• NATIONAL GOVERNORS ASSOCIATION CHAIR'S INITIATIVE •

GROWING STATE ECONOMIES

A POLICY FRAMEWORK

National Governors Association

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EXECUTIVE SUMMARY

The recent national recession has pushed job creation to the top of every governor's policy agenda. What can be done to create more high-wage jobs in our state economies? The short answer is this: focus on businesses that are growing the fastest.

Taxes and regulations at the federal, state and local governments have a significant impact on business creation and development. The initial decision by a business about where to locate and the rate at which they grow is affected by economic, tax and regulatory policies.

Many owners of startups and small businesses reported during meetings held as part of the National Governors Association Chair's Initiative *Growing State Economies* that fulfilling initial filing and permitting requirements can be a daunting and sometimes insurmountable task. Even after a new business becomes a going concern, the burden of regulation affects growth and employment. Reducing and streamlining the regulatory process is especially helpful for startups and small businesses.

Similarly, the structure of each state's tax system and overall tax burdens affect the creation and growth of business. High state taxes can reduce a state's economic growth. Improving the quality of a state's educational system can have a positive impact on economic growth.

Each state must decide on its tax, spending and regulatory policies. Within that framework, however, this report highlights six issues and activities that can be refined to improve the conditions for job creation. The six drivers of growth are:

- **Entrepreneurs,** the individuals who seed, grow and renew businesses;
- **Education and skills,** the concentration of highly educated, highly skilled individuals within economies;
- **Innovation and technology,** the new ideas and technologies that enter the economy and change what is produced, how it is produced and the way production itself is organized;
- **Private capital,** the sufficiency and availability of debt and equity financing at all stages of company formation;
- **Global markets and linkages,** the businesses competing successfully in global markets; and
- **Industry clusters,** the firms embedded in regional clusters supported by institutions providing education, training, finance and marketing services, which experience higher rates of job and wage growth than comparable firms not embedded in such clusters.

The challenge for state policymakers is to strategically combine the factors that support and sustain the businesses that have propelled growth into a policy agenda.

The central theme of this report is that, together, these six factors demonstrate the road for United States businesses to compete in the 21st century and frame the terms within which states can help businesses move down that road. Although businesses must make the decisions and take actions to grow and compete, the conditions that make it possible can be directly influenced by the actions of policymakers at all levels of government. State policies can assert a positive influence in each of the six areas and be most effective when they take advantage of the complementarities among them. For example, entrepreneurship brings innovation to markets, which increases productivity and leads to both growth and high-wage jobs.

"The Iron Law of the Modern Economy": Leadership in Productivity Growth

Productivity drives both prosperity and economic growth. Productivity growth (output per worker) is the basis for rising real wages for workers, increasing returns to shareholders, and increasing per capita income for a state and the nation.

Businesses and workers without high levels of productivity and who do not continually work to improve themselves find it increasingly difficult to thrive and compete. The models that economists use to examine economic growth describe the relationship between outputs of goods and services; inputs of people's time and effort; and factories and offices in which they work, including all equipment necessary to do their jobs. More can be produced when more workers or capital—factories, equipment, and the like—are added to the mix.

Innovation also is important to productivity growth. The value of goods and services increases not only as more workers are employed and as investors create more capital, but also because of new technologies and innovation in products, processes, and management. Increasingly, it is innovation-driven productivity growth that is the basis for rising real wages for workers, increasing returns to shareholders, and increasing per capita income for a state and the nation.

The key to state economic growth, then, is to have as many innovative, productive, and globally competitive businesses and workers as possible reside within a state's borders. As Michael Porter said in a speech before the National Governors Association: "Productivity determines wages. Productivity sets jobs. Productivity determines the standard of living. This is the iron law of the modern global economy. The more we're open to the rest of the world, the more businesses can invest anywhere; it's productivity that determines whether your particular state is going to succeed." (Porter, 2011).

A Policy Framework

If productivity is the key, particularly that generated by innovation, what role does public policy play in fostering it? This report highlights the following six factors and considers how state policies can influence progress in each area:

- **Entrepreneurs,** the individuals who seed, grow, and renew businesses;
- **Education and skills,** the concentration of highly educated, highly skilled individuals within economies;
- **Innovation and technology,** the new ideas and technologies that enter the economy and change what is produced, how it is produced, and the way production itself is organized;
- **Private capital,** the sufficiency and availability of debt and equity financing at all stages of company formation;
- **Global markets and linkages,** the businesses competing successfully in global markets; and
- **Industry clusters,** the firms embedded in regional clusters supported by institutions providing education, training, finance, and marketing services, which experience higher rates of job and wage growth than comparable firms not embedded in such clusters.

The central theme of this report is that, together, the six factors demonstrate the roadmap for U.S. businesses to compete in the 21st century (see text box).

It also frames the terms within which states can help businesses move down that road. Although businesses must make the decisions and take actions to grow and compete, the conditions that make it possible can be directly influenced by the actions of policymakers at all levels of government. State policies can assert a positive influence in each of the six areas and be most effective when they take advantage of the complementarities among them. For example, entrepreneurship brings innovation to markets, which increases productivity and leads to both growth and high-wage jobs.

The report describes each of these six factors in detail:

- It defines the components of each factor;
- It describes the theoretical reasons why the factor matters; and
- It marshals evidence showing how the factor influences state economic success.

The report also provides ideas on how state policies can influence progress in each area and emphasizes that, used together, these six factors can serve as an effective framework—or policy map—for growing state economies.

WHAT IS COMPETITIVENESS?

"Competitiveness" is a phrase with many varying meanings. Having the correct definition and strategy is increasingly important, Michael Porter and Jan Rivkin argue in the March 2012 Harvard Business Review. They provide this guidance for policymakers and corporate managers:

The United States is a competitive location to the extent that companies operating in the U.S. are able to compete successfully in the global economy while supporting high and rising living standards for the average American. A competitive location produces prosperity for both companies and citizens.

Whether a nation is competitive hinges [instead] on its long-run productivity—that is, the value of goods and services produced per unit of human, capital, and natural resources. Only by improving their ability to transform inputs into valuable products and services can companies in a country prosper while supporting rising wages for citizens. Increasing productivity over the long run should be the central goal of economic policy. This requires a business environment that supports continual innovation in products, processes, and management.

PRODUCTIVITY IS THE KEY TO GROWING STATE ECONOMIES

What is the Evidence?

- ***Productivity is a key driver of long-term economic growth.*** One study estimates that rising productivity accounted for about 80 percent of recent gross domestic product (GDP) growth (Malhotra & Manyika, 2011). Becoming steadily more productive enables American workers to compete effectively with those in other countries. And higher productivity levels enable these workers to keep their jobs, even in the face of lower wage competition (because higher productivity helps offset the competitive disadvantage of higher wages).

- ***Productivity is highly correlated with incomes at the state level.*** States with higher levels of average productivity, as measured by output per capita, generally have higher levels of per capita income (Figure 1). Harvard economist, Elhanan Helpman notes in his book, *The Mystery of Economic Growth (2010),* that differences in productivity explains significant cross-country variations in per capita income. He cites that differences in productivity accounts for 90 percent of the variation in cross-country differences in the growth rate of income per worker.

- ***American workers are now more than twice as productive, on average, as they were four decades ago.*** In 1967, the average American worker produced about $29 in output per hour worked (valued in 2010 dollars). By 2010, aver-

Who Says?

MIT economist Robert Solow won the Nobel Prize in Economics in 1987 for his work on the role of productivity and economic growth. He developed a series of measures to track the contributions of workers, capital investment, and technology to improving productivity. Solow's work shows that our long-term gains in income and living standards can be traced directly to improving productivity.

FIGURE 1. Productivity Strongly Correlated with Per Capita Income

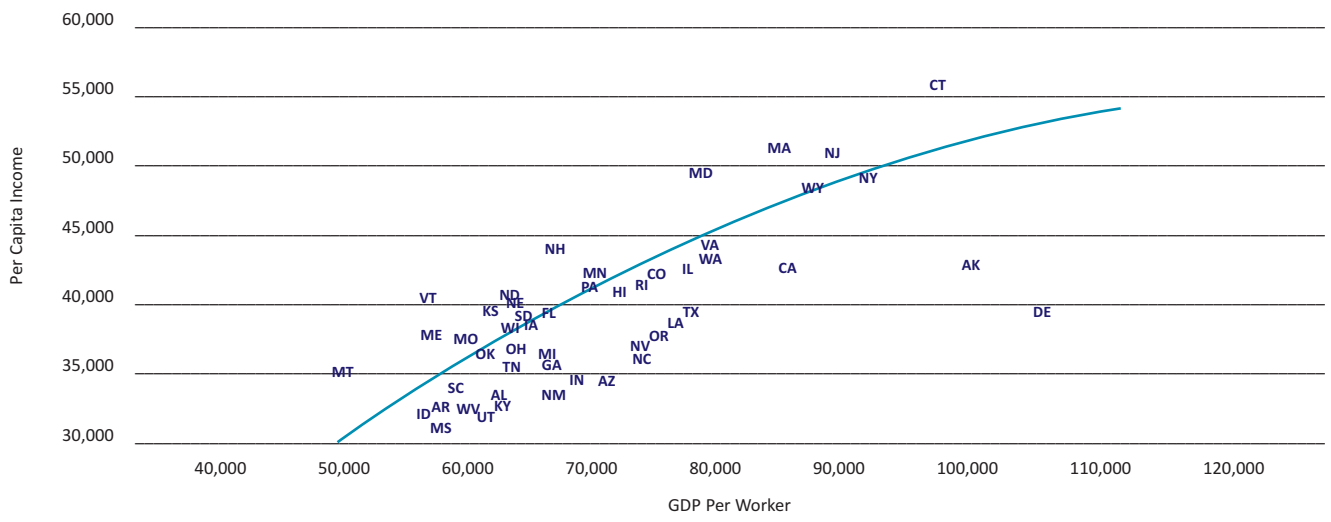
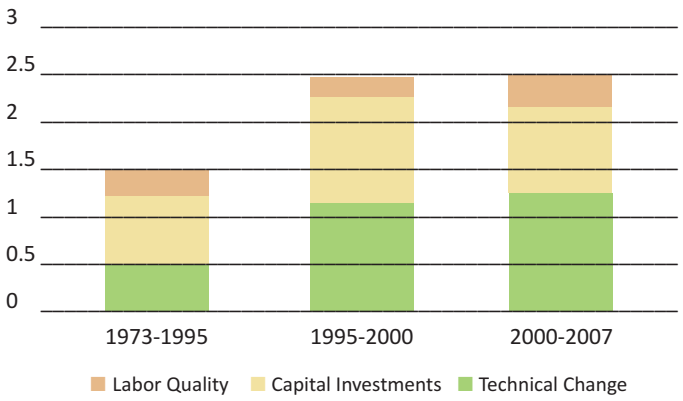


FIGURE 2. Breaking Down Productivity Changes
(change in output per hour)



Source: Gordon, 2010

age output in the United States had doubled to $61 per hour worked (The Conference Board, 2011). Those improvements in productivity enabled higher worker incomes and increased household purchasing power.

