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Article

The Entrepreneurial State: Rethinking Its Role in Driving Innovation Policy

Ou Hai [1,*]

[1] Beijing Union University, Beijing, 100101, China
* Correspondence: Ou Hai, Beijing Union University, Beijing, 100101, China

Abstract: This article comprehensively explores the role of government in fostering innovation in key technologies and sectors, combining two opposing perspectives presented in The Entrepreneurial State and The Myth of the Entrepreneurial State. The Entrepreneurial State emphasizes the government's active role in the innovation process, particularly in the early stages of high-risk R&D, where the government acts not only as a funding provider but also as a policymaker, supporting market-driven innovation. Conversely, The Myth of the Entrepreneurial State highlights the central role of markets and individuals in economic development and technological progress, arguing that the government's role should be limited to creating a favorable environment for innovation. Integrating the content of both perspectives, this text begins by reviewing the government's role in promoting modern innovation from two aspects: the objectives of government-led innovation promotion and the role it plays in the process of innovative activities. The government no longer directly leads innovation development but instead serves as a supportive actor, while the true driving force behind innovation stems from the creativity and exploratory spirit of individuals.

Keywords: Entrepreneurial State; innovation policy; government role in innovation; public R&D investment

1. Introduction

Innovation is the central driving force behind social and economic development, where the government plays a significant role in fostering meaningful advancements. However, in recent years, the innovation model has undergone significant changes. In the post-World War II period, governments encouraged innovation by directly conducting research and development activities or providing targeted funding for R&D. While this model still exists, today, this linear pathway to innovation has become increasingly rare.

This shift is due to the growing complexity and interconnectedness of the world, marking the advent of the era of ecosystem innovation. In this complex system, the role of government must be adjusted accordingly, shifting its focus toward creating an environment that promotes innovation across various industries, academia, and other fields.

2. Literature Review

Government formulation of innovation policies, along with its support and participation in innovation activities, plays a crucial role in promoting innovation. Studies generally argue that market mechanisms have inherent deficiencies that require government intervention in innovation activities to address market failures in resource allocation for innovation. Hong et al. and Greco et al., among others, point out that the government directs and participates in the research and development of fundamental knowledge and common technologies, creating a favorable knowledge environment for companies to engage in commercial and practical R&D activities, thereby enhancing regional innovation efficiency [1,2].

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Market mechanisms struggle to address the externalities of technological innovation outcomes, making it difficult for companies, industries, and even entire regions to achieve optimal levels of investment in technological innovation. Government support helps motivate microeconomic agents to increase their innovation investment intensity, improving the efficiency and scale of innovation activities. Government subsidies are an important means by which governments internalize the externalities of innovation activities conducted by entities such as firms. They promote technological innovation in enterprises by incentivizing them to strengthen research and technological development [3].

The externality characteristics of corporate R&D activities and the improvement of efficiency, combined with the natural weakness of market mechanisms in addressing externality problems, result in an intrinsic reliance of enterprises on government power during the transformation process. Government subsidies can adequately compensate for market mechanism deficiencies, constructing a dual-path resource allocation model of "market mechanism + government." This approach addresses the externality challenges faced by companies in their development through multidimensional solutions, such as institutional arrangements and financial subsidies. By internalizing the externalities of companies' innovation and operational activities, these measures effectively mitigate the shortcomings of market mechanisms and enhance incentives for corporate R&D [4].

However, some studies suggest that government innovation policies or support for innovation activities have limited effects on promoting innovation and could, in certain cases, lead to challenges in the development of innovative activities. Research by Pata Nakul and Pinto and Wang et al. indicate that factors such as corruption or political connections can influence government involvement in innovative behavior [5,6]. While government policies can have a positive impact on innovation, they may also unintentionally create barriers to market competition, potentially leading to bureaucratic delays and inefficient interventions that do not benefit the effective development of innovation activities.

For example, in the process of selecting entities for subsidies, companies with stronger networks or better alignment with government priorities may obtain grants more easily, while some innovative entities in need of support might not receive adequate resources. This could lead to an inefficient allocation of technological resources, potentially reducing the overall impact of subsidies on innovation and regional development. Factors such as the public nature of government subsidies, limited oversight mechanisms, discrepancies between subsidy intentions and business innovation goals, and delays in policy implementation may affect the effectiveness of subsidies. These issues highlight the importance of optimizing subsidy mechanisms to better align with innovation objectives and enhance regional innovation efficiency.

Regarding whether the government should participate in innovation activities or the effectiveness of government innovation policies, the existing literature presents two completely opposing viewpoints, both of which provide certain theoretical explanations. However, previous research on government participation in regional innovation activities has been overly vague, lacking detailed classifications of different methods of government involvement and failing to propose a reasonable and effective mechanism for discussion.

With respect to the government's role in the innovation system, existing literature has only provided a general macro-level explanation, without detailing the different roles and functions of the government or its mechanisms of impact on innovation activities. Exploring the effects of government participation in innovation activities should not be limited to superficial questions such as "should the government participate?" or "is participation effective?" but should delve deeper into "why government participation is ineffective" and "how participation can be made effective."

3. Discussion

In *The Entrepreneurial State*, Mariana Mazzucato emphasizes the critical role of government in driving innovation in key technologies and sectors, particularly during the

early stages of research and development, which are high-risk and require significant investment [7]. Through direct investments in basic research, the establishment of innovation funds, and the implementation of related policies, the government provides the necessary funding and support for market innovation, especially in areas where commercial investors might hesitate due to high risks. In this process, the government's role extends beyond the traditional remedy for "market failure"; through active intervention and investment, it becomes an active participant and promoter in the innovation process [8]. However, this does not imply that the source of innovation originates entirely from the government.

