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## Translating innovation into US growth: An advanced-industries perspective

**The United States faces a future in which the elements of economic leadership are moving abroad. Reversing these trends will require the private and public sectors to collaborate.**

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Illustration by Curt Merlo

**Is America losing its innovation edge?** For decades, the country has debated this question in the halls of Washington, on the nightly news, and in corporate boardrooms. Pundits have looked abroad for signs—from the Soviets during the Cold War to the Japanese in the late 1980s to the Asian Tigers<sup>1</sup> in the early 2000s—that the United States was losing its economic advantage. Pessimists point to startling statistics, such as the rise in the number of patents filed by foreign inventors or the growing corps of engineers graduating overseas.

These statistics are indeed alarming. Yet despite the historical challenges, the United States has remained the home of innovation. From the Internet to mainframe servers to pharmaceuticals, major innovations are still “Made in the USA.”

So what is the disconnect? Is America’s innovation advantage simply too large to overcome? Are numbers of patents and engineers no longer relevant metrics in a digital world? Perhaps. However, we think that looking solely at innovation and leadership in basic research is far too narrow. The key question is whether the United States has been losing its ability to translate innovation into economic leadership.

To answer this question, building on recent McKinsey Global Institute (MGI) research on productivity and on the role of US multinationals, we conducted a series of interviews with CEOs of advanced industrial companies. These CEOs, who lead R&D- and engineering-intensive companies ranging from automobile and energy-equipment manufacturers to aerospace and defense players, stand on the front lines of this debate. From our conversations and original research, we see real cause for alarm.

Innovation may create profits and headlines, but it is only part of the economic engine. Intel’s Andy Grove writes that the United States has “misplaced faith in the power of start-ups.” German research labs may have created the MP3, but it was the scale-up capabilities of American technology firms that took this innovation and unlocked its value, from Apple’s iPod to file sharing to digital-media vendors like the iTunes store, and beyond. This ability to take basic innovation, deliver it at scale, and refine it with second- and third-order innovations plays a critical role in driving growth and jobs. To do all this, a country must be at the center of cutting-edge technologies, market demand, talent, and entrepreneurial spirit.

We see warning signs regarding each of these elements. The problems go well beyond jobs or patents—to the heart of US economic leadership. We do not have all the answers, but we are convinced that a course correction is necessary. Incremental steps by the public sector, through one-off tax credits and piecemeal government programs, won’t be

<sup>1</sup>Hong Kong, Singapore, South Korea, and Taiwan.

sufficient. Neither will the short-term, quarter-to-quarter mentality in America's corporate boardrooms. A national commitment and strategy are required.

### **What are the facts?**

Is the United States truly behind? From one angle, it's hard to see anything but positives. The country has a business culture and a legal and capital market system that encourage and reward risk taking and entrepreneurship. It continues to attract top students and teachers from around the globe and remains the dominant investor in research and development, with total spending more than that of the next four nations—Japan, China, Germany, and South Korea—combined.

There are clear warning signs, however, across the facets of economic leadership.

#### Cutting-edge technology

In leading industrial technologies—such as advanced batteries, high-speed rail, hybrid automobiles, solar modules, offshore wind turbines, and machine tools—the United States finds itself competing against or even catching up with foreign companies and engineers. Historically, the country has been the undisputed leader of next-generation technology, from semiconductors to IT to space. It pretty much *owned* these sectors. But today, even in an industry such as space, the United States finds itself relying on Japan, Russia, and Western Europe to launch its satellites. This issue goes beyond the well-publicized discussion around US jobs. It is at the heart of economic leadership. Without preeminence in cutting-edge technology (and the business, communications, and physical infrastructure to support it), the jobs question is moot.

#### Demand

The composition of global demand has changed dramatically over the past few decades. For the first time in recent history, more than 50 percent of the global middle class lives outside North America. Meanwhile, many next-generation engineered products are in high demand not by US or European customers but by those in Asia, Latin America, and the Middle East. From airplanes to offshore wind turbines to nuclear technology, these foreign customers are creating markets and dictating preferences, often with local-content requirements. US companies can no longer build products just for the US market and expect to export them readily without modification.

#### Talent

Partly as a result of the declining prestige of the US engineering profession and the lagging effectiveness of the education system, scientific talent is building outside the United States. Almost one-third of US manufacturing companies responding to a recent survey<sup>2</sup> say they

<sup>2</sup>*People and profitability: A time for change—A 2009 people management practices survey of the manufacturing industry*, Deloitte, Oracle, and the Manufacturing Institute, 2009.

are suffering from some level of skill shortage. Foreign labs are becoming more ambitious, leading cutting-edge research that used to be the exclusive domain of US companies and universities.

