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The Revision of Antitrust Law and Corporate Innovation

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Abstract. As China's economy transitions to a stage of high-quality development, strengthening antitrust measures has become a core task for improving competition policy. However, its impact mechanism and effect on micro-level corporate innovation remain unclear. Using a sample of A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2018 to 2024, and employing the implementation of the newly revised Antitrust Law in 2022 as a quasi-natural experiment, this study systematically examines the impact of antitrust policy on corporate innovation level and innovation quality using a Difference-in-Differences (DID) approach. The findings show that the new Antitrust Law significantly suppresses both the total innovation output and the proportion of exploratory innovation among firms with high market power. This conclusion remains robust after a series of tests, including parallel trend tests, placebo tests, and PSM-DID analysis. Heterogeneity analysis reveals that the aforementioned inhibitory effect is more complex in coastal regions and high-tech industries: the suppression of total innovation is stronger, but the relative suppression of exploratory innovation is weaker. Mechanism analysis indicates that the law compresses firms' innovation resource space through two pathways: exacerbating financing constraints and intensifying market competition. These results are consistent with the theoretical expectation that antitrust law inhibits innovation by strengthening resource constraints and risk-bearing pressure. This study provides micro-level evidence for evaluating the economic consequences of antitrust law revisions and offers important insights for refining competition policy design and stimulating market innovation vitality.

Keywords: Antitrust Law; Financing Constraints; Market Competition; Corporate Innovation.

1. Introduction

As China's economy shifts to high-quality development, strengthening competition policy is central to building a high-standard market system. The 20th National Congress report explicitly called for strengthening antitrust and anti-unfair competition. The relationship between competition and innovation has long been debated, contrasting the "Schumpeterian hypothesis" (monopoly fosters innovation) with the "Arrow effect" (competition provides stronger incentives) (Gilbert, 2006). Since the 2022 revision of the Antitrust Law, its impact on micro-level firm behavior, particularly innovation, remains unclear. In its first year, authorities investigated 187 monopoly cases, with penalties totaling 784 million yuan, involving key sectors like internet platforms and pharmaceuticals. Scientifically evaluating this policy's impact on corporate innovation is crucial for refining competition policy and realizing the innovation-driven development strategy.

The economic effects of antitrust policy are a key topic in innovation economics. Studies find that specific policies can enhance collaborative innovation (Zhang Duolei et al., 2026), while the Fair Competition Review System promotes SOE innovation investment (Zhao Xiaoyang et al., 2025). At the micro level, market competition significantly influences firms' resource allocation and investment decisions. Yet existing research mostly focuses on specific policies, lacking a comprehensive evaluation of the foundational Antitrust Law revision, particularly its effect on innovation structure—the allocation between high-risk exploratory innovation and low-risk exploitative innovation.

Theoretically, the law could have a positive effect. First, it breaks the vicious cycle between involution and monopoly, guiding firms towards innovation competition (Wang Xianlin, Gu Nanfei, 2026). Second, by curbing abuse of dominance, it optimizes the innovation ecosystem and reduces

collaboration costs (Zhang Duolei et al., 2026). This reordering constrains short-term behaviors like price dumping, forcing management to allocate more resources to long-term R&D. These mechanisms can alleviate ecological distortions and resource misallocation, positively guiding corporate innovation.

However, the law could also have a suppressive effect. First, compressing monopoly profits weakens firms' ability to self-finance high-risk innovation (Yu Mingyan, Zheng Huizhong, 2025). Second, increased compliance costs and institutional uncertainty reinforce risk aversion (Yu Minggui et al., 2021). This pressure forces firms to shift from exploratory innovation to incremental improvements. Innovation depends on long-term, stable financial input (Yang Kaijie, 2022). Notably, while firms with abundant cash flow may over-invest, the law may correct this inefficiency but ultimately exert an inhibitory effect by exacerbating resource constraints and operational risks.

The net effect remains unclear, requiring empirical testing. Using a sample of A-share listed companies from 2018 to 2024, and the 2022 Antitrust Law revision as a quasi-natural experiment, this paper finds a significant inhibitory effect on both the innovation level and quality of firms with high market power. This conclusion holds after parallel trend tests, placebo tests, and addressing endogeneity. Heterogeneity analysis shows differentiated effects: total innovation is more suppressed in eastern coastal regions and high-tech industries, yet these firms show greater resilience in exploratory innovation. Mechanism tests indicate the law compresses innovation resources through two pathways: exacerbating financing constraints and intensifying market competition. These results align with the theoretical expectation that antitrust inhibits innovation through resource constraints and risk pressure.

The research contributions are threefold. First, it provides new micro-level evidence for evaluating the Antitrust Law revision, revealing its net inhibitory effect. Unlike existing literature focused on specific policies (Zhang Duolei et al., 2026), this paper uses the systematic revision as a quasi-natural experiment with a rigorous DID design, supporting the theory that antitrust may inhibit innovation by compressing profits and increasing uncertainty (Yu Mingyan, Zheng Huizhong, 2025; Yu Minggui et al., 2021).

Second, it reveals the internal mechanisms. Exacerbating financing constraints and intensifying market competition are two key channels. While strengthening competition, the law significantly increases firms' financing constraints, weakening their ability to fund high-risk innovation internally (Brav et al., 2018). This study directly connects macro-legal shocks with micro-level resource constraints, explaining how competition policy alters innovation decisions through the resource and risk environment.

Third, it reveals complex heterogeneity, providing insights for policy coordination. The inhibitory effect is stronger on total innovation in eastern coastal regions and high-tech industries, where reliance on monopoly profits is higher. However, leveraging their superior factor endowments, these firms allocate resources towards exploratory innovation, partially offsetting the negative impact. Policymakers should avoid a "one-size-fits-all" approach and complement antitrust with functional industrial policies that alleviate financing constraints and incentivize breakthrough innovation (Lin Zhifan et al., 2022), especially in innovation-intensive regions and high-tech fields (Guo Kaiming, Liu Chong, 2023).

