

different approach to the problems of GM and Chrysler, perhaps conditioning federal aid to those companies less on short-term cost reductions and more on quality improvement and product innovation? Or, given the Obama Administration's decision to take a more hands-off approach to the latter, would the new managements of GM and Chrysler have used NIF assistance to help their companies succeed? Perhaps. At the very least, though, an NIF would have given innovation a more prominent—if not decisive—place in the policy debate about the auto industry.

The benefits of an NIF would extend well beyond the auto industry and manufacturing, though. Low productivity growth, a consequence of a lack of innovation, plagues many industries, especially service industries. Because the innovation challenges are often both technological and organizational, an NIF is ideally suited to address them. Consider health care. Electronic medical records have the potential to improve the quality of health care and keep costs down, but implementing them has been a challenge even within individual hospitals. Or take residential construction, an industry plagued by an outdated form of business organization and a reliance on low-skilled workers. If public policy is going to encourage green building materials for both retrofitting and new construction, then the industry may not be well equipped to respond. In both industries, an NIF could combine research, technology diffusion, and industry cluster grants to identify the obstacles to innovation and help firms overcome them.

Without the direct federal boost to innovation that an NIF would provide, productivity and American workers' wages will not rise as rapidly. U.S. companies will introduce fewer new products and services, and those products and services will be less likely to be developed and produced in this country. Other economically advanced nations have established effective agencies to promote innovation. It is time for the United States to do so as well. ▀

Making Washington Focus: First, Re-Educate the Economists

Robert Atkinson

From the IT startups of Silicon Valley to the bioengineering labs of the Research Triangle, America is as full of innovators as ever. But the federal government doesn't do nearly enough to encourage their work. So as we ponder the future of innovation, the key question is increasingly: Why isn't Washington doing more?

For one, the Capitol is hamstrung by an ideological gridlock that shunts pro-innovation policies to the sidelines. One party is all too often focused on limiting

government's role in the economy, while the other fails to appreciate what one crucial aspect of that role ought to be. For the former, government just gets in the way. The latter think, let business manage innovation; it's government's job to help "the little guy." As a result, both conservatives and liberals leave questions of innovation and productivity to the market.

But perhaps the most fundamental reason is that policymakers take their cues on economic policy from the economics profession, and most Washington economists subscribe to the neoclassical economic doctrine that does not understand the importance of innovation and sees almost no role for government in it. Indeed, while the economy has been transformed by technology, globalization, and entrepreneurship, the doctrines guiding economic policymakers continue to be informed by twentieth-century conceptualizations, models, and theories. Until more economists "get" innovation, it is unlikely that policymakers will get innovation policy right—but all the more likely, alas, that the country will miss out on the next wave of global economic growth.

Let's start with the second problem first. The limitations of conventional economics were driven home for me recently when I helped my 17-year-old son study for the Advanced Placement Macroeconomics exam. Page one of the test preparation book defined economics as "the study of how to allocate scarce resources among competing ends." In other words, economists don't study how societies create new forms of production, products, and business models to expand wealth and quality of life; rather, they study markets to see how commodities are exchanged. But progress doesn't come from allocating widgets efficiently; it comes from making widgets more efficiently and, even more so, by inventing the next new widget.

The other thing they should study, according to the neoclassical view, is why and how economies fall into recessions. Understanding and responding to business cycle downturns is certainly important, especially in today's economy. But it ignores the more important issue: how to expand the economy's supply potential. Conventional economists know little about this issue, and much of what they do know is wrong.

And it doesn't really matter much whether the economists are Democrats or Republicans; when it comes to spurring productivity growth, the advice is largely the same. Liberal economist and *New York Times* columnist Paul Krugman states that since we don't know why productivity slowed down in the

ROBERT ATKINSON *is President of the Information Technology and Innovation Foundation.*

1970s and 80s, “that makes it hard to answer the other question: What can we do to speed it up?” Greg Mankiw, former director of the Council of Economic Advisors in the Bush Administration, agrees, stating that “the sources of strong productivity growth [in the 1990s] are hard to identify.” With advice like this, no wonder the political dialogue gives scant attention to innovation-led growth and the policies needed to promote it.

To the extent that conventional economics focuses on growth at all, it is based on what is called the Solow growth model, named after MIT economist Robert Solow. In the 1950s, Solow’s model found that capital investment and education levels did little to explain growth. Most of growth was unexplained, and Solow called this residual, “technological and related innovation,” which is wholly separate from things like “capital investment” and “education levels.” In 1956, Stanford University

economist Moses Abramovitz famously stated that Solow’s finding represented “a measure of our ignorance”; and that’s basically where conventional thinking has stayed. Conventional economists still look at innovation as if it falls like “manna from heaven.” Or to put it more formally, conventional economics sees

We have a rare inversion of the typical Beltway gridlock: this time it’s the experts, not the politicians, blocking progress.

innovation as exogenous—or outside its models—and therefore outside of legitimate economic inquiry. Efforts initiated by economist Paul Romer and a few others to define innovation as “endogenous”—within economic models—are still not far along. As Harvard’s Elhanan Helpman notes in *The Mystery of Economic Growth*, “The subject of growth has proved elusive and many mysteries remain,” and the mystery of economic growth itself “has not been solved.”