- ***The basis for productivity growth is increasingly innovation.*** As figure 2 shows, economic growth in the United States was held back by weak productivity growth in the 1970s and 1980s. With the advent of information and communication technology in the 1990s, United States labor productivity grew much more rapidly (Gordon, 2010).

What Have We Learned Recently?

- ***There are still ample opportunities to improve productivity simply by better aligning lower performing firms and industries with best practices.*** There is obviously wide variation in productivity across different industries and among firms within those industries. Over time, productivity grows for a variety of reasons—more productive firms grow faster, raising average productivity; inefficient firms go out of business; and businesses learn or imitate the "best practices" in their industries. Estimates by McKinsey and Company show that a significant portion of needed U.S. economic growth can be propelled by more widely applying established best practices across the economy (Malhotra & Manyika, 2011).

- ***It is particularly important to focus on improvements in the productivity of the service sector of the economy.*** Although much of the focus is on productivity in manufacturing, it is even more important to focus on productivity improvements in service industries—services are about three to four times larger than manufacturing as a share of the U.S. economy. The Mckinsey Global Institute (2011) points out that public and regulated sectors such as health care and education can benefit from productivity improvements.

The Role of Entrepreneurs

Most new jobs occur when entrepreneurs start companies. Some open businesses to employ themselves. Some start small businesses that fill a niche and never grow beyond it. Others launch firms with the intent of significantly growing their companies—and succeed at it. All of those models are important. But it is important to distinguish among types of entrepreneurs, because some have more impact than others. Entrepreneurs who build high-growth ventures are a particularly important source of job growth.

High-growth entrepreneurs usually pursue the commercialization of a radically innovative idea—a new process, product, or service—that can wind up transforming entire global markets. Fred Smith devised the idea of overnight package delivery and built the global giant Federal Express, which revolutionized logistics. Steve Jobs and Bill Gates founded Apple and Microsoft, two companies that have defined the idea of personal computing and have touched almost everyone's lives. In addition to those well-known examples, there are entrepreneurs in almost every state who have created new businesses, which play important roles nationally and internationally.

What is the Evidence?

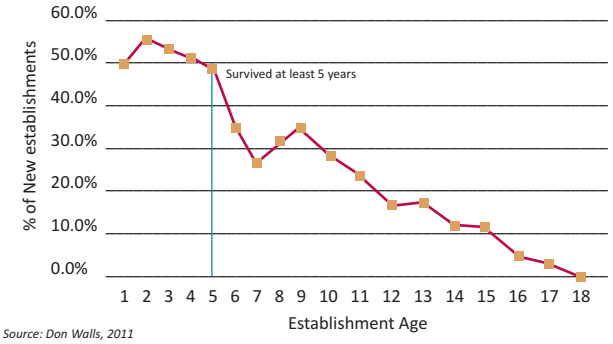
Firms younger than five years create most of the new jobs each year. Even though small firms are often described as the engines of job growth, the more accurate view is that new, small firms—frequently referred to as startups—are a particularly important source of job growth. (Congressional Budget Office, 2012). Evidence of the greater job-creation rates associated with new, small firms includes a Kauffman Foundation study, which found that job creation by *very small firms* (those with fewer than 20 employees) and newly formed firms (established within the past five years) account for a majority of overall job creation in any given year (Stangler, 2010).

As important as startups are, some of the greatest returns to the economy come from those businesses that survive the dynamics of startup and advance to subsequent stages of growth. New ventures have relatively volatile growth paths, leading them to both create and eliminate jobs at higher rates than larger firms. By one analysis, nearly 40 percent of new startup firms shut down within the first three years (Spletzer, 2000). Another study, based on recent data released by the U.S. Census Bureau's Business Dynamics Statistics (BDS), reiterates that firms aged one to five years generate approximately 43 percent of new jobs; it also finds that many of these young firms experience employment loss due to closure (nearly 20 percent job destruction) in their first year (Haltiwanger, Jarmin, & Miranda, 2010).

As figures 3 and 4 show, surviving the first 5 years is a key indicator of business longevity and underscores that some of the greatest job creation can come from expansions of existing (surviving) firms. Firms surviving the 5-year mark may not grow beyond their initial startup employment size, however (Reedy & Litan, 2011).

FIGURE 3. Failure Rate by Business Age

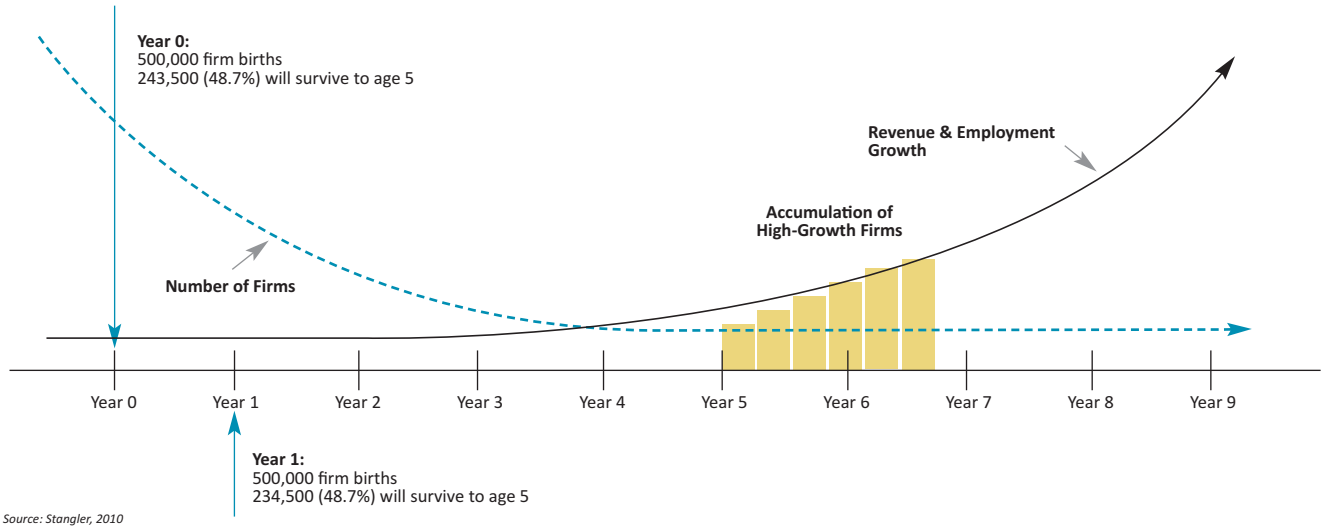
Surviving the first 5 years is a key indicator of business longevity



Source: Don Walls, 2011

A relatively small group of high-growth firms are particularly important. A study of high-impact firms by the U.S. Small Business Administration shows that relatively few high-growth firms account for a disproportionate share of job creation in almost every state (Acs, Parsons, & Tracy, 2008). The study defines high-growth firms as those that expand employment by 15 percent or more annually for five consecutive years. High-growth firms can be any age; it is not necessarily the case that those firms are always newly formed. Nationally, such firms make up approximately 5 percent to 6 percent of all of the businesses, but virtually all of net new job creation. There are high-impact firms in every state.

FIGURE 4. The Accumulation of High-Growth



Source: Stangler, 2010

Who Says?

More than 70 years ago, Harvard economist Joseph A. Schumpeter famously coined the term "creative destruction," a somewhat self-contradictory shorthand for how capitalist systems constantly replace existing ways of doing business with new ones and for emphasizing the critical role that entrepreneurs play in economic progress (Schumpeter, 1934). In his view, economic advances don't happen by the smooth transition of existing firms or industries into new ones, but by the creation of entirely new businesses and business models that move the economy to a new level of productivity and living standard.

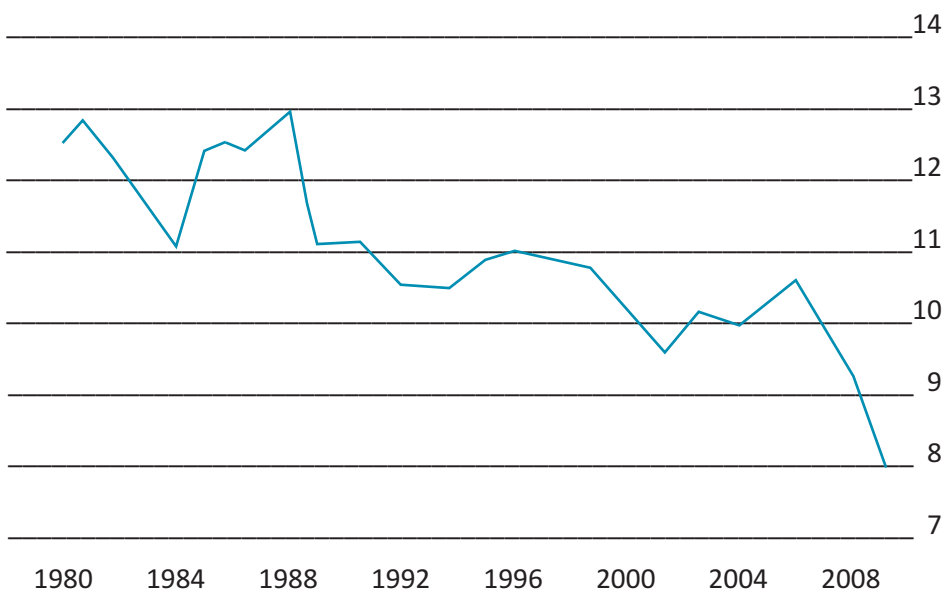
Immigrants play a key role in fueling technology firms. America's traditional openness to immigrants has contributed substantially to entrepreneurial activity. One study found that a quarter of the new computer and information technology firms formed between 1995 and 2005 had one or more immigrants among their founders. By 2006, these firms included more than 450,000 employees and reported more than $50 billion in revenue (Wadhwa, Jasso, Rissing, Gereffi, & Freeman, 2007).

