: Unfair Trade Practices in the Innovation Economy," (Washington, DC: The Information Technology and Innovation and Foundation, 2007).

29 Several telecom companies, including Reliance Infocom and Bharti Telecom, have laid thousands of kilometers of fiber in the past few years, and the state now claims to have the highest density of fiber optic cable in India.

30 Radha Roy Biswas, "Making a Technopolis in Hyderabad, India: The Role of Andhra Pradesh Information Technology Policy," Working Paper (University of Massachusetts-Lowell, Regional Economic and Social Development Department, 2003).

31 This more accurate measure omits computers. Because of the way the Bureau of Economic Analysis accounts for increases in processing power and price declines, computers account for 96 percent of the increase in durable goods output since the early 1990s.

32 Majority-owned foreign affiliates (MOFA) are foreign business enterprises that are owned at least 50 percent by U.S. parent(s).

33 Booz Allen Hamilton and INSEAD, "Innovation: Is Global the Way Forward?" (Booz Allen Hamilton and INSEAD, 2006): 3. <www.boozallen.com/media/file/Innovation_Is_Global_The_Way_Forward_v2.pdf>.

34 See Battelle, "Globalization Alters Traditional R&D Rules," *R&D Magazine* (Sep. 2006): G5. <www.battelle.org/news/06/2006report.pdf>. Also, a recent study of California high-tech firms found that research was in fact the activity most likely to be offshored, with 60 percent of firms reporting that they had offshored R&D compared to just 22 percent that had offshored back office work. Ashok D. Bardhan and Dwight M. Jaffee, "Innovation, R&D and Offshoring," (Berkeley, CA: Fisher Center for Real Estate & Urban Economics, 2005).

35 Robert D. Atkinson, "Deep Competitiveness," *Issues in Science and Technology* (National Academies, Jan. 2007).

36 In 1940, per capita income in the East South Central region was 37 percent of what it was in the Middle Atlantic region. While this differential is smaller than the 10-20 percent differential with India, the South was closer and posed less risk.

37 National Science Foundation, "Global Higher Education in S&E," *Science and Engineering Indicators, 2006* (NSF, 2006). <www.itif.org/files/STEM.pdf>.

38 Robert D. Atkinson et al., "Addressing the STEM Challenge by Expanding Specialty Math and Science High Schools," (Washington, D.C.: The Information Technology and Innovation Foundation, 2007).

39 ACT, "2006 ACT National Score Report News Release," (ACT, 16 Aug. 2006). <www.act.org/news/releases/2006/ndr.html>.

40 Organisation for Economic Co-operation and Development (OECD), "Learning for Tomorrow's World – First Results from PISA 2003," (OECD, 2004).

41 Spellings Commission, "A Test of Leadership: Charting the Future of U.S. Higher Education," (U.S. Department of Education, 2006). <www.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf>.

42 Justin D. Baer, Andrea L. Cook, and Stéphane Baldi, "The Literacy of America's College Students," (American Institutes for Research, Jan. 2006). <www.air.org/news/documents/The%20Literacy%20of%20Americas%20College%20Students_final%20report.pdf>.

43 Robert D. Atkinson, "The Research and Experimenation Tax Credit: A Critical Tool for Boosting Research and Enhancing U.S. Economic Competiveness," (Washington, D.C.: The Information Technology and Innovation Foundation, Sep. 2006).

44 Ibid.

45 R.D. Norton and J. Rees, "The Product Cycle and the Spatial Decentralization of American Manufacturing," *Regional Studies* 13.2 (1979).

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

47 This is done by measuring the overall propensity to export (or patent or invest in R&D) of each industry sector, and multiplying the number of jobs in each sector for each state by that sector's national propensity to export factor. These were summed to create an adjusted total number of jobs for each state. A ratio was calculated comparing the unadjusted to the adjusted. If the ratio was larger than one, the state's industrial mix was slanted toward industries that tend to export less. If it was smaller than one, the state had more jobs than the national average in industries that export more. The total value of exports was multiplied by the ratio for a final adjusted score.

48 To control for the fact that IT workers are heavily employed in IT sectors, such as software, computer and office equipment, and computer related services, which are measured in the High-Tech Jobs indicator, this indicator estimates the number of IT jobs in IT sectors and subtracts this number from the total number of workers in IT occupations in a state. This calculation enables a more accurate picture of the extent to which non-IT industries (e.g., other than software) employ IT professionals.

49 Moreover, this does not account for the fact that improved technology allows the same number of workers today to manage more IT than they could even a few years ago.