Conversely, the book *The Myth of the Entrepreneurial State* offers an opposing perspective, highlighting the central role of market forces and individual innovative spirit in driving economic development and technological progress [9]. The author, through an analysis of various historical cases and modern economic data, argues that in an open and competitive market environment, the free exploration and competition of individuals and companies are the true driving forces behind innovation and progress [10,11] The government's role should be to create a favorable legal and policy environment for innovation rather than directly participating in market competition or attempting to steer the direction of innovation.

4. Conclusion

Even in government-led innovation processes, the contributions of individual scientists, engineers, and entrepreneurs are indispensable. They transform government funds and resources into real technologies and products, acting as the bridge between theory and practice, between dreams and reality [12]. While the government plays a significant role in innovation policies and financial support, the true source of innovation lies in individuals.

Joseph Schumpeter introduced the concept of creative destruction to describe the critical role of innovation in the development of capitalist society. Schumpeter viewed innovation as constructing a new production function or introducing a combination of production factors and conditions never seen before into the economic system, driving economic benefits and growth [13]. He regarded the entrepreneur as the key agent of innovation, giving unprecedented attention and value to their role. Schumpeter emphasized the importance of entrepreneurs in fostering innovation and, consequently, in advancing capitalist society. The entrepreneurial spirit, characterized by persistent self-improvement and the pursuit of individual value, is the fundamental force behind innovation. Innovation is the soul of entrepreneurship, and entrepreneurs are the soul of capitalism [14,15].

4.1. Government Strategies to Foster Innovation

Government strategies to promote innovation do not necessarily result in increased efficiency in innovation. The scientific basis of certain governmental strategies remains debatable. For instance, in Russia, the importance of artificial intelligence for the future during an online speech in September 2017, declaring that the country leading this field would dominate the world. However, Putin demonstrated evident disinterest and even aversion toward the civilian and economic applications of new technologies, preferring to concentrate national investments in military science and technology. This preference, rooted in the Soviet tradition of scientific research, reflects a misunderstanding of the essence of 21st-century national security.

In today's global environment, a nation's security is no longer solely based on military power but on its innovation and global competitiveness in civilian, military, and dual-use technologies.

Even when the government has an absolute advantage in economic system information and can rapidly process economic signals, its decision-making is constrained by its knowledge, ability to interpret information, and accuracy in processing it. As a result,

government officials often struggle to make decisions from the perspective of frontline managers in technological development and production. The formulation and implementation of government strategies may suffer inefficiencies due to internal and external factors, negatively impacting the effectiveness of innovation activities. Government strategies are also limited by administrative efficiency and specialized knowledge constraints, resulting in significant delays compared to market developments [16].

4.2. Government Participation in Innovation Activities

Public spending is the primary means by which governments participate in innovation activities, but such spending is prone to rent-seeking behavior. Companies that obtain government subsidies through rent-seeking may inhibit innovation efficiency.

1) Displacement of Innovation Investment: Rent-seeking activities directly divert corporate investment from innovation, as companies may allocate resources originally intended for R&D to bribe government officials to secure subsidies. This increases innovation costs and reduces efficiency. Rent-seeking changes the competitive dynamic among firms, shifting competition from price and innovation to rent-seeking, distorting investment behavior and suppressing innovation preferences.
2) Misallocation of Government Resources: Rent-seeking may distort government spending behavior, enabling low-efficiency firms to secure more subsidies, while high-efficiency firms struggle to access government support. This misallocation of innovation resources reduces overall innovation efficiency.

Additionally, government support for private R&D can distort incentives, displacing investment by innovators. While government support may increase the scale of innovation in firms or regions, it has limited impact on improving the efficiency of innovation activities. The divergence in motivations between governments and innovators further inhibits the effectiveness of government support. Governments typically aim for the social benefits of technological innovation, favoring long-term and strategically impactful R&D. However, these investments often fail to yield short-term results and benefits, manifesting as low short-term efficiency of government support.

During the COVID-19 pandemic, government support for innovative small and medium-sized enterprises (SMEs) showed significant discrepancies [17]. Studies indicate that support mechanisms often reach companies that could survive without assistance (a "deadweight effect") and sometimes sustain inefficient firms ("displacement effect"). These effects hinder the creative destruction necessary for economic renewal and innovation.

4.3. Reevaluating the Government's Role in Modern Innovation

From virtual assistants and jet engines to the internet, governments have historically driven groundbreaking innovations with profound impacts beyond the public sector. While these innovations were initially government-funded, their true value emerged when the commercial sector adopted and widely disseminated the technologies.

Innovation often requires collaboration across multiple fields and participants. Its non-linear nature suggests that modern innovation results from iterative cycles of scientific discoveries, engineering knowledge, marketing strategies, and financial support. These four elements are critical to the successful implementation of innovation.

However, no single entity needs to undertake all these roles. Different actors can contribute in various capacities. For instance, major breakthroughs in R&D may originate from academia, the commercial sector, or the government. The transistor was developed at Bell Labs through commercial R&D; low-power display technology that drove e-reader development emerged from academic research at MIT; and voice-controlled intelligent assistants like Siri were supported by government-funded work from the Defense Advanced Research Projects Agency (DARPA).

The ability of actors to play multiple roles further complicates the situation. Academic researchers can also act as entrepreneurs, developing products and exploring markets.

As the number of participants increases and the innovation ecosystem becomes more complex, the effectiveness of direct government investment in R&D gradually diminishes. Governments, therefore, increasingly rely on indirect tools such as tax incentives and loan guarantees. These tools are particularly attractive to government leaders as they can effectively shape market behavior without requiring significant upfront costs.

As a result, the government's role increasingly shifts to that of a facilitator, focusing on creating an environment that fosters innovation across industries, academia, and other sectors. The government no longer directly leads innovation development but instead serves as a supporter.

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