

**The Paradox of Innovation: Political Influence, Government Subsidies,
and Unequal Spillovers**

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Abstract

This paper examines the paradoxical role of political measurements in accelerating or impeding indigenous technological innovation. State-led support can accelerate development under certain circumstances, but it often leads to market failures through the misallocation of resources. Additionally, even though some indigenous technological inventions generate long-term spillovers, they are often the least profitable to firms and therefore end up hindering technological growth through underinvestment and lack of support. To solve this problem, governments should target subsidies to spillover-rich industries instead of concentrating investment on politically linked firms. An analysis of China's tendency to subsidize more firms connected to the party-state reveals how such policies can involuntarily limit long-term growth. This paper concludes that redirecting subsidies is crucial and that it is an optimal way to maximize shared benefits.

Introduction

Political measures like sanctions, trade wars, tariffs, and domestic industrial policies may hinder indigenous technological innovation or, in some cases, accelerate it. Yet in spite of rapid technological advancements, innovation and R&D resources can be misallocated, and politically driven innovation may boost certain firms while leaving the broader economy less dynamic (Akcigit, Baslandze, and Lotti). Some indigenous technological inventions do generate long-term spillovers—indirect benefits businesses gain from technological support given to another firm—benefiting the overall economy (Sung, Zhang, and Park). Rather than focusing on the speed of

advancements per se, policies should prioritize steering them away from unequal access to political influence and market inefficiency and toward maximizing spillovers and shared benefits. This paper will examine the paradox of innovation by exploring how politics can misdirect resources, using the case of China's politically connected firms to demonstrate the problem and propose targeted subsidies as a potential solution. Like the concept of velocity in physics that measures the speed of an object together with its direction of motion, sustainable growth is determined not only by 'more' or 'rapid' innovation but by the balancing of speed with direction.

The Paradox of Innovation

The number of industrial policies used by advanced economies has surged as they seek to boost innovation, and various countries are building up their domestic industries in areas like green technologies and advanced semiconductors (Fleming and Bounds). However, given that industrial policy is still prone to policy mistakes, projects can often entail high fiscal costs and negative cross-border spillovers if not carefully designed, even when they do transform industries (International Monetary Fund). Because knowledge spillovers reduce private incentives, a major problem is that firms tend to underinvest in those spillover-rich innovations unless properly supported. As Aghion and Jaravel note (2015), while innovation creates positive externalities, those spillovers can also diminish firms' incentives to invest in R&D, as the returns to innovation cannot be fully appropriated. The paradox is that technological innovations that deliver the greatest public value frequently hold the weakest private incentives for firms and, hence, do not attract enough private investors. In order to boost innovation and productivity without causing harm, governments may need to intervene and provide well-targeted support in

public research and R&D (Fleming and Bounds). Moreover, the interventions should be carefully designed to promote spillover-rich innovation rather than elite capture, since rent-seeking, corruption, and political capture can all result in welfare losses (Cherif et al.). This trade-off between government intervention and the risk of inefficiency can be clearly seen in international competitions for technological leadership. For example, the U.S.-China rivalry over high-performing AI chips can highlight how state-led support may drive innovation within the nation while simultaneously influencing internal policy choices that exclude broader societies.

Innovation and Political Connections: Examples from China

On the face of it, it may seem that blocking China from accessing high-performing AI chips could help the U.S. maintain global leadership. Some argue that restricting sales could block China from accessing the AI data center computing power it needs to compete effectively, thereby securing America's status as the global AI leader. But U.S. restrictions on AI chips will likely push China to invest in growing its own capacity. For instance, Huawei's enormous progress in recent years has left it with the expertise and funding needed to invest heavily in AI. The investments Huawei is already making would only increase in response to the expanded market opportunities within China and abroad created by the sanctions (Villasenor). This kind of state-led support can generate rapid innovation and important spillovers, as governments often implement policies such as subsidies, tariffs, and trade restrictions for the purpose of acceleration.

However, the benefits of such state-driven policies are not distributed evenly. Studies suggest that certain politically connected firms in China's AI sector are more likely to secure government

support, subsidies, contracts, and favorable treatment over the most innovative (Low). This can lead to rent-seeking behavior, which pushes firms to focus more on exploiting political connections rather than on innovation (Cheng & Li). To exemplify, SenseTime, one of China's flagship AI companies, was capable of scaling its operations and achieving a valuation of over \$7.5 billion with robust government support like generous subsidies. Yet, SenseTime's stock price has since plummeted, highlighting how political incentives can inflate valuations and sustain firms regardless of their actual market strength (Low). Additionally, data demonstrates that China grants more subsidies to manufacturing firms more connected to the party-state, and that the positive effects of subsidies on local manufacturing growth and on firm-level productivity tend to decrease (Lee). Here the paradox deepens: spillover-rich innovations, which already lack private incentives, continue to be underinvested, while politically connected firms continue to capture excess resources.

Target subsidies to spillover-rich industries

In addressing this paradox, states should redirect subsidies toward sectors with knowledge spillovers rather than politically allocated subsidies. Since innovations with the greatest public impact and the highest knowledge spillovers are often the least profitable, firms have little incentive to invest in them.

A government seeking to invest in innovation support programs must account for these positive spillovers—the indirect benefits gained by other firms and society from an innovation—when making decisions. If spillovers are positive but are excluded from any assessment, the returns to the investment will be underreported, leading to underinvestment, a form of market failure where

resources are not allocated efficiently. The presence of positive innovation spillovers provides a rationale for increased government intervention, which is necessary to correct this underinvestment and achieve optimal social welfare outcomes (Medhurst et al.).

One way to achieve this is by targeting subsidies to spillover-rich industries. By helping businesses reduce the costs and risks of technological innovation, subsidies can close the return on investment gap between society and private firms and relieve financial pressure. Studies show that government-subsidized businesses typically have high technological content, strong overall strength, favorable development prospects, and an improved ability to attract investors (Ding et al.).

Conclusion

This essay has shown that political measures like state subsidies and industrial policies play a paradoxical role in shaping indigenous technological innovation. They can either impede progress by misallocating resources and favoring politically connected firms or accelerate it by supporting socially valuable innovations overlooked by investors. This view is further justified by professionals like Era Dabla-Norris, the deputy director of the IMF's fiscal affairs department, who states that "using industrial policy to promote innovation was only worth it if the benefits could be well identified and measured, and the subsidies were provided to sectors that generated higher knowledge spillovers to other sectors" (Elliott). In short, it is not political intervention itself that determines innovation, but whether such measurements encourage and advance firms that are capable of producing long-term, spillover-rich innovation within the country.

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