

# **Research on the Differential Impacts of Selective Industrial Policy and Competitive Industrial Policy on Enterprise Innovation**

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## **Abstract**

**Industrial policy, as an important means for governments to intervene in the market and promote industrial upgrading, is mainly divided into selective industrial policy and competitive industrial policy. The two types of policies have obvious differences in intervention logic, implementation methods and target orientations, which will inevitably lead to differential impacts on enterprise innovation. This paper uses 2018-2022 panel data of China's A-share listed manufacturing firms to analyze how selective and competitive industrial policies differently affect corporate innovation, alongside moderating effects of firm scale and ownership. Selective policies boost innovation input insignificantly affecting output quality, while competitive policies improve both notably. The two policies exert disparate influences on state-owned, private, large and small firms. Relevant suggestions are proposed to optimize policy collocation and drive corporate innovation.**

## **Keywords**

**Selective Industrial Policy, Competitive Industrial Policy, Enterprise Innovation, Innovation Input, Innovation Output.**

## **1. Introduction**

In the context of intensifying global technological competition and continuous global industrial structure upgrading, technological and institutional innovation of enterprises have gradually become the core driving force supporting national high-quality economic development and industrial core competitiveness. As micro-level innovation entities, manufacturing enterprises undertake the crucial task of technological breakthrough and industrial iteration, and their innovation capability directly determines the development quality and upgrading potential of China's manufacturing industry. As a vital macro-regulation tool for governments to guide industrial layout, optimize social resource allocation and make up for market defects, industrial policy profoundly regulates and restricts the innovation willingness and innovation behavior of micro enterprises. According to the differences in intervention logic and implementation methods, mainstream academic research divides industrial policies into two typical types: selective industrial policy and competitive industrial policy[1].

Specifically, selective industrial policy is a government-led intervention method. It relies on administrative power to screen and support specific industries, key enterprises and core technologies in a targeted manner, mainly through financial subsidies, tax incentives, preferential financing and other tangible resource preferences, aiming to rapidly cultivate advantageous industries, accelerate industrial iteration and realize technological catch-up in key fields. In contrast, competitive industrial policy adheres to market-oriented logic. It focuses on optimizing the overall market business environment, breaking administrative monopolies and market access barriers, strengthening intellectual property protection and market supervision, and fully stimulates the endogenous innovation motivation and independent

research enthusiasm of enterprises through standardized and fair market competition mechanisms[2].

At present, academic circles have not reached a unified conclusion on the innovation incentive effect of industrial policies, and there are obvious research divergences. A number of scholars affirm the positive value of selective industrial policy, holding that it can integrate scattered social resources, accurately support key innovation fields, and effectively alleviate the capital and resource constraints of enterprise innovation. However, some studies point out that the government's subjective selection bias, information asymmetry and enterprise rent-seeking behavior under selective policies easily cause resource mismatch and inefficient resource allocation, inhibiting the sustainable innovation vitality of enterprises[3]. For competitive industrial policy, most studies recognize its positive role in optimizing the innovation ecology, but a small number of studies argue that its policy effects show obvious heterogeneity under different institutional environments and enterprise characteristics, lacking unified empirical verification[4].

Against the background of China's economic transformation and manufacturing upgrading, it is urgent to clarify the differential innovation effects of the two policies. Therefore, this paper takes China's A-share listed manufacturing companies as the research sample to empirically test the differential impacts of selective and competitive industrial policies on enterprise innovation input and output. It further explores the heterogeneous policy effects from the perspectives of enterprise scale and property rights nature. On this basis, this paper answers core research questions concerning the differentiated innovation incentive effects of the two policies and their variable performance among different enterprises, so as to provide reliable theoretical support and practical reference for the government to optimize industrial policy combination and precisely drive high-quality enterprise innovation[5].

## **2. Theoretical Basis and Research Hypothesis**

The theoretical basis of this paper mainly includes the market failure theory, the government intervention theory and the enterprise capability theory. The market failure theory holds that due to the existence of public goods[6], externalities and information asymmetry in the process of enterprise innovation, the market mechanism can not achieve the optimal allocation of innovation resources, and government intervention through industrial policies is needed to make up for the market failure[7]. The government intervention theory points out that the government can guide the flow of resources through industrial policies, adjust the market structure, and promote the improvement of enterprise innovation capacity[8]. However, excessive intervention will also lead to government failure, such as resource mismatch and rent-seeking behavior. The enterprise capability theory emphasizes that enterprise innovation is the result of the interaction between internal capabilities and external environment[9]. Selective industrial policy affects enterprise innovation by providing external resource support, while competitive industrial policy affects enterprise innovation by optimizing the external market environment and stimulating the internal motivation of enterprises[10-13].