Business relocations typically play a minor role in contributing to state job growth. In fact, relatively few businesses ever move outside the area in which they are established. Over a three-year period, approximately three-tenths of 1 percent of U.S. businesses made an interstate move; many of these were to locations in adjacent states within a single metropolitan area (Brandow, 1999). In Silicon Valley—a region of famously high costs and the frequent target of industrial recruiters promoting lower cost alternative locations—relatively few businesses move away. Over a 10-year period, fewer than 3 percent of all of Silicon Valley's high-tech establishments relocated outside of the region, and of these, less than a third left the state of California (Zhang, 2003).

What Have We Learned Recently?

The U.S. entrepreneurial engine is showing serious signs of weakness. Considerably fewer new businesses are formed today than in the past, creating fewer new jobs. A 2012 U.S. Department of Commerce study shows that the business formation rate has been trending down since 1980 and fell at a particularly sharp rate during the most recent recession (Figure 5). Another analysis by the Kauffman Foundation shows that job creation in startups has fallen from an average of 3.5 percent of total U.S. jobs annually in the 1980s to 2.6 percent of total U.S. jobs in the 2000s (Reedy & Litan, 2011).

FIGURE 5. U.S. Private Business Startup Rate, 1980–2009



Source: U.S. Census Bureau, Center for Economic Studies, Business Dynamics

The attention in the popular media is often focused on layoffs at existing firms. Yet a remarkable slowdown in the number of new businesses being started, and the consequent decrease in new jobs being created, has been an important factor in the sluggish recovery the United States has experienced in the past few years.

DESIGNING POLICIES TO FACILITATE ENTREPRENEURIAL ACTIVITIES

Policy Questions and Direction

The following questions and points provide some basic guidelines for a policy agenda:

- ***Does your state devote most of its attention and resources to growing its own entrepreneurs?*** Or, are most of the attention and resources devoted to recruiting firms from elsewhere?
- ***Define entrepreneurship clearly, and distinguish its various forms in contrast to related subjects like innovation or the economic role of small businesses.*** Efforts are likely to have a much greater impact by focusing on high-impact models and by linking efforts to your state's existing and emerging industry cluster strengths (Monitor Group, 2009).
- ***Make sure state policies and efforts make use of the insights gained directly from entrepreneurs and those who work with them.*** Some of the most frequently recommended policy measures significantly contradict what entrepreneurs say they need and what they fail to get as it relates to the critical factors that matter most at different stages of growth. Working with high-growth entrepreneurs is different than working with startups. For example, during the startup phase, entrepreneurs strive to develop products and find initial customers. Second-stagers struggle with new issues, such as strategic planning, market diversification, and operational efficiencies.
- ***Are your initiatives coordinated to take advantage of complementarities between policies?*** For example, since entrepreneurial activity is correlated with commercialization of research and development, providing the right policy measures—tax incentives, credits for commercialization, and smooth pathways for entrepreneurs to connect with university researchers and venture capitalists—are likely to have a much greater impact if pursued in a coordinated plan.
- ***Is it easy or difficult to file the necessary paperwork and obtain licenses and permits to start and operate a business in your state?*** Making sure that regulatory and administrative requirements that each new firm must comply with are transparent, simple, and meet straightforward tests for good customer service is basic public policy that supports entrepreneurship.

> Economic change is a ubiquitous, ongoing, incremental process that is a consequence of the choices individual actors and entrepreneurs of organizations are making every day *(North, 1993)*.

The Role of Education and Skills

Education and skills are increasingly important to economic success. For individuals, the correlation between an individual's education, lifetime earnings, and probability of avoiding unemployment has grown stronger over time. What is true for individuals also holds for states. States that have higher average levels of education tend to have greater levels of economic success. Education and skills are central to nearly every issue of economic growth today: rising levels of productivity, innovation, entrepreneurship and prosperity.

Specialized education and skills are especially vital. It is individuals with specific training, abilities and characteristics—for example, scientists, engineers, entrepreneurs, and managers—who provide the principal mechanisms through which economies evolve and thrive. A critical mass of high-powered minds and specialized knowledge is in great demand, not just in the United States but around the world, as corporations look for new sites for a particular cutting-edge industry and young scientists and engineers want to be where other highly-skilled people are. Like attracts like, and that magnetism has greatly accelerated in recent years.

What is the Evidence?

Education and skills are important to improving productivity. A greater level of education results in higher labor productivity (Goldin & Katz, 2008). For example, one study finds that higher educational attainment has led to improvements in the quality of the labor force that have added between one-quarter of 1 percent to one-third of 1 percent to overall productivity growth rates annually over the past two decades (Gordon, 2010).

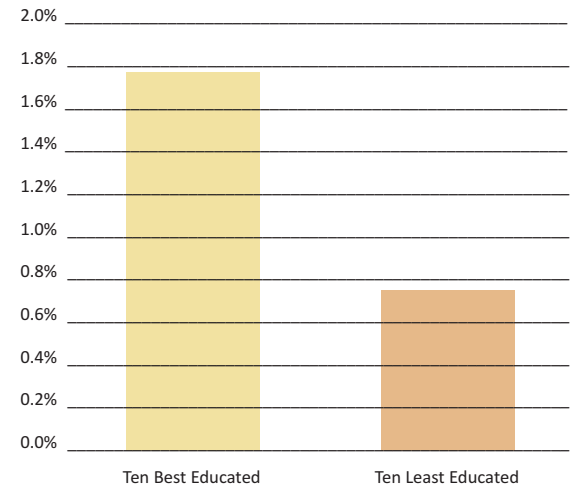
States with better educated populations have significantly higher per capita incomes. Figure 6 shows the correlation between the fraction of the adult population with a four-year degree or higher level of education and the per capita income in each of the 50 states in 2010.

Moreover, places with higher levels of education have faster rates of income growth. Better educated metropolitan areas showed substantially higher incomes and faster income growth than the least well-educated metropolitan areas (Figure 7: Gottlieb & Fogarty, 2003). Education seems to bring higher returns to places, not just to the particular individuals who possess those skills. Economist Enrico Moretti, for example, found that a 1 percent point increase in the college-educated population of a metropolitan area raises everybody else's average wages by 0.6 to 1.2 percent (Moretti, 2004).

Who Says?

Gary Becker, the Nobel Prize–winning economist from the University of Chicago, coined the term "human capital" to describe the importance of education and skills to economic performance (Becker, 1964). Since he published a book under that title in 1964, economists have focused on the connection between educational attainment and economic success.

FIGURE 7. Better Educated Metropolitan Areas Have Faster Rates of Income Growth



Source: Gottlieb & Fogarty, 2003

Entrepreneurs tend to be highly educated. Highly educated persons are disproportionately likely to start successful high-growth firms and to develop new ideas that are economically valuable (See Figure 8).

Science and technology firms are even more likely to be started by well-educated founders. As figure 9 shows, ninety-two percent of U.S.-born technology and engineering firm founders had at least a bachelor's degree and 48 percent had a master's or higher degree (Wadhwa, Freeman, & Rissing, 2008).

FIGURE 6. Per Capita Income Strongly Correlated with Education Levels

Annual Per Capita Income, 2010

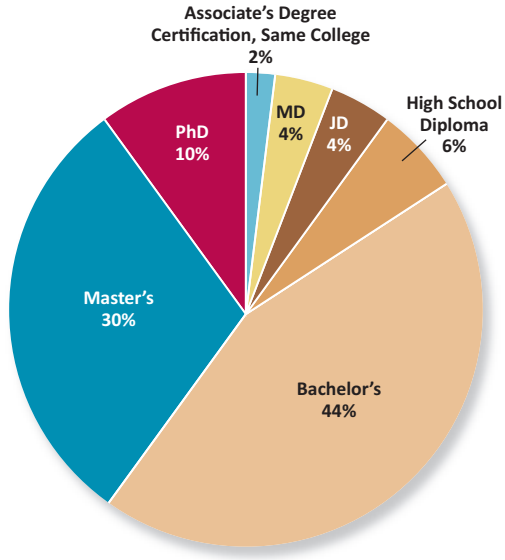
Sources: BEA (income), Census (education)

FIGURE 8. Entrepreneurship by Age and Education

United States

Source: Survey of Business Owners, U.S. Census Bureau; Analysis Collaborative Economies

FIGURE 9. Terminal Degree Completed by U.S.-Born Tech Founders



Source: Wadhwa, Feeman, and Rissing, 2008

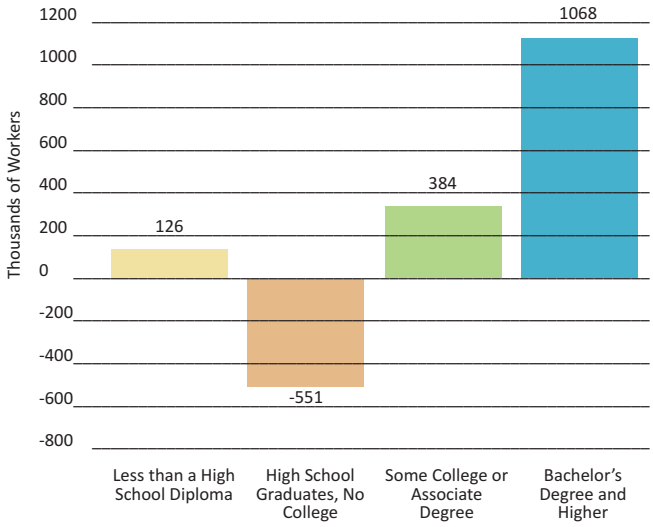
What Have We Learned Recently?