It’s bad enough that conventional economists give short shrift to innovation; worse, they give short shrift to the role of government in spurring innovation. Endlessly repeating the mantra “markets are best at allocating resources,” conventional economists see government intervention as likely to hurt growth because it distorts market-based allocation. When such economists acknowledge any role for government, they envision one mostly limited to ensuring a good business climate, including protecting property rights and providing public goods like science and education. And while liberal economists want the government to intervene to spur a fairer allocation than the market will bring, they too see this as coming at price. As Alan Blinder, formerly of Bill Clinton’s Council of Economic Advisors, believes, “policy changes that promoted equity (such as making the tax code more progressive or raising welfare benefits) would often harm efficiency.” But as a liberal economist, he’s willing to sacrifice growth for fairness: “We need not

summarily reject a substantial redistributive program just because it inflicts some minor harm to economic efficiency.” In other words, conventional economists like Blinder believe that the pretax marketplace is efficient and that government policies (e.g., taxes, regulation, and spending) distort Adam Smith’s “invisible hand.”

As a result, if you are a policymaker in Congress or the White House and you want to craft policies that will lead to a 15 percent increase in per-capita GDP in 10 years, you will not only get little in the way of guidance from the conventional economics community residing at think tanks like Brookings, the American Enterprise Institute, or the Peterson Institute for International Economics or government agencies like the Congressional Budget Office, the Office of Management and Budget, or the Treasury Department. You will be told that you are on a fool’s errand. You’ll be told there is little the government can do to grow the economy in the long term, and the best you can hope for is to not take steps that would reduce the natural fixed rate of growth that the market will bring on its own. No wonder economics is called “the dismal science.”

In recent years a new theory of economic growth, innovation economics, based on an explicit effort to understand and incorporate innovation into economic models, has emerged. While far fewer in number than their neoclassical brethren, economists like Phillippe Aghion, David Audretsch, Elhanan Helpman, Richard Lipsey, Richard Nelson, and Paul Romer have made important contributions to advancing innovation economics. And while most academic departments and D.C. think tanks dealing with economics remain in the neo-classical camp, a few places, such as the Information Technology and Innovation Foundation (where I am President), the Economic Strategy Institute, the Woodrow Wilson Center, and the Council of Competitiveness, work from an innovation economics perspective.

Innovation economics reformulates the traditional model of economic growth so that knowledge, technology, entrepreneurship, and innovation are at the center and seen as the result of intentional activities by economic actors, including government; in other words, it makes innovation “endogenous” to growth models. It is guided by three key principles. First, innovation economics holds that the central focus of economics should be on growth, rather than on simply focusing, as neoclassical economics does, on managing the business cycle or ensuring an efficient allocation of resources. Because allocative efficiency revolves around the responsiveness of firms and consumers to price signals, neoclassical economists focus largely on prices and other monetary factors. In contrast, innovation economists focus more on the actual processes of production and innovation, such as trying to figure out why firms develop and adopt new technologies and what policies can spur them to do more. Thus, while neoclassical economists

tend to rely on mathematical models, innovation economics relies more on actual studies of how businesses, industries, and national economies work.

The second principle is that innovation drives growth. In some studies by innovation economists, as much as 90 percent of per capita income growth comes from innovation. In fact, innovation economists hold that the major changes of the last 15 years have occurred not because the economy accumulated more financial capital to invest in even bigger steel mills or car factories or more “human capital” (e.g., education), but because the economy developed and used a wide array of new technologies, particularly information technologies, to facilitate innovations and greater economic output.

Finally, innovation economics holds that while markets are important, left to themselves they will not produce the amount of innovation and growth that they would if supplemented by strong public innovation policies. As Oxford’s Jonathan Temple explains, the conventional model “assumes perfect competition, constant returns to scale, and the absence of externalities... All three assumptions have been questioned, often convincingly, by new growth theorists.” As such, innovation economics holds that the innovation process is rife with market failures—including the inability of firms to capture all of the benefits of their innovation activities, high levels of uncertainty, and coordination failures—and for that reason, relying on price signals and market forces alone consigns a nation to sub-optimal performance.