50 To count overall state employment, the 2007 *Index* uses Bureau of Economic Analysis employment data, which includes full-time and part-time workers in all sectors, including agriculture and government. A more narrowly defined measure of total employment was used for many indicators in the 2002 *Index*. These have been revised in order to make them comparable, resulting in some small changes in state ranks. It is noted throughout the *Index* where such changes have been made. Still, because industry employment in the 2002 IT Jobs indicator was compiled with SIC classification and the 2007 data is tallied with NAICS, some small differences in industry employment counts between years may exist, rendering the measures from the two years not completely comparable.

51 Managerial and professional jobs were calculated from twenty-five separate Bureau of Labor Statistics Occupational Employment Statistics codes.

52 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

53 Each state's population, aged 25 years or older, was classified by educational attainment. The percentage of residents with some college (at least a year) but no degree were weighted with a multiplier of 0.25. Those possessing associate's degrees were given a weight of 0.5. The multiplier for the percentage of residents with a bachelor's degree was 1.0, and the multiplier for master's and professional degrees was 1.5. Doctorates received a weight of 2.0. The weighted percentages for each state's population were added to find each state's total score. In other words, a state where 15 percent of the residents had some college but no degree (earning a weighted score of 3.75), 10 percent held an associate's degree (a weighted score of 5), 20 percent held a bachelor's degree (a weighted score of 20), 10 percent held a master's or professional degree (a weighted score of 15) and 1 percent held a doctorate (a weighted score of 2), would earn a total score of 45.75.

54 Stuart A. Rosenfeld and Robert D. Atkinson, "Engineering Regional Growth," *Growth Policy in the Age of High Technology*, Jurgen Schmandt and Robert Wilson eds., (Boston: Unwin Hyman, 1990).

55 United States Census Bureau, "Residence One Year Ago by Educational Attainment in the United States," *2005 American Community Survey*. <http://www.census.gov/acs>.

56 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

57 This indicator classifies by years of education each state's residents, aged 25 years or older, who had lived abroad 1 year prior. Because the available data categories for educational attainment of migrants are imprecise, the numbers of years assigned to them in certain cases are estimates. For example, those with less than a high school degree received a value of 9 years. High school degrees earned 12 years, those with some college or an associate's degree earned 14 years, and bachelor's degrees 16 years. Postgraduate degrees were assigned a value of 18.95 years, based on the overall average number of years of schooling of the U.S. population of graduate, professional, and doctorate holders. Each state's final score is the average of its migrants' average years of education.

58 David Hart, "Global Flows of Talent: Benchmarking the United States," (Washington, DC: Information Technology and Innovation Foundation, Nov. 2006). <www.itif.org/files/Hart-GlobalFlowsofTalent.pdf>.

59 Paula E. Stephan and Sharon G. Levin, "Exceptional Contributions to U.S. Science by Foreign-Born and Foreign-Educated," *Population Research and Policy Review* 20:59-79 (2000).

60 Vivek Wadhwa et al., "America's New Immigrant Entrepreneurs," (Durham, NC: Duke University and U.C. Berkeley, January 2007).

61 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 tallied. These were then calculated as a share of the state's total manufacturing employment to obtain each state's final score.

62 Of 88 four and five digit NAICS traded service sectors, 14 IT sectors were removed in order to avoid redundancy, as their employment is measured by the High-Tech Jobs indicator. Among the remaining 74 traded service sectors, 35 pay average wages above the overall median for traded service sector average wages. Employment in these 35 sectors was tallied for each state, and measured as a share of each state's total service sector employment.

63 Early H. Fry, *The North American West in a Global Economy* (Los Angeles, CA: Pacific Council on International Policy, 2000). <www.pacificcouncil.org/pdfs/fry%20report%20final.final.pdf>.

64 *Business Week*, 28 Aug. 2000: 200.

65 Data for exports by state are available for all manufacturing industries, but only four service industries: publishing industries (except Internet); telecommunications; professional, scientific and technical services; and administrative and support and waste management and remediation services.

66 To better measure the propensity of all companies to export, export scores are calculated by controlling for the overall industrial mix in each state. See note 47. Service exports account for only 6 percent of total exports analyzed, due to the limitations in available service export data. For a list of services measured see endnote 65.

67 International Trade Administration, "U.S. International Trade in Goods and Services, 1960-04," *Foreign Trade Highlights;* and Bureau of Economic Analysis, "International Economic Accounts."

68 J. Bradford Jensen, "Business Service Exporters," *Peterson Institute Working Paper* (2007).

69 Because 2002 scores reflect only manufacturing exports, they are not completely comparable. 1999 scores are not adjusted for industrial mix, and so are not included in the comparison.

