

EXECUTIVE SUMMARY



Innovation drives economic growth. This is one of the most consistent findings in macroeconomics, and it's been true for centuries. America's genius for innovation and entrepreneurial drive is well known—with our openness and enthusiasm for practical innovation from the steam engine to the search engine—to be the primary reason for America's economic preeminence. Economists have calculated that approximately 50% of U.S. annual GDP growth is attributed to increases in innovation.

The states and regions that lead the transformation to the knowledge- and technology-based economy currently have enormous advantages. Silicon Valley is likely to remain the leader for the foreseeable future, ensuring California's tech status for the future. The region's combination of a skilled workforce, available capital, infrastructure, and record of successes makes it inconceivable the Valley will lose its primacy any time soon.

Governments, public-private partnerships, and development organizations across the world have attempted to emulate Silicon Valley for decades. Some of those efforts have paid off, as science, technology, engineering, and math (STEM) employment has dispersed to many states across the nation. Although only a fraction of companies around the world may consider themselves to be in the technology business, the great majority increasingly rely on technology to operate and

compete. Particularly as we look at the growth of both technology industry jobs and those occupations that require STEM-related skills, the pattern of growth is far more dispersed. This pattern is best measured by tracking the trajectory of STEM jobs, which cover technical skills but are deployed across industrial sectors.

Indeed, despite the social media boom, California ranked 6th in this year's Enterprising States survey of high-tech performance, behind five widely divergent states that span the entire country from Washington to Massachusetts. Much of the growth is from not only what we traditionally think of as "high tech" but also a broader realm of industries extending from medicine, manufacturing, and energy, to business services.

The future of America's states—and their ability to meet major economic, social, and environmental challenges—rests largely on how they adapt to and take advantage of changes in technology. There was a time when state economic development programs focused only on implementing big-dollar tax incentives and recruiting huge employers from other states or countries. In recent years, growing from within by supporting expanding young employers and assisting new startups has become a stronger, if not the primary, focus of job-creation efforts. Many state-led strategies for business growth are now based on the assumption that innovation and technology development drive growth and



competitiveness in a 21st-century global economy. Technology entrepreneurship is distinguished from other entrepreneurship types (such as social entrepreneurship, small business management, and self-employment) by collaborative experimentation and production of new products, assets, and their attributes, which can be intricately related to advances in scientific and technological knowledge and the firm's asset ownership rights. "Innovation-driven enterprises," which include a wider universe of entrepreneurial firms whose competitive advantage might be a process, service, or business model, are also an important piece of the puzzle for states wanting to foster a more innovative economy.

Why do states target high-tech firms? Innovation-driven technology-intensive businesses are viewed favorably for their potential and disproportionate impact on competitiveness, future economic growth, and prosperity because they often:

- create jobs that command above-average salaries;
- pay a high percentage of their income to their employees, rather than out-of-state capital equipment or out-of-state raw materials;
- can be located almost anywhere because of the connective power of the Internet and improved transportation systems, particularly air travel;
- create additional quality jobs that are not technology focused, both inside and outside the companies themselves; and serve markets that are outside the state, thereby bringing new wealth into the state.

"Technology-based economic development" is the approach employed by states to help create a business climate and to enable an environment where an economy based on innovation and technology can thrive. There is no single recipe for successful tech-based development, yet there are critical ingredients. Based on the experience of tech-based economies like Silicon Valley and North Carolina's Research Triangle (both now well over 50 years long-standing) the following elements are the essential, synergistic building blocks for building a tech-based economy, according to the State Science and Technology Institute:

- a research base that generates new knowledge,
- mechanisms for transferring knowledge to the marketplace,
- sources of risk capital,
- a technically skilled workforce, and
- an entrepreneurial culture.

Each state has its own portfolio of policies and programs to build a more innovative, tech-based economy; some states are focused on a small number of initiatives targeted to a single stage of the business lifecycle or industry sector while others have put in place a very comprehensive framework—an ecosystem approach—that aligns policies, programs, and resources in a highly integrated system that encompasses the entire research, development, demonstration, and commercialization process, that is, the five elements of a tech-based economy.