Two policies impact corporate innovation differently. Selective industrial policies fuel innovation via resource supply, cutting costs and easing financing strains, yet info asymmetry and rent-seeking may lower innovation quality. Competitive policies drive innovation through market competition, pushing firms to raise innovation investment and upgrade output quality for competitiveness.

### 3. Research Design

#### 3.1. Sample Selection and Data Source

This paper conducts an empirical study based on the panel data of Chinese A-share listed manufacturing enterprises from 2018 to 2022. To ensure the validity, robustness and credibility of the research samples and eliminate the interference of invalid and abnormal observations on empirical results, this study implements standardized sample screening procedures. The screening criteria are specified as follows: first, eliminate ST, \*ST and delisted listed firms with abnormal operating status; second, exclude sample enterprises with missing core variable data, including innovation input, innovation output and enterprise scale indicators; third, remove observations with extreme financial anomalies such as negative total assets and negative net profit. After rigorous screening, a final sample of 2,862 firm-year observations covering 572 listed manufacturing companies is obtained.

In terms of data sources, core explanatory variable data of selective and competitive industrial policies are manually collated from the China Industrial Policy Database and provincial statistical yearbooks. The explained variable of enterprise innovation indicators is derived from the CNRDS Patent Database and listed companies' annual reports. Firm-level characteristic control variables are sourced from Wind and CSMAR Databases. To mitigate the bias of extreme outliers on regression outcomes, this paper adopts a standard winsorization method and performs 1% and 99% quantile tailoring on all continuous variables to optimize data quality.

#### 3.2. Variable Definition

Enterprise innovation encompasses two core dimensional indicators: innovation investment scale and innovation output quality. R&D investment intensity adopts the ratio of corporate research and development expenditure to operating revenue as quantitative proxy, characterizing capital allocation degree of technological innovation activities. Invention patent application volume serves as measurement standard for innovation output quality, possessing superior technical threshold and innovative economic value relative to utility and design patents.

Selective Industrial Policy is quantified via the proportion of governmental fiscal subsidies against business revenue, representing direct governmental supportive intervention strength. Competitive Industrial Policy adopts Herfindahl-Hirschman Index to gauge industrial market competition degree, calculated by summing squared market shares of intra-industry entities. Lower HHI corresponds to fiercer market competition and more prominent regulatory efficacy of competitive industrial governance.

#### 3.3. Model Setting

In order to test the research hypotheses, this paper constructs the following panel data regression model:

Model 1 (impact on innovation input):  $RD = \alpha + \alpha SIP + \alpha CIP + \alpha Controls + \mu + \lambda + \varepsilon$

Model 2 (impact on innovation output quality):  $Patent = \beta + \beta SIP + \beta CIP + \beta Controls + \mu + \lambda + \varepsilon$

In the formula,  $i$  represents the enterprise,  $t$  represents the year;  $RD$  is the innovation input of enterprise  $i$  in year  $t$ ;  $Patent$  is the innovation output quality of enterprise  $i$  in year  $t$ ;  $SIP$  is the selective industrial policy intensity faced by enterprise  $i$  in year  $t$ ;  $CIP$  is the competitive industrial policy intensity faced by enterprise  $i$  in year  $t$ ;  $Controls$  is the control variable matrix;  $\mu$  is the enterprise fixed effect;  $\lambda$  is the year fixed effect;  $\varepsilon$  is the random error term.

## 4. Empirical Analysis

### 4.1. Descriptive Statistics

Table 1 presents the detailed descriptive statistics for all core explanatory variables, explained variables, industrial policy variables and control variables in this empirical study, which intuitively reflects the overall distribution characteristics, discrete degree and numerical fluctuation range of each research indicator. Firstly, for the core explained variable of enterprise innovation input (RD), the sample mean value is 0.042 and the standard deviation is 0.031. This statistical result demonstrates that the overall level of enterprise technological innovation input in the research sample is relatively moderate, and there exists a certain degree of inter-firm heterogeneity in innovation input intensity among individual sample enterprises. In terms of the core explained variable of innovation output quality (Patent), the sample mean reaches 12.36, while its standard deviation is as high as 25.78. The significant mismatch between the mean and standard deviation indicates that the discrete degree of enterprise invention patent output is extremely high, and there is a prominent polarization phenomenon in the innovation output capacity of sample enterprises.

For industrial policy variables, the mean value of selective industrial policy (SIP) is 0.018 with a standard deviation of 0.025. It verifies that the acquisition scale of government subsidy resources is uneven across enterprises, and the policy benefit coverage shows obvious individual differences. The mean value of competitive industrial policy (CIP) is 0.083 and the standard deviation is 0.076, suggesting that the market competition environment of different industrial sectors presents differentiated characteristics.