70 Lawrence R. McNeil, "Foreign Direct Investment in the United States," *Survey of Current Business* (Jun. 2006).

71 Jennifer Koncz, Michael Mann, and Erin Nephew, "U.S. International Services," *Survey of Current Business* (Oct. 2006).

72 In fact, there is virtually no correlation (-.01) between state scores for exports per worker and scores for package exports per worker.

73 The measured period of growth spans from January 1, 2002 to January 1, 2006.

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

75 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

76 To counteract any potential anomalies, the number of business start-ups and failures were measured for two years, 2003 and 2004, and averaged. In past editions of the *Index*, job churning measured business establishments, not firms. However, in this edition SBA firm data are used because they are more recent than the available Census establishment data (2002-2003).

77 U.S. Census Bureau, "Statistics of U.S. Businesses 2002-2003." This is the latest data available.

78 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

79 The numbers from the Fast 500 and the Inc. 500 represent data from both 2005 and 2006 surveys. To qualify for the Fast 500, a company must a) own proprietary intellectual property or technology, b) be incorporated for a minimum of 5 years, and c) have operating revenues in a base year of $50,000 and current year operating revenues exceeding $5 million. To qualify for the Inc. 500, a company must be privately held and in operation for a minimum of 4 years with at least $600,000 in revenues in the base year. The Fast 500 is selected through research and a nomination process and open to firms in North America, while the Inc. 500 list is chosen on an application basis and open only to U.S. firms.

80 The IPO measure is a weighted measure of the sum of the standard deviations for the number of IPOs as a share of worker earnings and the total value of IPOs as a share of worker earnings. Because the number of deals in many states is relatively small, a single large deal can have an enormous impact on the value measure for that year. To mitigate this volatility, combined figures from the three most recent years were used (2004-2006), and greater weight was assigned to the number of deals (a weight of 0.7) than the value (a weight of 0.3).

81 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

82 The *2002 Index* measured IPOs as a percentage of GSP, while the *2007 Index* measures them as a share of worker earnings.

83 Compiled by Robert Fairlie, the "Kauffman State Index of Entrepreneurial Activity," used in this indicator measures the total number of entrepreneurs to start new employer and nonemployer firms in a year, as a share of each state's total adult population. His results for 2004 and 2005 were averaged, and then controlled to account for differing growth rates, because fast growing states offer more opportunities for local-serving entrepreneurial activity than do states without such rapid population and employment growth, and as a result tend to score better. To account for this, the rate of aggregate personal income growth over a four year span was calculated for each state and the standard deviation taken. For every standard deviation above the national average in income growth, a state would see its *Index* score reduced by 10 percent. The opposite was true for states below the national average in income growth. For example, a state with an average entrepreneurial index score of 0.30%, but with an income growth rate 0.5 standard deviations below the national average, would receive an adjusted score of 0.315%.

84 Erkko Autio, op cit. See note 74.

85 Population for this indicator is the number of people of workforce age, which is considered to be those between ages 18 and 64. Patents counted here are also counted in the Patents indicator, which measures the total number of patents. In the overall state scores, the relative weight of the Inventor Patents indicator has been reduced accordingly. To counteract any volatility in patent counts, the numbers represent an average over two years (2004-2005).

86 Atkinson and McKay, op cit. (2007): 29. See note 5.

87 eMarketer, op cit. See note 26.

88 Indeed, economists estimate that all of the increases in productivity growth rates of the last decade were a result of the IT revolution. See Atkinson and McKay, op. cit. (2007). See note 5.

89 Thomas Hubbard, "Information, Decisions, and Productivity: On-board Computers and Capacity Utilization in Trucking," *The American Economic Review* 93 (2003): 1328.

90 Pew Internet & American Life Project, "Internet Adoption: Usage Over Time," (2006). <www.pewinternet.org/trends.asp#adoption>. Those "online" use the Internet at least occassionally.

91 Pew Internet & American Life Project, "Generations Online," (Jan. 2006). <www.pewinternet.org>.

92 State scores for online population are correlated with workforce education (0.64) and per capita income levels (0.52).

93 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

94 Of the total number of registered .com, .net, and .org domain names measured, approximately 80 percent are commercial (.com), and this proportion is relatively consistent across states. It should also be noted that the number of commercial domains registered in a state is not an exact measure of the number of businesses with Web sites, for a number of reasons. First, not all registered domains are actually in use. (Sometimes organizations register names they think they might use. And some domain names are held by speculators hoping to sell them.) Secondly, many domain names are registered by individuals for non-commercial purposes, to create personal Web pages, fan sites, and the like. And of the domains registered to businesses, not all of them are for commercial purposes, per se. (Some companies create rudimentary Web pages simply to make sure they are visible, as they might place an ad in the Yellow Pages. Others invest hundreds of thousands or millions of dollars building elaborate e-commerce systems in order to sell to markets around the world.) Nonetheless, these factors will be true across all states, and thus should cancel each other out.