Returns from education have continued to increase. The data suggest that the trends building for more than half a century are continuing to play out. The most recent data show higher than ever returns on investment for a college education: a person holding a four-year college degree now earns 84 percent more than a person with just a high school diploma (Carnevale, Rose, & Cheah, 2011).

Places with more educated populations have fared better in the face of the recent national recession. In 2010, areas with residents possessing an above-average education had lower unemployment rates, not only for those with a college education, but also for those with lower levels of education (Glaeser, 2010).

Job losses continue to grow for the less educated, even in the recovery. Over the past year, the number of jobs for those with a high school diploma or less education has been declining, and all of the net increase in jobs has been for people with at least some college education (Figure 10). The greatest job growth has been for those with a college degree (Rampell, 2012).

FIGURE 10. Change in Number of Employed Workers Age 25+, from Dec. 2010 to Dec. 2011, by Education (seasonally adjusted)



Source: Rampall, 2012

DESIGNING POLICIES TO BOOST EDUCATION AND SKILLS

Policy Questions and Directions

The data provide important insights into policy actions in several areas:

What are you doing to increase college attainment in the state?

- ***What state policies are in place to encourage students to complete a degree or certificate, particularly students from groups historically at greater risk of not completing degrees?*** Review the state's financial aid program and institutional funding mechanisms to determine if there are incentives for completion.
- ***Are public postsecondary institutions producing enough degrees in high-growth fields to meet the state's current and future demand?*** Establish goals for increasing college attainment in the state (if they do not already exist) and link the goals to current/projected workforce needs.

What are you doing to provide the education and training to prepare the next generation of entrepreneurs and would-be business owners?

- ***How can state education efforts encourage students to think about inventing their first jobs, not applying for them?*** Education is not simply about training workers for existing businesses. It is about getting students ready to start companies and become chief executive officers of their own businesses.
- ***Is the state's education system fully engaged with your industry clusters?*** Every state has its own distinctive industry sectors (see the discussion of clusters, later). A key opportunity for strengthening your economy is making sure that there are good connections among leading industry clusters, particularly in defining educational needs, assuring that curricula are timely and relevant, and providing workers with training and retraining to manage the very real challenges of technological change and global competition.
- ***A state's immigrant population is likely to make a disproportionately large contribution to entrepreneurial activity.*** Do relevant programs recognize this opportunity?

> The enormously tight connection between skills and unemployment should remind us of the importance of investing in human capital. Skills drive the success of individuals, cities, and nations. America's future rests on the human capital of its population *(Glaeser, 2009)*.

The Role of Innovation and Technology

Innovation has always been a key driver of economic success. Its importance has even grown in recent years, as those who create and apply new knowledge capture more and more of the value generated in the economy. As the economy has globalized and entrepreneurs from anywhere are eager to figure out how to replicate techniques and technologies at lower costs and even at faster speeds, the real challenge is increasingly that of continuous innovation. Today, it is important that everyone at every level of a company is enlisted as a potential innovator, that economic and social ecosystems support creativity and adaptability, that there is rapid knowledge transfer, and that more places experience the founding and growth of new firms.

Although the focus is often on major scientific breakthroughs and technology fields—which are critical types of innovation—innovation actually takes many forms, from better ways to sew a shirt, to improved customer service, to the use of information technology to improve inventory management. Businesses across all sectors that do not change, that stand still, find that they face increasing competition. As Michael Porter told the nation's governors in 2011, "If a company in your state is doing the same thing that it did 10 years ago—using the same production processes, producing the same products—it's going to be very hard to succeed" (Porter, 2011).

What is the Evidence?

Innovation is by far the most important factor in economic growth. As mentioned earlier, MIT economist Robert Solow won his Nobel Prize for showing that in the United States technological innovation was the most important "factor of production." Subsequent studies of the U.S. economy during the 1990s concluded that technological change and innovation (especially in the areas of information technology, supply-chain management, and robotics) accounted for the largest share of U.S. productivity gains over the period (Mckinsey & Company, 2001).

Innovation is strongly correlated with business success and local economic vitality. Cross-country, country-level, and company-level studies show that innovation, as measured by research and development or patenting, has a positive association with economic productivity and enhances market share and profitability at the company level (Atun, Harvey, & Wild, 2006). Differences in innovative activity, along with education attainment, also account for much of the income differentials between cities and states.

The benefits of innovation tend to be regional. Innovation tends to be clustered in particular places, and knowledge spills over from research institutions to and among firms. Put another way, innovation activity is seldom confined to a single company or research institution. And because knowledge spillovers are fundamentally a phenomenon of human interaction, they are also strongly local in character. This is especially true in recently created knowledge, where the knowledge is embodied in the intellectual capital of the discovering scientist, for example, and only can be transferred to other parties through active working relationships with the scientist. Companies tend to locate R&D centers near research universities because of the talent and knowledge pools that are locally available (National Academy of Sciences, 2010).

Who Says?

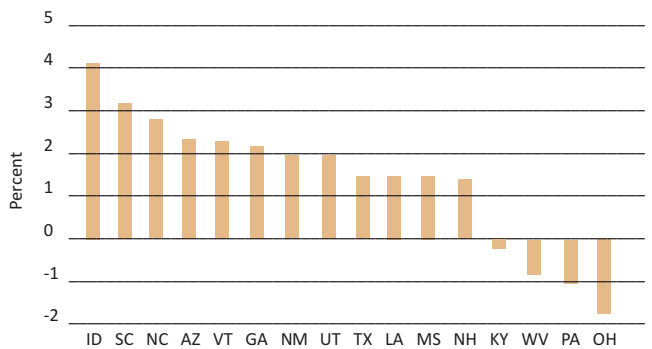
The insight that companies innovate for growth has led economists to retool their theories of what drives long-term economic expansion. For decades, economic theorists followed the work of Nobel Laureate Robert Solow, who developed the means for attributing increases in the growth of economic activity to a combination of improvements in physical capital and human capital (Solow, 1957). But those calculations showed that a significant amount of growth came not from either of these sources, but from a residual, which economists attributed to steady improvements in technology.

In the 1980s, several economists, led by Paul Romer, formulated the New Growth Theory, which attributed growth to the economy's ability to create and deploy new ideas (Romer, 1986). The critical implication of this theory is that national economic success is determined by how successful a nation's economic system is in creating incentives and rewards for creating new ideas. The critical role of institutions—the kinds of organizations and rules that we create to guide economic activity, and especially knowledge creation—was also a central part of the work that earned Douglass North the economics Nobel award (North, 1990).

What Have We Learned Recently?

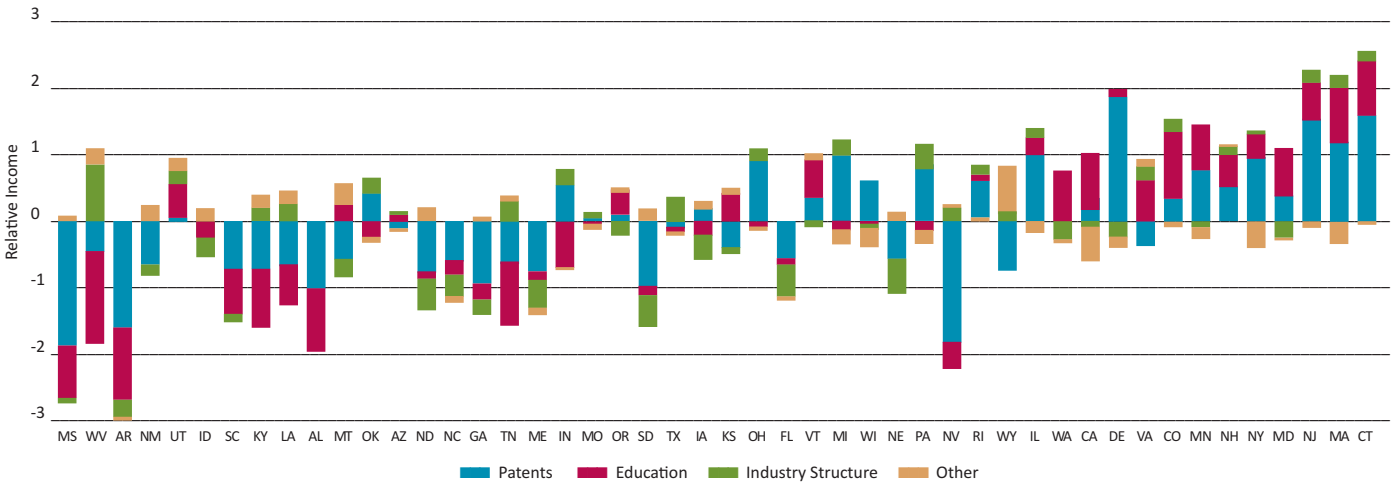
Increased innovation, as evidenced by patents issued, is positively correlated with higher state per capita income. Research continues to confirm that differences in the stock of knowledge among states play a key role in shaping economic performance (see Figures 11 and 12). A study prepared for the Federal Reserve Bank of Cleveland found that a state's stock of patents had a measureable impact on per capita income, after controlling for the effects of differences in tax burdens, public infrastructure, size of private financial markets, rates of business failure, industry structure, and climate (Bauer, Schweitzer, & Shane, 2011).