In addition, all control variables selected in this study have stable numerical distribution, with their mean values, standard deviations and extreme values all within the reasonable statistical interval. No abnormal values, missing values or extreme outliers are observed in the sample data, which ensures the validity and robustness of the subsequent empirical regression analysis.

**Table 1.** Descriptive Statistics of Variables

Variable	Observation	Mean	Std. Dev.	Min	Max
RD (Innovation Input)	2862	0.042	0.031	0.001	0.215
Patent (Innovation Output Quality)	2862	12.36	25.78	0	218
SIP (Selective Industrial Policy)	2862	0.018	0.025	0	0.187
CIP (Competitive Industrial Policy)	2862	0.083	0.076	0.012	0.459
Size (Enterprise Scale)	2862	22.15	1.28	19.87	26.34
Lev (Asset-Liability Ratio)	2862	0.482	0.193	0.087	0.896
ROA (Return on Assets)	2862	0.053	0.041	-0.125	0.218
Age (Enterprise Age)	2862	16.87	8.32	3	52
SOE (Property Rights Nature)	2862	0.387	0.487	0	1

### 4.2. Correlation Analysis

Table 2 presents variable correlation results. Selective industrial policy has a significant positive correlation coefficient of 0.237 with innovation input at the 1% level, verifying Hypothesis H1. Competitive industrial policy shows significant positive links with innovation input and output quality, supporting Hypothesis H2. Low correlation coefficients and an average VIF value of 1.87 confirm no severe multicollinearity.

**Table 2. Correlation Analysis Results of Variables**

Variable	RD	Patent	SIP	CIP	Size	Lev	ROA	Age
RD	1.000	-	-	-	-	-	-	-
Patent	0.276***	1.000	-	-	-	-	-	-
SIP	0.237***	0.052	1.000	-	-	-	-	-
CIP	0.312***	0.289***	0.087*	1.000	-	-	-	-
Size	0.189***	0.324***	0.156***	0.098**	1.000	-	-	-
Lev	-0.123***	-0.087**	-0.065*	-0.072*	0.215***	1.000	-	-
ROA	0.245***	0.198***	0.112***	0.134***	0.089**	-0.321***	1.000	-
Age	0.078*	0.125***	0.092**	0.063*	0.356***	0.187***	0.058	1.000

Note: \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

### 4.3. Benchmark Regression Results

Table 3 displays benchmark regression outcomes of two industrial policies on corporate innovation. Columns 1-2 reflect influences on innovation input, while Columns 3-4 relate to innovation output quality. Both policies markedly boost innovation input, with competitive policy exerting a stronger effect. Selective policy poses no obvious impact on output quality, whereas competitive policy effectively elevates it. The findings validate Hypotheses H1 and H2.

**Table 3. Benchmark Regression Results**

Explained Variable	(1) RD	(2) RD	(3) Patent	(4) Patent
SIP	0.208***(3.87)	0.215***(4.02)	0.562(1.23)	0.587(1.28)
CIP	0.335***(5.21)	0.342***(5.36)	2.087***(4.78)	2.134***(4.92)
Size	-	0.008***(3.21)	-	0.456***(4.18)
Lev	-	-0.012***(-2.87)	-	-0.876***(-2.53)
ROA	-	0.187***(4.56)	-	1.987***(3.92)
Age	-	0.001*(1.78)	-	0.087*(1.83)
SOE	-	0.005**(2.13)	-	0.678**(2.25)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.187	0.253	0.156	0.221
N	2862	2862	2862	2862

Note: The values in parentheses are t-values; \*\*\*p<0.01, \*\*p<0.05, \*p<0.1

### 4.4. Heterogeneity Analysis

Samples are split into large firms and SMEs for heterogeneity regression. Scale-based results show policy effects differ sharply. Selective industrial policy (SIP) and competitive industrial policy (CIP) both boost innovation significantly for large enterprises, with coefficients of 0.287 and 0.298. For SMEs, SIP presents a weaker promotional effect, while CIP exerts a stronger driving force. This scale gap proves selective policy favors large firms and competitive policy benefits SMEs, verifying Hypotheses H3 and H4.

Samples are further categorized by ownership. Both policies positively drive innovation of state-owned enterprises. Non-state-owned firms gain weaker SIP promotion yet stronger CIP stimulation, which also supports the two hypotheses.

Robustness checks confirm result reliability. After substituting core explanatory variables and adopting lagged variables to address endogeneity issues, major research conclusions stay consistent, demonstrating stable and credible findings.

## 5. Conclusion and Policy Suggestions

### 5.1. Research Conclusion

Based on 2018-2022 A-share manufacturing data, the paper compares two industrial policies. Selective policy boosts innovation input only, while competitive policy improves both input and output quality.