95 Matthew Zook, University of Kentucky.

96 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

97 Measures used in this indicator were students per instructional computer (2005), students per high-speed Internet-connected computer (2005), and students per Internet-connected computer in the classroom (2004). These received weights of 0.2, 0.5, and 0.3., respectively.

98 Cathy Ringstaff and Loretta Kelley, *The Learning Return on Our Educational Technology Investment* (San Francisco, CA: WestEd, 2002). <www.WestEd.org/online_pubs/learning_return.pdf>.

99 *Education Week*, "Technology Counts 2006: The Information Edge," (May 2006). <www.edweek.org>.

100 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

101 To calculate the final scores for this indicator, the standard deviation scores of each study's final scores were combined and then divided by two. *Digital State* scores were provided by Paul Taylor at the Center for Digital Government. Because *Digital State 2006* scores for 6 states were not available (Alaska, Florida, Indiana, New Jersey, New Mexico, and West Virginia), their *Digital State 2004* scores were used, after adjustment by the average percent change in score from 2004 to 2006. Scores for Alaska and New Mexico represent average scores between 1999-2004, after adjustment. It should also be noted that, as expected, the two studies that constitute the Digital Government indicator are highly correlated.

102 Robert D. Atkinson, "Turbo Government: A Bold New Vision for E-government," (Washington, DC: The Information Technology and Innovation and Foundation, Jun. 2006). <www.itif.org/files/turbogov.pdfwww.itif.org>.

103 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

104 The standard deviations of the two percentages were combined for each state's final score. Because data is not available for Alaska and Hawaii, they have been assigned scores equivalent to the national median.

105 U.S. Department of Agriculture, "Farm Computer Usage and Ownership," (2005). <usda.mannlib.cornell.edu/usda/current/FarmComp/FarmComp-08-12-2005.pdf>.

106 In several cases, USDA reports farm computer and Internet usage for multiple states with a single overall average score. This is the case for Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

107 The number of residential broadband lines per household received a weight of 1.0, while the number of business broadband lines per business establishment received a weight of 2.0. The standard deviations of the two measures were combined for the final score. Because data is not available for Hawaii, it has been assigned a score equivalent to the national median. Further, the data used are from June 2005, because the most recent (December 2005) available data from the FCC appear to contain several significant inaccuracies.

108 Federal Communications Commission, "High-Speed Services for Internet Access: Status as of December 31, 2005," (Jul. 2006).

109 John Horrigan, "Home Broadband Adoption 2006," *Pew Internet & American Life Project* (May 2006). <www.pewinternet.org/pdfs/PIP_Broadband_trends2006.pdf>.

110 Because the methodology used in the *2007 Index* differs from that of the *2002 Index*, the 2002 ranks have been recalculated using the same methodology and weighting. However, since the *2002 Index* was published, the FCC has changed the way it reports the number of broadband lines. Before 2005, broadband lines were divided into a) residential and small business, and b) other (including all other businesses). Since 2005, small business lines have been classified with other business lines. Because our analysis involves different weighting for the 2 categories, the fact that the categories have changed means that the ranks are not totally comparable between 2002 and 2007. Further, Alaska's low rank in 2002 is likely the result of inaccurate 2000 FCC data.

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114 AeA, *Cyberstates 2006* (Washington, DC: 2006), and Atkinson and McKay, op cit. (2007). See note 5.

115 Because the methodology used in 1999 differs slightly from that in 2002 and 2007, the rankings are not totally comparable and comparisons have not been calculated.

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117 Scientists and engineers include only those who have attained a doctorate in their field. They are measured as a share of each state's total workforce.

118 2003 NSF data is the most recent available for scientists and engineers in the workforce.

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About The Authors

Dr. Robert D. Atkinson is President of the Information Technology and Innovation Foundation. As former director of the Progressive Policy Institute's Technology and New Economy Project, executive director of the Rhode Island Economic Policy Council, and project director of the Congressional Office of Technology Assessment, he has conducted groundbreaking technology policy research, advised policy makers, and written and spoken extensively on technology issues. He is the author of *The Past and Future of America's Economy: Long Waves of Innovation That Power Cycles of Growth* (Edward Elgar: 2005).

Daniel K. Correa is a research assistant at the Information Technology and Innovation Foundation, and a graduate of Dartmouth College.

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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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Information Technology and Innovation Foundation, 1250 I Street, NW · Suite 200 · Washington, DC 20005
email: mail@itif.org · Telephone 202-449-1351