State Initiatives in Innovation and Entrepreneurship
State-led and state-supported initiatives are often implemented in cooperation with local or regional development organizations and businesses, including the following:

- Accelerator and incubator initiatives that focus on starting and growing technology firms
- Economic gardening initiatives that offer specialized services to expanding existing firms with strong growth potential
- Business ecosystem initiatives, with a regional or industry-specific (cluster) focus, which take a comprehensive approach to creating an environment that is highly conducive to technology startups and mature firms in a particular industry
- Investments in university research and in advanced research and technology facilities or specialized equipment
- Co-working spaces, collaborative lab spaces, or maker space settings that encourage innovation through collaborative design and development and access to specialized equipment
- Proof-of-concept funds to do early-stage evaluations of the commercial feasibility of a new or improved product, process, or service
- Infrastructure investments that provide high-speed broadband service networking and collaboration initiatives that bring small businesses and entrepreneurs together with large companies and universities
- Mentoring programs that connect entrepreneurs with experienced business professionals, including entrepreneur-in-residence programs
- International trade programs that help businesses reach out to new global export markets.
- Incentive programs and tax abatements that target specific technology sectors
- Fostering an enterprise-friendly business environment by cleaning up the DURT (delays, uncertainty, regulations, and taxes), modernizing government, and fixing deficiencies in the

market that inhibit private sector investment and entrepreneurial activity

- State-operated or state-funded seed and venture funds that focus on startups and expanding technology firms
- Matching fund programs to leverage government or private sector funds, such as the federal government's Small Business Innovation Research program
- Crowdfunding laws that allow entrepreneurs to raise modest amounts of capital from informed investors
- Seed capital tax credit incentives for equity investments
- Coordination and support of angel fund networks
- Education programs for in-state, high-net-worth angel investors about equity investment
- Specialized training programs at technical colleges and universities for specific technology sectors and individual businesses
- Expansion of STEM programs at the K–12 and postsecondary levels to prepare students for technology occupations and pursuits
- Workforce development initiatives that help technology companies connect with and train the talent they need to operate and compete, including the expansion of internship programs for students who want to work in technology careers

In the final analysis, state policies and programs that most effectively promote entrepreneurship, innovation, technology development, and job creation are rooted in market reality. This means building on the existing core industries and technological advantages of a state while having the foresight and wherewithal for pursuing opportunities in growing and emerging sectors. Building on and sustaining existing economic momentum remains a key means of responding to the challenges of fostering growth in an increasingly competitive global economy and guaranteeing success in the future.

METHODOLOGY

Enterprising States is produced by Praxis Strategy Group on behalf of the U.S. Chamber of Commerce Foundation. The report compares states using 35 metrics that measure overall economic performance, and identifies the top ten states in five important policy areas for job growth and economic health. The six policy categories are Economic Performance, High-Tech Performance, Transportation and Trade, Talent Pipeline, Innovation and Entrepreneurship, and Business Climate.

The metrics are selected to capture the breadth of each policy area as well as possible using the data that is readily available. Data for each measure were collected for each state and normalized on a 1–100 scale. States were ranked according to performance in each topic area, using a weighted index combining each set of metrics. In the Economic Performance category, metrics are weighted to favor job growth and income measures because employment and standard of living are the outcomes that define the rationale for state economic development efforts. Metrics in each of the other categories are equally weighted.

Harold Evans, with Gail Buckland and David Lefer, *They Made America: From the Steam Engine to the Search Engine—Two Centuries of Innovators*, Little Brown and Company, New York. 2004.

Council on Competitiveness, *Measuring Regional Innovation*, 2005.

Richard Gordon and Linda M. Kimball, "Industrial Structure and Changing Global Dynamics of Location in High Technology Industry," Silicon Valley Research Group, Working Paper, No. 3, January 1986; <http://www.wsj.com/articles/michael-malone-why-silicon-valley-will-continue-to-rule-the-tech-economy-1408747795>

Greg Miller, "Pretenders to Silicon Valley's Throne," *Los Angeles Times*, March 8, 1998.

Tony Bailetti, "Technology Entrepreneurship: Overview, Definition and Distinctive Aspects," *Technology Innovation Management Review*, February 2012.

Bill Aulet and Fiona Murray, "A Tale of Two Entrepreneurs: Understanding Differences in the Types of Entrepreneurship in the Economy," Ewing Marion Kauffman Foundation, May 2013.