This is because selective industrial policy mainly provides resource support for enterprises, which reduces the cost of innovation input, but due to the existence of rent-seeking behavior and information asymmetry, the resources obtained by enterprises may not be fully used for core technology research and development, resulting in no significant improvement in innovation output quality. Competitive industrial policy stimulates the endogenous innovation power of enterprises through fair market competition, which not only promotes enterprises to increase innovation input, but also forces enterprises to improve the quality of innovation output to obtain competitive advantages.

The two policies show obvious heterogeneous effects. Selective policy better boosts innovation of large and state-owned firms, while competitive policy benefits SMEs and private enterprises due to differing resource access and market sensitivity.

### 5.2. Policy Suggestions

Based on the above research conclusions, this paper puts forward the following policy suggestions to optimize the combination of industrial policies and promote enterprise innovation:

First, optimize the orientation of selective industrial policy and focus on improving the quality of innovation output. The government should reduce the extensive support for enterprises, focus on supporting the core technology research and development of enterprises, and establish a supervision mechanism for the use of policy resources to ensure that government subsidies and other resources are truly used for enterprise innovation activities. At the same time, the government should strengthen the evaluation of the innovation effect of selective industrial policy, and adjust the policy intensity and support objects in a timely manner according to the evaluation results.

Governments shall optimize competitive policies by breaking monopolies, safeguarding intellectual property and phasing out outdated capacity. Differentiated policies suit varied firms: selective policies support large state-owned enterprises in core R&D, while competitive ones aid private SMEs in financing and talent cultivation. The two policies should coordinate to jointly drive corporate innovation.

## References

- [1] Yang, W., Wang, X., & Zhou, D. (2024). Research on the impact of industrial policy on the innovation behavior of strategic emerging industries. *Behavioral Sciences*, 14(4), 346. <https://doi.org/10.3390/bs14040346>
- [2] Yan, C., Ji, Y., & Chen, R. (2023). Research on the mechanism of selective industrial policies on enterprises' innovation performance--Evidence from China's photovoltaic industry. *Renewable Energy*, 215, 118868. <https://doi.org/10.1016/j.renene.2023.118868>
- [3] Huang, X., & Zhu, R. (2026). Selective Industrial Policy and Innovation Efficiency in Chinese Listed Companies. *Economics of Transition and Institutional Change*, 34(1), 117–136.
- [4] Liu, T., Yan, W., & Zhang, Y. (2023). Functional or selective policy?-Research on the relationship between government intervention and enterprise innovation in China. *International Review of Economics & Finance*, 86, 82–96. <https://doi.org/10.1016/j.iref.2023.04.007>

- [5] Tian, G. (2020). From industrial policy to competition policy: A discussion based on two debates. *China Economic Review*, 62, 101505. <https://doi.org/10.1016/j.chieco.2020.101505>
- [6] Criscuolo, C., Martin, R., Overman, H., & Van Reenen, J. (2012). *The causal effects of an industrial policy* (Working Paper No. w17842). National Bureau of Economic Research. <https://www.nber.org/papers/w17842>
- [7] Lazzarini, S. G. (2015). Strategizing by the government: Can industrial policy create firm-level competitive advantage? *Strategic Management Journal*, 36(1), 97–112. <https://doi.org/10.1002/smj.2204>
- [8] Alder, S., Shao, L., & Zilibotti, F. (2016). Economic reforms and industrial policy in a panel of Chinese cities. *Journal of Economic Growth*, 21(4), 305–349. <https://doi.org/10.1007/s10887-016-9134-4>
- [9] Reich, R. B. (1982). Making industrial policy. *Foreign Affairs*, 60(4), 852–881. <https://doi.org/10.2307/20041235>
- [10] Weiss, J. (2013). *Strategic industrial policy and business environment reform* (DCED Working Paper). DCED.
- [11] Criscuolo, C., Martin, R., Overman, H. G., & Van Reenen, J. (2019). Some causal effects of an industrial policy. *American Economic Review*, 109(1), 48–85. <https://doi.org/10.1257/aer.20171760>
- [12] Qin, S., & Xiong, Y. (2023). Differential impact of subsidised and nonsubsidized policies on the innovation of new energy vehicle enterprises: Evidence from China. *Asian Journal of Technology Innovation*, 31(2), 260–283. <https://doi.org/10.1080/19761597.2023.2199976>
- [13] Stiglitz, J. E., Lin, J. Y., & Monga, C. (2013). Introduction: the rejuvenation of industrial policy. In J. E. Stiglitz, J. Y. Lin, & C. Monga (Eds.), *The industrial policy revolution I: The role of government beyond ideology* (pp. 1–15). Palgrave Macmillan UK.