FIGURE 11. Change in Estimated Effects of Patents on Income, 1989–2004
(seasonally adjusted)



Source: Bauer, Schweitzer, & Shane, 2011

FIGURE 12. A State's Stock of Knowledge is the Main Factor Explaining its Relative Level of Personal Income (Cumulative Effects of Explanatory Variables)



Source: Bauer, Schweitzer, & Shane, 2011

The ability to innovate in fast-growing fields and to be able to deploy research locally has the greatest economic impact. The states that had the greatest return from innovation were not necessarily those with the largest stock of patents, but those that grew their patent activity the most, especially in fast-growing technologies like semiconductors and information technology (Mukherji & Silberman, 2011).

> As the world becomes more and more closely integrated, the feature that will increasingly differentiate one geographic area (city or country) from another will be the quality of public institutions. The most successful areas will be the ones with the most competent and effective mechanisms for supporting collective interests, especially in the production of new ideas *(Romer, 1992)*.

DESIGNING POLICIES TO BOOST INNOVATION

Policy Questions and Directions

The importance of innovation for growth calls on states to strengthen the innovation capabilities and processes within their boundaries. Considerations for designing policies to meet that challenge include the following:

- ***Does your state have a policy and a strategy that guides your state research investments and university activities?*** Research at institutions of higher education is one of the most obvious ways that public policies influence innovation. The federal government is the key public sector funder of research and development (R&D), but states are increasingly creating their own R&D funds and using them to:
  - Make investments to gain talent, build top-notch research enterprises, and compete for federal dollars in those focused areas where the state can be world class;
  - Encourage, even mandate, collaboration among universities, the private sector, and other institutions;
  - Push the application of technology and commercialization of research; and
  - Hold the recipients (e.g., universities, companies) of public investments accountable for delivering on promised benefits (Waits, 2007).
- ***Are university missions aligned with the local economies' competitive strengths and industry needs?*** The growth of high-technology complexes in places like Boston, the San Francisco Bay area, and Raleigh-Durham is often attributed to the localized knowledge spillovers associated with university research. Put another way, the growth of high-technology innovation hubs is often attributed to the smooth pathways that allow intellectual and human capital associated with university research to flow to enterprises in local economies. And although the term "technology transfer" is often taken to mean that ideas flow from researchers to industry, it is often the reverse: private-sector firms can alert researchers to practical problems and market opportunities, enabling them to focus on research with real commercial potential.
- ***Does your state have effective public–private collaborations?*** Enhancing the links and collaboration among universities, research institutions, entrepreneurs, venture capitalists, supply chains, and other actors can enrich the innovation ecosystem that often benefits all parties, and generates real economic benefits, as indicated by the experience of organizations like UCSD-Connect, a San Diego-based organization that promotes university-industry networking in biotechnology.
- ***Are universities encouraged to work with small and medium-size businesses?*** Similarly, are tax credits and tax incentives for investment in research and/or for commercialization of research available specifically to entrepreneurs and young firms? Entrepreneurs and small firms can play a key role in introducing new technologies, new products, and new industries.
- ***Do you have private-sector firms with the capability to take advantage of your research?*** Research, although often intrinsically valuable, doesn't automatically translate into local economic advantage. Unless there is a strong local ecosystem of businesses (and especially entrepreneurs) that can capitalize on an idea, and a good network connecting research establishments to private firms, research ideas may not get developed locally.
- ***Does your state's intellectual property management policies encourage the greatest use of state-funded research?*** Since the passage of the Bayh-Dole Act in 1979, universities have been able to obtain patents for ideas developed based on federally funded research. That has led many more academic institutions to patent their work and to establish technology transfer offices to try to license these patents and recoup some financial return from the research. Despite a few notable financial successes—New York University has earned several hundred million dollars in royalties for its role in the development of the pharmaceutical Remicade, for example—big returns are generally rare. One concern is that by looking to sell their intellectual property, universities may limit potentially fruitful interactions between their researchers and private firms.

The Role of Financial Capital and Investment

The importance of financial capital for long-term economic growth in a free market economy is obvious. Businesses and consumers depend on the availability of capital to purchase long-lived assets that improve productivity (new plant and equipment), allow for job retention and growth, and provide a stream of benefits (like a college education or a new house). Absent effective capital markets, businesses and consumers cannot undertake the kind of long-term investment strategies that facilitate growth.

There is strong evidence that the development of financial institutions and intermediaries (banks, stock markets, letters of credit, etc.) played a critical role in enabling modern industrial economies (Levine, 1997). And it is still the case that a key factor limiting growth in underdeveloped countries is the absence of effective financial institutions. When capital markets suddenly seize up in developed nations like the United States—as they did in the fall of 2008—growth quickly comes to a grinding halt.

For most kinds of consumer and business investment in the United States, capital is widely and, in most cases, equally available across the nation. Accordingly, capital plays only a limited role in explaining variations in long-term state growth rates. Two key exceptions to the limited effect of variations in capital availability would seem to be, one, risk capital for new and high-growth businesses, and, two, lack of adequate access to debt and equity for businesses in rural and economically distressed areas.

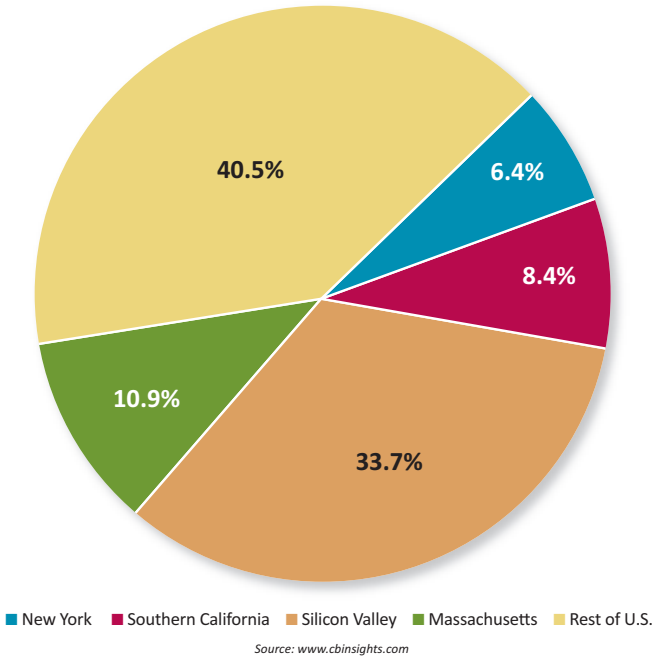
What is the Evidence?

A key characteristic of capital markets in the early 21st century is their fluid and interlinked character. With the integration and globalization of finance in the past three decades, businesses face similar terms (interest rates and maturities) and underwriting standards in every state, indicating that variations in state long-term growth rates are not likely explained by variations in the health of the state financial system. One recent empirical investigation of the relationship between bank deposits per capita—a proxy for private capital and the size of a state's financial markets—has a statistically insignificant relationship with state economic growth. This finding is consistent with the published literature on the subject (Bauer, Schweitzer, & Shane, 2011).

The picture changes when considering venture capital and seed capital—sources of financing for young, risky ventures. Although conventional business lending for property and equipment is widely available on similar terms nationally, venture capital—equity investments in startups or new firms with few assets—is very concentrated in just a few regions of the country (Figure 13). Seventy-five percent of venture capital investments in 2010 were made in five states. New York, the San Francisco Bay area, and the Boston area have accounted for a majority of national venture capital investment over the past several decades (Lerner, 2010). This kind of equity investment is actually very time-consuming. Venture capitalists tend to invest in firms that are located nearby or in well-developed clusters.

Venture capitalists provide much more than financing business growth at the critical early stages. Venture capitalists assist business plan development, become board members, lend management skills, suggest strategic partnerships and alliances, assist in expansion plans, and can bring in key talent where needed.

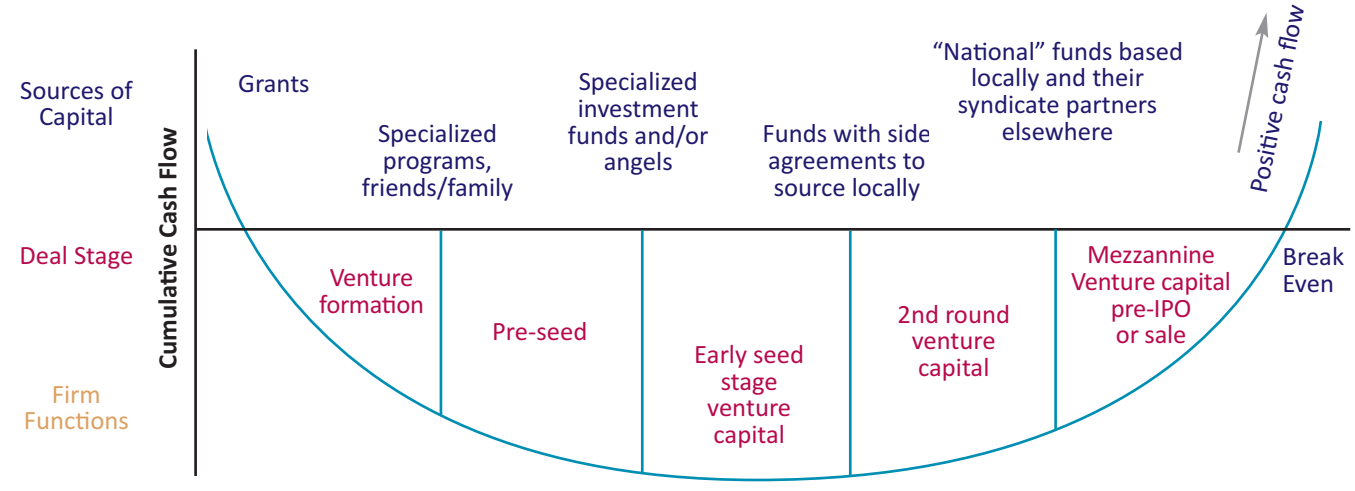
FIGURE 13. 2009 Venture Capital Funding by Geography (# of Deals)



Source: www.cbinsights.com

Although venture capital is critical for the growth of new businesses, it is early stage and seed capital that ultimately determine whether they are formed in the first place and whether they survive the "Valley of Death." (See figure 14 for the capital continuum and Valley of Death.) The Monitor Entrepreneurship Benchmarking Survey suggests that venture capital is failing to

FIGURE 14. Firms Can Get Stranded in "Death Valley" without Seed and Angel Capital



Source: Battelle

cover a crucial financing gap at the earliest stages of the startup cycle. On average, 52 percent of respondents worldwide said there is a sufficient supply of equity capital for growing firms, but only 37 percent said there is sufficient supply for *starting* them. In the United States, 45 percent of respondents say there is a sufficient supply of venture capital to grow high-risk firms, but only 32 percent think there is sufficient supply of seed capital to start them (Monitor Group, 2009).

