The creative state

By Mariana Mazzucato
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The conventional view in mainstream economics today is that governments have little capacity to spark innovation. The state should play as limited a role in the economy as possible, the thinking goes, intervening only in cases of "market failure." This is far from the truth.

In fact, governments can and do play a critical role in spurring innovation – actively creating new markets, instead of just fixing them. To be sure, advocates of a limited economic role for government believe that market failure justifies some funding of infrastructure and basic science. But such limited intervention can hardly explain the billions of public-sector dollars that have flowed toward downstream applied research, even providing early-stage financing for companies. Indeed, in some of the world's most famous innovation hubs, the state has played a key "entrepreneurial" role, envisioning and financing the creation of entire new fields, from information technology to biotech, nanotech, and green tech.

In Silicon Valley, for example, the government has acted as a strategic investor through a decentralized network of public institutions: The Defense Advanced Research Projects Agency, NASA, the Small Business Innovation Research program (SBIR), and the National Science Foundation.

The sums involved can be staggering, and not just in IT; large amounts of funding have also been channeled to energy and life sciences. In 2011, for instance, the US National Institutes of Health (NIH) invested $31 billion in biomedical research. Marcia Angell, a professor at Harvard Medical School, has shown that this financing played a crucial role in the development of some of the most revolutionary new drugs in recent decades. Similarly, for some of the most innovative American companies, financing from the SBIR has proved to be more important than private venture capital.

Examples outside the US include Israel, where the public venture-capital fund Yozma has provided early-stage funding to some of the country's most dynamic companies, and Finland, where Sitra, the public innovation fund, supplied early financing for Nokia. In China, the state-owned development bank is offering billions of dollars in loans to some of the country's most innovative companies, including Huawei and Yingli Solar.

These types of public investments are critical in creating and shaping new markets. Indeed, government investment played a central role in developing nearly all of the technologies that make the iPhone a smart phone: the Internet, GPS, touchscreens, and the advances in voice recognition underlying Siri. Similarly, in many countries, it is the public sector that is leading the way in making green technology possible.

Recognizing the importance of government investment in promoting innovation and growth implies the need to rethink the conventional wisdom about state intervention. Instead of focusing on picking individual technologies or firms, public organizations should act like investors, betting on a diversified "portfolio" of choices.

Like any other investor, the state will not always succeed. In fact, failure is more likely, because government agencies often invest in the areas of highest uncertainty, where private capital is reluctant to enter. This means that public organizations must be capable of taking chances and learning from trial and error.

If failure is an unavoidable part of the innovation game, and if government is crucial for innovation, society must be more tolerant of "government failure." But the reality is that when government fails, there is public outcry – and silence when it succeeds.

For example, the bankruptcy of the US solar energy firm Solyndra, which received a $500 million government-guaranteed loan, triggered partisan protests. Yet few have paused to consider that the government provided nearly the same amount to Tesla to help it develop the Tesla S car, a product that is considered an archetype of Silicon Valley innovation.

What, then, might make the public more accepting of government failure?

Private venture capitalists cover their losses from failed investments with their profits from those that succeed; but government programs are rarely set up to generate significant returns. While some argue that the government's return comes through taxes, the current tax system is not working, owing not only to loopholes, but also to rate reductions. When NASA was founded, the top marginal tax rate was over 90%. And capital gains tax has fallen by more than 50% since the 1980s.

In order to build support for public investment in higher-risk innovation, perhaps taxpayers should receive a more direct return, by channeling profits into a public innovation fund to finance the next wave of technologies. When investments are in upstream basic research, the spillover effect across industries and sectors is sometimes enough of a social reward. But other cases might require creating alternative incentives.

For example, some of the profits from the government's investment in Tesla could have been recovered through shares (or royalties), and used to cover the losses from its investment in Solyndra. Repayment of public loans to business could be made contingent on income, as student loans often are. And the prices of drugs that are developed largely with NIH funding could be capped, so that the taxpayer does not pay twice.

One thing is clear: the current approach suffers from serious shortcomings, largely because it socializes the risks and privatizes the rewards. This is hurting not only future innovation opportunities, but also the government's ability to communicate its role to the public. Acknowledging the role that the state has played – and should continue to play – in shaping innovation enables us to begin debating the most important question: What are the new visionary public investments needed to drive future economic growth?

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