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Do We Overrate Basic Research?



Hiroko Masuike for The New York Times

Amar Bhidé, a professor at the Columbia Business School, says “midlevel innovation” is often overlooked in arguments on technology and research.

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[BARACK OBAMA](#) may have to surrender his BlackBerry when he moves into the White House, in the interests of presidential security and confidentiality. But there is every sign that his administration will pursue a pro-technology agenda.

In speeches and policy statements, Mr. Obama has repeatedly emphasized a need to maintain America’s technology leadership in the world and to invest government funds to do so. His campaign platform declared that government policy must “foster home-grown

innovation” and “help ensure the competitiveness of United States technology-based businesses.” Two of his favorite proposals — roundly endorsed by technology industry leaders and university scientists — are to double federal funding for basic research over the next several years and to train many thousands more scientists and engineers.

But such steps would likely amount to well-intentioned but misguided policies that risk doing more harm than good, according to Amar Bhidé, a professor at the Columbia Business School. In a new book, “The Venturesome Economy” (Princeton University Press), Mr. Bhidé makes a detailed argument that contradicts the prevailing view of expert panels and authors who contend that the nation’s prosperity is threatened by the technological rise of China and India, and that America’s capacity for innovation is eroding. To arrest the decline, they insist that more scientists and engineers, and more government spending on research, are sorely needed.

Mr. Bhidé derides the conventional view in science and technology circles as “techno-nationalism,” needlessly alarmist and based on a widely held misunderstanding of how technological innovation yields economic growth. In his view, many analysts put too much emphasis on the production of new technological ideas. Instead, he observes, the real economic payoff lies in innovations in how technologies are used.

America’s competitive advantage, Mr. Bhidé explains, resides mainly in its creative use of information technology, especially in the large and growing services sector, led by companies like [Wal-Mart](#).

“Wal-Mart and its followers are as much a part of the technological success of America as Silicon Valley,” he said.

The globalization of science and technology research, Mr. Bhidé added, should actually work to the advantage of the United States economy, so long as America remains the best place to commercialize inventions. As the rest of the world becomes a richer source of inventions, there is less need for the United States to come up with such a large share itself — and policy, he says, should reflect that reality.

“I’m not arguing for reductions in research spending in the United States,” he said. “But in a world where investment in high-level science and technology is increasing, there is no compelling reason to invest a lot more.”

The flaw in Mr. Bhidé’s thesis is that it amounts to a “false choice,” said Robert D. Atkinson, president of the Information Technology and Innovation Foundation, a nonpartisan research group. Most of the economic gains from technology, Mr. Atkinson agrees, do come from its innovative use. “But that doesn’t mean that the basic research is not critical,” he said.

In fast-moving fields, Mr. Atkinson said, there are immense benefits from the knowledge produced in research projects quickly spilling over into ventures that become powerhouses in new industries. [Google](#), which grew out of a digital library project

funded by the [National Science Foundation](#), is among a host of such examples. Where the invention is done, Mr. Atkinson notes, is often vital.

Yet, Mr. Bhidé argues, policy choices and tradeoffs have to be made, and they should be guided by a deeper understanding of how innovation, in all its forms, contributes to economic growth. That analysis, conducted over the last six years, is the basis of his 508-page book, which adds to the emerging field of “innovation economics.”

His research builds on, but is also critical of, the doctrine of “new growth theory,” developed in the 1980s and ’90s. That theory holds that new ideas are the key engine of growth and presents mathematical models, created by economists like Paul M. Romer of Stanford, to simulate the process. The models have been used to justify increasing government subsidies for research.

But what the math models do not — and cannot — capture, Mr. Bhidé writes, is “all the various forms of knowledge generated by the massively multiplayer innovations game that sustains economic growth.”

What gets short shrift, Mr. Bhidé said, is “midlevel innovation.” The category, by his definition, is a broad one, ranging from a venture capitalist tweaking a business model to trim costs by a few percent to a technician fine-tuning his company’s business software to save a couple of data-entry steps in the accounting department.

These midlevel innovations, Mr. Bhidé said, do not show up in patent counts, and individually they are small steps indeed. But they add up, especially because there is so much of that kind of unsung innovation across the American economy.

While others bemoan the state of American education, Mr. Bhidé, who graduated from the elite Indian Institute of Technology in Mumbai before he earned advanced degrees at [Harvard](#), is impressed with the general level of creativity and practical skills across the nation’s work force.

Every day, for example, millions of workers are using spreadsheets to do simple what-if calculations to improve some process or operation in their businesses, he said. “In the end, it comes down to individuals, and you don’t need to be a trained scientist or engineer for this broad swath of creatively productive work,” he observed. “You need a somewhat more open mind, a willingness to experiment and to innovate in the use of technology, not create it.”

So instead of tilting policy toward the apex of the education system, Mr. Bhidé suggests, it may make more sense to invest scarce government resources further down — say, in upgrading community college programs. “The modern information technology economy is going to need a lot of foot soldiers,” he said.

“And our supply of high-level science and ideas in most fields far exceeds our capacity to use it.”

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