More often than not, entrepreneurs invest considerable personal resources (both cash and sweat equity) before they seek additional funds. It's not uncommon for entrepreneurs to take out a second mortgage on their homes and "max out" their credit cards in the early stages of launching a company. Moreover, angel investors (wealthy entrepreneurs, family members, or friends investing $25,000 to $50,000 at a time), along with government programs, such as funding from Small Business Innovation Research (SBIR) and the Small Business Administration, provide the early stage funding before venture capital steps in (Sohl, 2012).

What Have We Learned Recently?

Following a considerable contraction in investment dollars in 2008 and 2009, U.S. angel investments are on an upward trend. Angel investors shelled out $22.5 billion in investment dollars during 2011, up just over 12 percent from the previous year's total, according to the 2011 Angel Market Analysis. Forty two percent of 2011 angel investments were in the seed and startup stage (Sohl, 2012).

Venture capital funds are increasingly concentrated in top-tier funds. In the United States, fewer funds are raising more capital. U.S. venture funds during 2011 had 5 percent more capital than those in 2010, hitting $16.2 billion. However, the number of funds plummeted 12 percent, to 135 funds, and, for the first time in three years, the median fund size rose to $140 million (Ernst & Young, 2011).

Small business credit markets have improved, and the demand for small business loans started to increase in 2010. Banks tightened the loan credit standards during the recession, but since 2009, business credit markets have improved. Most senior loan officers report that they are no longer tightening their lending standard for small business, according to the Federal Reserve Board. However, the Federal Reserve Board also notes that lending standards "remain quite stringent following the prolonged and widespread tightening that took place over the past few years" (Dilger and Gonzales, 2011). According to the Federal Reserve and the National Federation of Independent Business (NFIB), anecdotal evidence shows that supply is not meeting demand for small business credit from the borrower's perspective (Booze Allen Hamilton, November 2011).

Who Says?

The concentration of venture capital firms may be a rational allocation of scarce resources. Many venture capital investments are in industries where geographically localized knowledge spillovers are likely to be important (Lerner, 2010).

DESIGNING POLICIES TO IMPROVE ACCESS TO CAPITAL

Policy Questions and Directions

From a public policy standpoint, every state has a strong stake in a well-functioning system of finance. But most of the key policy decisions influencing finance are made nationally (and in households) rather than in state capitals. The special challenge of finding venture capital and angel investments for startup and high-growth firms has led states to experiment with capital formation solutions. In designing policies to improve access to capital, answers to the following three questions are critical:

- ***What does the continuum of capital look like in your state?*** It is not always clear which kind of financing is most necessary at a given time or in a particular environment. It is also sometimes hard to determine how accessible the financing is to local entrepreneurs and businesses. Is there a sufficient supply of debt and equity capital for growing firms, a sufficient supply of seed capital to start companies, and a sufficient supply of proof-of-concept funds for researchers and inventors? State finance is not needed in markets that are well-served by existing businesses or investors.
- ***Is your state taking advantage of federal financing programs, such as the State Small Business Credit Initiative (SSBCI) and several U.S. Small Business Administration (SBA) programs?*** Most states and territories that were eligible have applied for their share of the U.S. Treasury Department's $1.5 billion SSBCI allocation, which provides direct support to states to increase small businesses' access to credit. The SSBCI provides an opportunity for states to develop programs in response to unique gaps in local markets. According to the U.S. Government Accountability Office (GAO), many states are using the funds for venture capital programs, both to fill perceived gaps and as a means of retaining existing businesses as they expand (GAO, GAO–12–173, December 2011). The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs provide funding for early stage technology ventures that are still too high-risk to attract funding from private investors. Both programs are coordinated by the SBA and offer applicants a three-phase development cycle.
- ***One of the most important policy considerations is deciding on the structure and governance of public investment capital funds.*** For example, SSBCI funds can be used for a state-run venture capital fund (which may include other private investors) that invests directly in businesses. It can also be a fund-of-funds, which is a fund that invests in other venture capital funds that in turn invest in individual businesses. Research and state experience revealed that the following conditions are important for success:
  - Set clear objectives and devise performance measurements that relate to those objectives;
  - Emphasize return on investment (fund managers invest only in companies with good prospects for a positive rate of return on equity capital);
  - Use skilled and experienced management to help realize return on investment;
  - Let the market provide direction and discipline (require that a substantial amount of funds be raised from nonpublic sources or use matching funds to determine where public investments go);
  - Pay attention to deal flow (put significant resources into generating deals from the local academic and business scientific and research base); and
  - Realize that programs need creativity and flexibility (Lerner, 2010).

The Role of Global Markets

The dominant fact of economic life is the globalization of a wide range of activities. Although the transition to global competition is often difficult, it is a challenge that every state faces, and must deal with directly, to prosper and create jobs.

Globalization is in part about exporting goods, but is increasingly becoming more complex and pervasive. Goods like agricultural commodities, pharmaceuticals, electronics, and industrial machinery are items we commonly think of as exports. More and more though, growth is coming from the sales of a diverse range of services, including tourism (services provided to foreign visitors to the United States), movies, music, software, and financial services. The process of exporting is becoming deeply enmeshed in a range of major corporations. Many leading U.S. firms—like Nike, Coca-Cola, and General Motors—now get a majority of their sales outside the United States. These multinational firms produce and sell their products on a global basis, and U.S. jobs are often part of a complex chain of value-adding activities, from innovation and design to manufacturing, distribution, and service. Exporting, in all these complex forms, typifies modern industrial economies.

Exporting is a hallmark of what economists call "traded sectors" or "traded clusters" of the economy. Broadly speaking, the economy can be divided into two parts—traded and local. The traded sector consists of firms that sell their goods and services into the broader national and global marketplace. The local sector consists of firms that sell their goods and services primarily or exclusively to local residents. Most manufacturers find themselves in the traded sector—cars, planes, oil, and electronics are all sold in a global marketplace. Most retail activity and many services are essentially local, in that they exist to serve the needs and market provided by local customers.

Traded sector businesses, the ones that export and face competition from imports from other countries, are critically important to state economies. The fact that they face foreign competition head-on sharpens their skills to perform at the forefront of the global economy. They are also the businesses that provide most high-wage jobs.

What is the Evidence?

Global markets provide job opportunities. Many American firms sell a large fraction of their products to customers outside the United States, and these sales directly contribute to domestic employment. According to one recent study, exporting supported 11.8 million jobs in the United States in 2008 (Istrate, Rothwell, & Katz, 2010).

Selling to global markets is associated with higher worker wages. Each additional increase in exports of $1 billion was associated with a 1 percent to 2 percent increase in worker wages (Istrate et al., 2010).

Exporting is important because it forces U.S. businesses to compete against the best in the world and, in the process, improve their performance. Global markets are a great testing ground. By competing in the global marketplace, businesses are exposed to international best practices, new knowledge and ideas and technology that lead to innovation, further productivity improvements and economic growth. Exporters are consistently found to out-perform non-exporters using a variety of measures of success, including profitability, production, wages and sales volumes.

Tapping the large global marketplace also enables firms to spread the high fixed costs of technological and capital investments. Costs are spread over a larger number of customers, thus providing goods and services at lower costs to everyone else and enabling continual product and technological improvement (Jones & Romer, 2010).

Who Says?

The importance of exporting and tapping global markets has been long established in economics. The doctrine of comparative advantage, developed by the classical economist David Ricardo in the 19th century, outlined the argument for comparative advantage: when each country specializes in the production of the goods and services in which it is most adept, this maximizes the total value for all the parties involved in trade (Ricardo, 1817).

This fundamental insight has been augmented in the past two decades by the development of the "New Trade Theory," which added further complexity (and realism) to Ricardo's model by accounting for the benefits associated with the greater variety of products that are available to consumers because of well-developed bi-directional trade between industrialized nations. Paul Krugman shared the Nobel Prize for Economics in 2008 for helping develop these insights (Krugman, 2008).

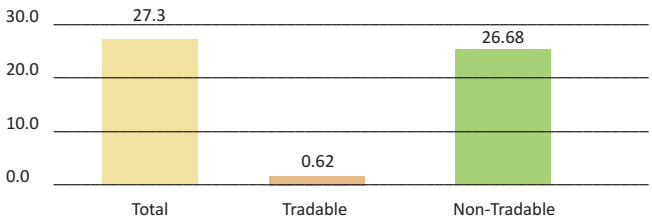
Nobel Prize–winning economist Michael Spence points out the importance of expanding the export sector of the economy. Over the past two decades, we have increased the value-added per worker and the earnings of workers in our export industries, but have added very few net jobs in these sectors (Spence, 2011).

What Have We Learned Recently?

Most of America's recent economic growth has come in the non-traded sectors of the economy—particularly retailing, government, and health care—where value-added growth and wages have stagnated. As shown in Figure 15, between 1990 and 2008, the traded sector of the U.S. economy added just 600,000 jobs, while non-traded businesses added 26 million (Spence & Hlatshwayo, 2011). The challenge is therefore two-fold: first, to increase export activity (where high-wage jobs are disproportionately found) and, second, to improve the value-added of the non-traded sector (a topic addressed earlier in this report under productivity).