But until this new field takes root, we have a rare inversion of the typical explanation for Beltway gridlock: This time it’s the experts, not the politicians, who are blocking progress. Our nation would be much better off if conventional economists acknowledged publicly that this is more of an art than a science; that they don’t have all the answers; and that because of all this, policy experimentation oriented toward making the economy more innovative is the order of the day.

And while that would be a breakthrough on the order of the Keynesian economic revolution, it won’t be enough. Advancing a robust and far-reaching innovation agenda in Washington also requires that the current ideologically based political gridlock give way to a new pragmatism, with more Republicans recognizing that government has an important role to play in innovation and Democrats recognizing their redistribution agenda depends on robust innovation and growth.

For many Republicans, particularly the more conservative wing of the party, a proactive innovation policy is synonymous with heavy-handed “industrial policy” or even state socialism. Mankiw sums up the view: “Policymakers should not try to determine precisely which jobs are created, or which industries grow.

If government bureaucrats were capable of such foresight, the Soviet Union would have succeeded as a centrally planned economy. It did not, providing perhaps the best evidence that free markets are the bedrock of economic prosperity.” As a result, for many conservatives, the best innovation policy is a minimalist agenda focused on creating a favorable environment for the private sector through a clear and less burdensome tax code, limited government regulation, and a strong trade and immigration agenda.

While many Democrats support the idea of innovation policy, all too often, social issues—albeit worthy ones such as expanding health care coverage, regulating carbon emissions, protecting consumers and workers, and helping disadvantaged individuals and communities—take precedence. And when tough choices have to be made between promoting innovation and supporting redistribution, the choice is usually the latter. For example, rather than fund the America Competes Act in 2007—which authorized increased funding for science and science education—Congress increased funding for items like farm subsidies, income security, and health care. (Congress did later provide a one-time allocation of funds for it in the stimulus bill.) Moreover, all too often the inclination is not to support innovation, but to protect Americans from it by erecting regulatory and trade barriers. To be sure, it’s important to get social policies right, particularly in an era of increasing income inequality and heightened economic risk. But absent innovation policies to produce the right kinds of economic opportunities for American workers, social policies will be at best a limited backstop.

This points to the other major barrier to the development of a robust national innovation policy: money, and how we think of funds invested on innovation policy. As long as investment in innovation is seen by budget hawks in government and groups like the Concord Coalition as simply another form of spending, no different than Medicare or farm subsidies, rather than an investment that will generate growth, including future increases in federal tax revenues, it will be extremely difficult for innovation policy to make its needed claim on scarce budgetary resources. This situation has only gotten worse over the years, and is likely to worsen in the future unless a new approach is taken—namely, a national investment budget that, at minimum, allows policy makers to differentiate between spending and investment, so that the kinds of long-term investments to drive innovation can be made.

If innovation economics starts to displace conventional economics, and if our politics starts to be more amenable to a pragmatic, pro-growth position, what would we see? First, we’d see the development of an explicit national innovation strategy, like what so many other nations, including our peer competitors,

have, and which several pieces in this symposium have called for. Among its components would be a corporate tax code focused explicitly on spurring the building blocks of innovation: R&D, investment in new capital equipment, and workforce training. It would entail a significant expansion of federal funding, not just for science, but for technology as well, including co-funding industry research consortia and programs like the federal Manufacturing Extension Partnership to help firms boost their productivity, and the creation of a National Innovation Foundation.

Second, we'd see a serious process whereby proposed laws and regulations were reviewed for their impact on innovation, and hopefully revised as needed. Perhaps, as Duke Law professors Stuart Benjamin and Arti Rai have proposed, we'd see an Office of Innovation Policy within OMB to review proposed federal rules. We would see a similar institution in the Congress, akin to the CBO, to review the innovation impact of proposed legislation.

And finally, we'd see a process whereby the executive branch embeds the promotion of innovation and productivity into core policy areas like health care, energy and the environment, education, transportation, and housing and urban development; this would ensure that procurement, regulation, and government practices themselves drive innovation. For example, the Department of Transportation could take the lead on developing a national "intelligent transportation system." The Department of Energy could actively spur "green" innovation, including the smart electric grid. And Health and Human Services could prioritize medical innovation, including the transformation of health care through information technology.

The Obama Administration is taking some steps in this direction. It has created a Chief Technology Officer post in the White House to spur technological innovation, and it has supported technologies like the smart grid, greater use of information technology in health care, and expansion of broadband access in the stimulus package. But more innovation-friendly policies aren't necessarily forthcoming—not only are many of the top advisors to the president conventional economists who view such policies with lack of interest at best or opposition at worst, but the Washington economics community itself views them the same way and may criticize the president for steps in the direction of an active national innovation policy. If the country wants to retain its position as the engine of world economic growth, that can't go on. It is time Washington put innovation policy front and center. **D**