#### Entrepreneurial spirit

Entrepreneurship is the magic that binds all these elements, yet we see an increasing risk aversion toward new ventures in the United States. Large US corporations, the innovators of the previous generation, seem most affected. Part but not all of this behavior results from uncertainty about public policy and regulation, but some of it reflects past successes and a failure to think in the long term. Many of America's leading advanced industrial companies report returns on capital well above 20 to 30 percent or more—the result of decades of productivity and ingenuity but also of a depreciated existing asset base. Too often, decisions to finance and push into new product areas or to enter new geographical markets die because companies fear to dilute these high returns. Worse yet, to meet short-term earnings objectives, companies defer promising but risky plans.

#### **How should the United States respond?**

Public policy, private-sector shortsightedness, offshored manufacturing, unfair foreign subsidies, or any combination of these can all be blamed for the warning signs above. Whatever the cause, the United States faces a future in which the key elements of economic leadership are moving abroad. Action is imperative. Revitalizing US innovation and growth will require a national commitment in which the public and private sectors work together. Our research suggests a number of steps to start changing the trends.

##### 1. Clear the way for the cutting-edge industrial technologies of the future

To meet this goal, policy makers must ramp up public-sector procurement targets and set standards for next-generation technologies. Examples of the necessary policies include (1) clean power, through national standards for renewable energy; (2) transport, through mandated improvements in the fuel efficiency of automobiles; and (3) advanced composites, through Department of Defense procurement and airplane-efficiency standards.

The private sector will have to ease its paranoia about intellectual property and collaboration. US leadership in semiconductors was in part enabled by projects such as Sematech, an industry consortium to share R&D. Other advanced industries have not followed suit; the number of such partnerships outside the IT sector has stagnated.

##### 2. Rebuild infrastructure

Part of this national strategy calls for infrastructure upgrades to support US production and engineering and to cut through well-meaning but burdensome red tape and regulations that add costs and time to construction. The necessary actions include the following:

- Fast track the approval process and standards setting for selected high-priority technology areas (for example, accelerated LED-bulb-technology review, clarification of unconventional gas and wastewater standards).
- Create manufacturing-development zones with fast-track site approval.
- Develop investment incentives—for example, by allowing the tax-free repatriation of capital to finance US investment, thus tying R&D tax credits to US production.
- Emphasize efforts to build “smart infrastructure,” such as fiber-optic cable.

To help public policy coalesce and support these initiatives for infrastructure and production upgrades, private-sector leaders must work together to communicate a comprehensive social value proposition—for example, energy efficiency, reduced pollution, and an improved traffic flow—not just jobs.

### 3. Attract and retain talent

After foreign students study at US universities, the country pushes them away with restrictive H1-B<sup>3</sup> policies. Later they work for (or start up) future competitors while US companies struggle with an aging engineering workforce. The necessary moves include the following:

- Streamline green card application processes and increase the number of H1-B visas—now capped at 65,000 but in 2003 as high as 195,000.
- Expand efforts such as the US Department of Labor’s High Growth Job Training Initiative, which targets 14 key sectors for investments in workforce development.<sup>4</sup>
- Renew private-sector efforts to train, develop, and retain current engineers.

### 4. Reenergize the entrepreneurial spirit in large US companies

The rapid expansion of small, inventive companies that grow up to become large ones innovating at scale is one of the hallmarks of US leadership. The country should continue to encourage this model, and more executives of large companies should embrace it. Many of our largest, most successful industrial clients are far too wary of long-term investments, which they often measure with short-term financial-performance metrics. Executives must

<sup>3</sup>A nonimmigrant visa that lets US companies employ foreign nationals.

<sup>4</sup>See [www.doleta.gov/brg/jobtraininitiative](http://www.doleta.gov/brg/jobtraininitiative).

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reshape Wall Street’s quarter-to-quarter mentality and help these companies make the same kinds of bold but prudent decisions that made them great in the past.



We are confident that the United States can realize its innovation and growth potential. Its natural advantages are undeniable. But other countries are building up cutting-edge technology, demand, talent, and entrepreneurship, while the United States seems to be in retreat. The public and private sectors must work together to reverse that trend. [○](#)

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