Global markets are growing faster than the domestic market and there are particularly large opportunities in the so-called emerging economies. The overall value of world trade is growing more than twice as fast as the overall U.S. economy. The Organisation for Economic Co-operation and Development projects that real world trade will grow 4.8 percent in the coming year, but U.S. GDP will grow only about 2 percent. The difference is

FIGURE 15. Total Change in Jobs, 1990–2008, and by Tradable and Non-tradable Sectors of the Economy



Source: Spence & Hlatshwayo, 2011

expected to widen in 2013 (Organisation for Economic Co-operation and Development, 2011).

Less than 5 percent of U.S. small and midsize companies (SME) export, even though 95 percent of the world's customers live beyond U.S. borders. In 2012, nearly 60 percent of all SME exporters only exported to one foreign market. There is evidence, however, that U.S. SMEs that export are more productive and generate more revenue than SMEs that do not export. A recent International Trade Commission survey found that exporting small and medium sized manufacturers in 2009 had more than twice the total revenue of their non-exporting counterparts. They experienced revenue growth of 37 percent between 2005 and 2009, while total revenue declined by 7 percent for non-exporting SME manufacturers over the same period. (United States International Trade Commission, 2010).

DESIGNING POLICIES TO BOOST GLOBAL LINKAGES AND BUSINESS

Policy Questions and Directions

- ***Does your state have an integrated approach to the global marketplace?*** Although the policy focus of a state economic development program may be on increasing exports, it is important to recognize that export promotion takes place in the framework of a state's broader positioning in a global economy. With a goal of connecting more citizens and businesses to opportunities around the globe, states will likely need to institute the following three policies to be successful (Conway & Nothdurft, 1996):
  - Develop a vigorous trade development system that deeply integrates the public and private sectors;
  - Create a capacity to manage the state's foreign affairs; and
  - Foster a supportive civic capacity for going global.

  Within the context of the larger international framework, there are a number of specific tactics states can undertake to encourage exports, including supporting established traded sector exporters, helping small-scale exporters expand, and judiciously working with non-exporters to evaluate export markets.
- ***Are the state's principal traded sector industries engaged globally?*** It is likely that the largest source of exports from any state comes from the established traded sector clusters that make up a state's economic base. The best opportunities to expand exports generally come from working to improve the competitiveness of these clusters. Industry-wide efforts to advance production technology, improve worker skills, increase productivity, or reduce costs can help encourage export growth.
- ***Is there support for small-scale exporters to expand their efforts?*** Although larger firms and those in clusters will often have well-developed strategies for pursuing exports, many small-scale exporters are primarily passive participants in the global market. In these cases, targeted state efforts to help firms more actively examine and pursue export markets will be effective.
- ***Are non-exporters encouraged to realistically explore the global marketplace?*** Most businesses, especially smaller business, will not have experience in exporting, for good reason: most businesses lack the scale and resources to successfully pursue an export strategy, have products or services not suitable for foreign markets, or are not cost-competitive. Many businesses may be struggling to find a niche in the domestic market and would be ill-advised to lose focus by seeking to export. But some small businesses that are non-exporters today may be good candidates to export their products. The policy challenge here is to identify those businesses with real export potential.

- ***Does the state support a wide range of means for businesses to tap the global market?*** Although a focus may be on exports, it is important to recognize that international trade is a complex, multifaceted process. Imports, immigration, cultural exchanges, international education, and inward investment are also component parts of any state's international position. Most of the infrastructure for international trade in any state is in the private sector of the economy; building effective partnerships with those who are already deeply involved is the key to effectiveness.
- ***Are you leveraging broader social and cultural relationships to foster trade and globalization?*** Many, perhaps most, firms—even in the traded sectors of the economy—will be ill-equipped, or would be ill-advised to pursue an export-driven strategy. Exporting is not for everyone. Some firms may find it more sensible to pursue alternative strategies for participating in global markets. Rather than exporting, many U.S. businesses license their goods and services or business models to firms in other nations, generating income from their intellectual property, while leaving the complexity, cost, and financial risk of working in a foreign market to firms more familiar with the terrain.

> With pressure on government budgets at all levels, rapidly rising health care costs, a fragile housing market, the post-crisis effort to curb excess consumption and boost savings, and the risk of a second economic downturn, it is highly unlikely that net employment in the non-tradable sector of the U.S. economy will continue to grow as rapidly as it has been. Therefore, the United States will need to focus on increasing job growth in the tradable sector *(Spence, 2011)*.

The Role of Industry Clusters

Clusters are geographic concentrations of similar and related firms, their workers, and supporting institutions. Every state economy has clusters of firms—regional specialization is one of the hallmarks of advanced economies. Clustering is common in both high- and low-tech industries.

Clusters are important because a business's success depends not just on its capabilities, but on those of the firms, workers, and institutions in its nearby environment. A concentration of firms attracts a concentration of workers and encourages them to develop their skills. This also attracts supplier industries.

Clusters also advance knowledge as specialized information about markets, technology, competition, and best practices is developed and spreads more quickly in such clusters. The health of a state economy depends on the competitiveness and productivity of its principal industry clusters.

What is the Evidence?

There have been extensive studies of exemplary clusters—places like Hollywood, Silicon Valley, or New York's financial district. In the case of industries ranging from motion pictures (Scott, 2004), to carpet manufacturing (Krugman, 1991), to electronics (Saxenian, 1994), a strong concentration of businesses in a relatively small geographic area creates a strong dynamic of competition and innovation, attracts and develops competent workers, and leads to successive generations of new startup businesses that create jobs.

In addition to these case studies, there is good economic evidence that clustering helps improve productivity, promote innovation, and increase value-added, which enable firms to pay higher wages. Here is a sampling of that statistical evidence:

Clustering improves worker productivity. Vernon Henderson looked at employment, productivity, and wages in a series of manufacturing industries across the nation over a period of two decades (Henderson, 1997). His results showed that same-industry concentration—a measure of clustering—was positively correlated with higher manufacturing productivity. Workers in clusters were more productive than similar workers in the same kind of firm that was not located in a cluster.

Strong clusters pay higher wages. One study investigating the effects of industrial and occupational specialization on manufacturing wage levels across 220 metropolitan areas found that for the typical metropolitan area, a doubling in employment concentration in a particular industry is associated with a 2 percent increase in wages (Wheaton and Lewis, 2002). Another study by Gibbs and Bernat (1998) investigated the effects of industry clustering on wages, finding positive and significant cluster wage premiums for 14 of 18 manufacturing industries nationally. Overall, wages for workers in industry clusters were about 6 percent higher than for workers in the same industry who were not part of a cluster. Figure 16 compares the wages in Traded Sectors, Local Sectors and Natural Resources Sectors in the U.S. Economy.

FIGURE 16. The Composition of Regional Economies, United States, 2008

	Traded	Natural Resource-Based	Local
Share of Employment	27.4%	0.9%	71.7%
Employment Growth Rate, 1998 to 2008	0.3%	0.6%	1.6%
Average Wage	$57,706	$40,142	$36,911
Relative Wage	135.2%	94.1%	86.5%
Wage Growth Rate, 1999 to 2007	3.9%	2.9%	3.3%
Relative Productivity	144.1	140.1	79.3
Patents per 10,000 Employees	21.5	1.6	0.3

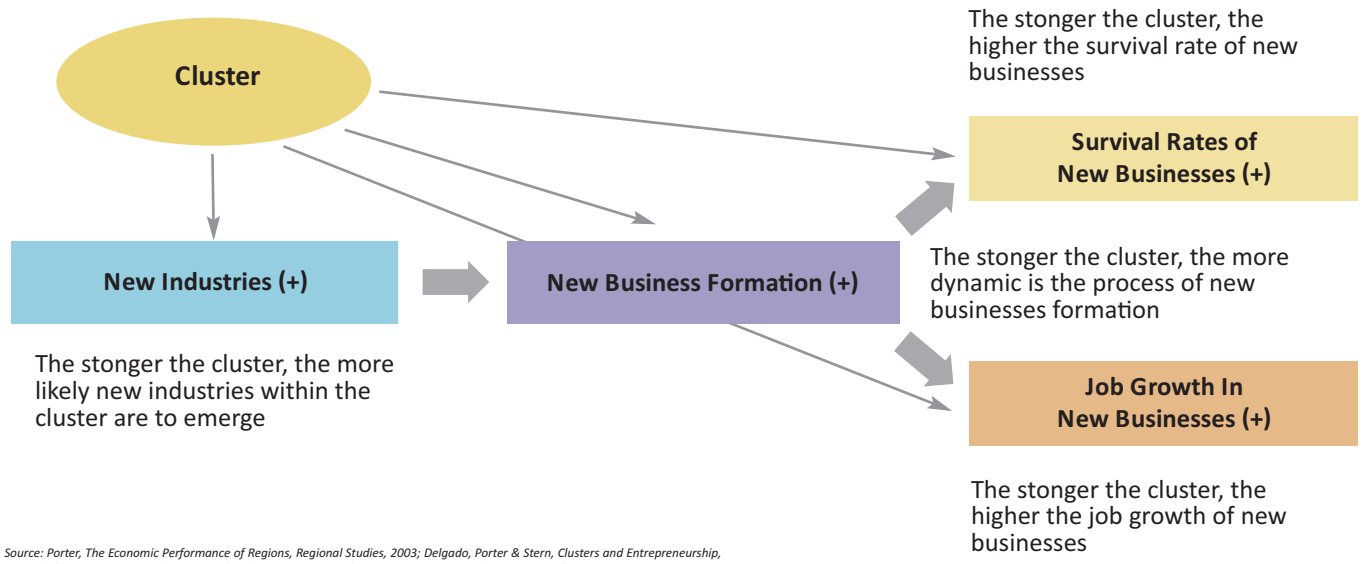
Source: Prof. Michael E. Porter, Cluster Mapping Project, Institute for Strategy and Cmpetiveness, Harvard Business School; Richard Bryden, Project Director

Clusters promote innovation. It is now broadly affirmed that strong clusters foster innovation through dense networks of trust and cooperation that reaches across firms, colleagues, rivals, and knowledge institutions like universities in close proximity (Audretsch& Feldman, 2004).

Who Says?

The idea of industry clustering is well established. Alfred Marshall, an English economist writing at the end of the 19th century, outlined the key rationale for clusters when he described the economic advantages to businesses that were located in industrial districts (Marshall, 1920). More recently, Paul Krugman, winner of the 2008 Nobel Prize for Economics, developed a formal theory of how increasing returns—the additional economic benefits that firms get from being in a place where there are other similar firms—encourage the concentration of economic activity in particular places (Krugman, 1991).

FIGURE 17. **Clusters and New Business Formation**



Source: Porter, The Economic Performance of Regions, Regional Studies, 2003; Delgado, Porter & Stern, Clusters and Entrepreneurship, Journal of Economic Geography, 2010; Delgado, Porter & Stern, Clusters, Convergence, and Economic Performance, 2010.

What Have We Learned Recently?

- ***Strong clusters help accelerate job growth in local economies.*** Michael Porter and his colleagues investigated the relationship between cluster strength and economic performance for a series of regional economies across the United States for the period 1990 to 2005. They found that employment growth was stronger in a region's industries if they were part of a strong cluster (Delgado, Porter, & Stern, 2010).
- ***Strong clusters promote entrepreneurship.*** Michael Porter and his colleagues also found that industries located in regions with strong clusters (i.e., a large presence of other related industries) experience higher growth in new business formation and start-up employment (Figure 17). Strong clusters contribute to start-up firm survival as well. (Delgado et al., 2010).

> The dramatic spatial unevenness of the real economy—the disparities between densely populated manufacturing belts and thinly populated farm belts, between congested cities and desolate rural areas, between the spectacular concentration of particular industries in Silicon Valley and Hollywood—is surely the result not of inherent differences between locations, but of some set of cumulative processes, necessarily involving some form of increasing returns, whereby geographic concentration can be self-reinforcing
> *(Krugman, Fujita, & Venables, 1999).*

DESIGNING POLICIES TO SUPPORT INDUSTRY CLUSTERS

Policy Questions and Directions

- ***Do you understand your state's distinctive cluster strengths?*** Every state has its own distinctive set of industry clusters. Understanding your state's clusters is a critical step in fashioning an economic strategy. In addition to using the cluster concept to understand a state's economy, governors can use clusters as a way to communicate with businesses and organize economic development efforts. The typical state economy consists of tens of thousands of independent businesses. Using clusters as an organizing tool—grouping businesses according to common industry interests and similar technologies and markets—is a logical way to identify policy priorities and simplify the task of understanding and communicating with large numbers of firms.
- ***Does your state make use of clusters to organize its economic development efforts?*** Clusters also turn out to be the logical units for organizing practical efforts to address a range of economic competitiveness issues. For example, clusters often have common interests in supporting industry-related research or developing specialized programs to train workers in needed industry skills. Clusters also turn out to be hotbeds of innovation and entrepreneurial activity. A deep prior knowledge of an industry—its markets and technology—is often a prerequisite to starting a new firm or devising a new product or process. The people with the necessary skills and insight to be entrepreneurs or innovators are much more likely to be found in places where there are strong clusters. As states look to generate new businesses and encourage innovation, working with clusters is frequently the best source of opportunities.
- ***Is your state realistic about its cluster strengths?*** You cannot create a cluster from nothing. In their review of the genesis of clusters, Feldman and Braunerhjelm (2006) note that "clusters are born and develop on the basis of specific combinations of capabilities, incentives, and opportunities." The presence of capabilities—including the presence of localized knowledge, a skilled workforce, and the availability of capital—creates opportunities for entrepreneurship and collaboration, where these opportunities can be realized in the presence of appropriate incentives. Public policies can play a role in developing the necessary capabilities, opportunities, and incentives for the development of clusters. The key is to be strategic in making public investments and to have a long-term strategy.
- ***Are you prepared to deal with stable or declining clusters as well as growing ones?*** There is no guarantee that just because you have an industry cluster, even a long-established one, that it will continue to grow, or even exist indefinitely. Clusters are subject to competition and decline, just like the businesses that make them up. Although some clusters do decline, most evolve over time. Having a robust and active engagement with all your clusters is the best way to cope with this ongoing process of economic change.
- ***Does your state adapt its response to the different needs of each cluster?*** One of the key concepts underlying clusters is the notion that every cluster is different, has different problems, and presents different opportunities for state policy to influence cluster economic success. A successful state cluster development effort has to allow for these differences. Some clusters may be highly organized and ready to work with the state on a wide range of specific issues; others may be less organized or interested, or have only a few narrow interests. A good cluster strategy meets each industry on its terms and works from there.

CONCLUSION

For all the tough issues states face today, economic growth is one of the most important and most perplexing to address. Addressing that issue includes, and goes beyond, creating a competitive tax and regulatory environment. This report is designed to provide governors and other state policymakers with some answers to the key question: What can be done to create more good jobs in our state economies? It highlights six factors for state policymakers to consider in their agenda:

- Entrepreneurs: the individuals who seed, grow, and renew businesses;
- Education and skills: the concentration of highly educated, highly skilled individuals within economies;
- Innovation and technology: the new ideas and technologies that enter the economy and change what is produced, how it is produced, and the way production itself is organized;
- Private capital: the sufficiency and availability of debt and equity financing at all stages of company formation;
- Global markets and linkages: the businesses competing successfully in global markets; and
- Industry clusters: the firms embedded in regional clusters supported by institutions providing education, training, finance, and marketing services, which experience higher rates of job and wage growth than comparable firms not embedded in such clusters.

This list of growth factors is certainly not exhaustive. But it includes the basics—the widely agreed upon essentials—for creating good jobs and promoting economic growth. The report emphasizes the insights of respected economists—including Nobel Prize winners—in each area and includes the latest data and evidence about how the six factors promote economic growth.

Finally, the report considers how state policies can influence progress in each area, emphasizing particular things states can do to help more:

- Startups launch and grow;
- Companies find skilled labor and innovations;
- New ideas and new technologies gain acceptance in the marketplace;
- Firms navigate private capital markets;
- Firms compete globally; and
- Firms and workers capture benefits by being embedded in regional clusters.

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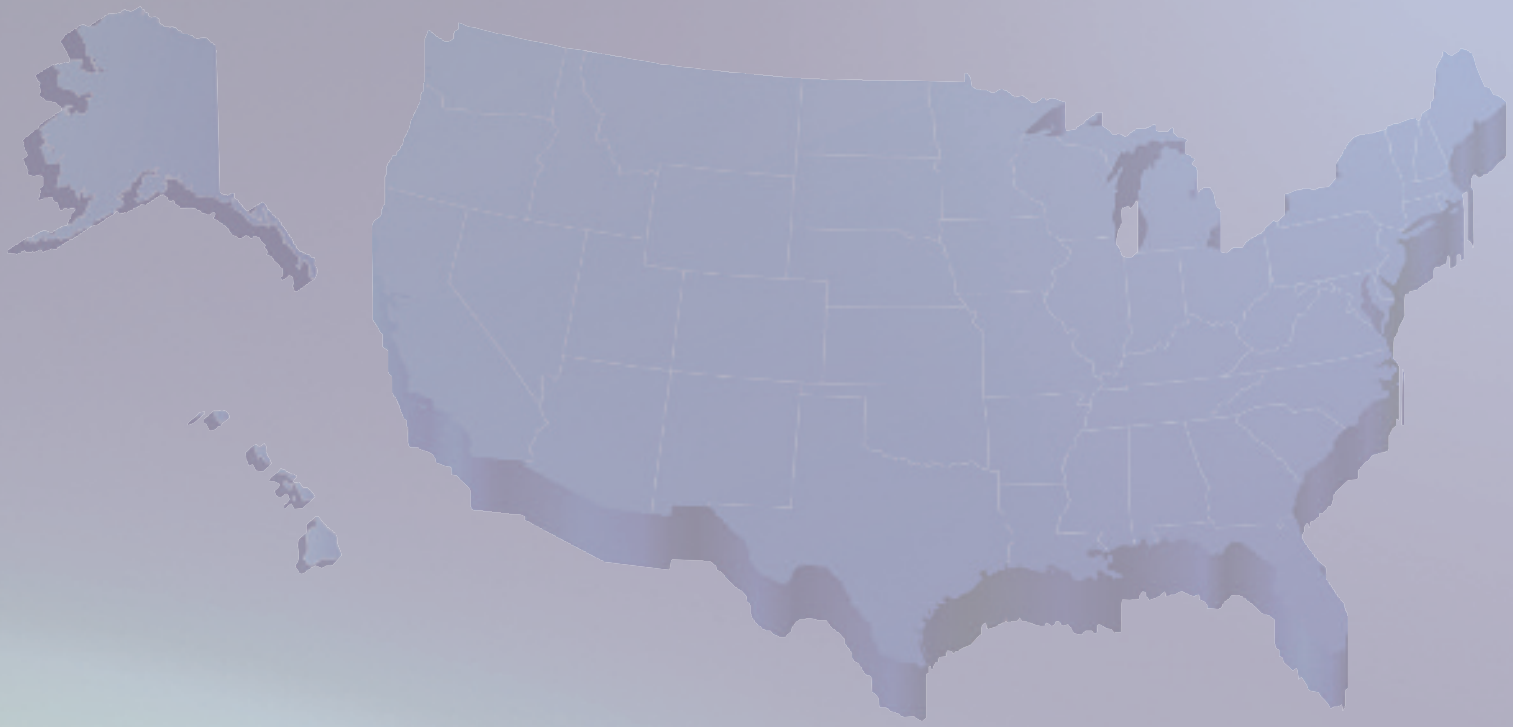

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