The structure is as follows: Part II is the literature review, Part III presents research hypotheses, Part IV covers empirical tests, Part V provides heterogeneity analysis and mechanism tests, and Part VI concludes.

2. Literature Review

2.1. Research on Antitrust Law

From a macro-strategic perspective, strengthening antitrust has become a foundational project for improving the socialist market economy system. With the rapid rise of new business formats such as the platform economy, the traditional competitive order faces reconstruction, and issues like market disorder and the uncontrolled expansion of capital have become increasingly prominent. Against this backdrop, the central authorities have repeatedly emphasized strengthening the fundamental position of competition policy and incorporating it into the core agenda of fostering a new development paradigm. Antitrust is no longer merely a tool for correcting market failures; it has become an institutional cornerstone for promoting the liberation of productive forces and ensuring the sustained release of innovation momentum. Particularly at a time when economic growth is shifting gears and the external environment is complex and volatile, constructing fair and transparent competition rules through institutional supply is of great significance for stabilizing the expectations of market entities and stimulating micro-level vitality.

From the perspective of institutional evolution, China's antitrust legal construction has undergone a process of continuous deepening and dynamic adjustment. After the enactment and implementation of the Antitrust Law in 2008, supporting regulations and enforcement guidelines were gradually improved, initially establishing a rule system covering various types of monopolistic conduct. However, with the advent of the digital economy era, traditional rules have gradually shown institutional gaps in addressing new competition issues such as platform "choose-one-from-two," data monopolies, and algorithmic collusion. In this context, the 2022 revision not only filled these gaps but also significantly enhanced penalty intensity and enforcement deterrence, for example, by raising the upper limit of fines to ten percent of the operator's previous year's sales revenue and adding personal liability clauses. Furthermore, normative documents issued in recent years by the Anti-Monopoly Commission of the State Council, such as the Anti-Monopoly Guidelines on Intellectual Property Rights and the Anti-Monopoly Guidelines on the Platform Economy, have provided more refined operational basis for enforcement practices in specific fields. These institutional arrangements together constitute the current complete rule framework for antitrust enforcement.

As a core legal system for maintaining market competition order, the Antitrust Law is characterized by its regulation of monopolistic agreements, abuse of market dominance, and concentrations of undertakings to prevent and curb monopolies, thereby protecting fair market competition. Its mechanism of action is primarily manifested through two pathways: deterrence and correction. On the one hand, it creates deterrence against potential monopolistic conduct by setting legal liabilities, altering firms' expected returns and cost calculations. On the other hand, through the investigation and correction of existing monopolistic conduct, it resets distorted market structures or competitive conditions. The Antitrust Law not only targets economic monopolies; its Chapter V, which regulates the abuse of administrative power to eliminate or restrict competition, directly aims to dismantle local protectionism and administrative monopolies, seeking to break regional market segmentation and promote the free flow of factors.

The literature on the economic consequences of antitrust law can be divided into two categories based on the main objects it affects. The first category of research focuses on the impact of antitrust law on firms' own operational decisions, efficiency, and resource allocation. Studies show that the implementation of the Antitrust Law, by breaking administrative monopolies and strengthening market competition, significantly curbs over-investment and inefficient expansion by state-owned enterprises (SOEs) and improves capacity utilization (Sun Fan et al., 2023). At the same time, by weakening local government intervention, it optimizes the market-oriented allocation of factor resources such as credit, alleviates the financing constraints of small and micro enterprises, and reduces their operating costs, thereby promoting their growth (Bai Yajie et al., 2024).

The second category of literature focuses on the impact of antitrust law on broader socio-economic dimensions, particularly long-term performance indicators such as innovation. The conclusions of this research are divergent and complex. On one hand, some studies point out that pro-competition policies like the Fair Competition Review System can, by breaking the protective umbrella formed by administrative monopolies, force SOEs to increase R&D investment and enhance the quality of their substantive innovation (Zhao Xiaoyang et al., 2025). On the other hand, empirical studies based on the Antitrust Law have found that while the law weakens the market power of monopolistic firms, it may simultaneously suppress their R&D investment and patent output by compressing their profit margins and increasing uncertainty (Yu Mingyan, Zheng Huizhong, 2025). Notably, earlier studies have also found similar inhibitory effects (Yu Minggui et al., 2021).

2.2. Research on Corporate Innovation

The level and quality of corporate innovation result from the interplay of multiple internal and external factors. Investigating these influencing factors is crucial for understanding the drivers of firm growth and the quality of economic development.

The literature on the influencing factors of corporate innovation is extensive. Based on the source and nature of these factors, they can be broadly categorized into two types: internal firm resource and capability factors, and external market environment factors. The first category of literature primarily examines, from an internal firm perspective, how resource endowments, governance structures, and strategic orientations shape firms' innovation incentives and capabilities. Research indicates that supply chain digitalization, by reducing internal and external transaction costs and strengthening external oversight and governance, can significantly enhance a firm's breakthrough innovation capability (Jiao Xiaojing, 2026). Patient capital, by strengthening management's forward-looking attention, enhancing R&D innovation resilience, and accumulating organizational resource slack, drives the transformation of a firm's innovation trajectory from incremental improvements to disruptive change (Feng Qiushuo et al., 2026). These studies reveal the crucial role of internal resource optimization and strategic focus in enhancing innovation quality.

The second category of literature focuses on the external institutional, policy, and market environment, exploring how government intervention, industrial policy, and market regulation influence firms' innovation decisions and resource allocation. The relaxation of market access regulation, by breaking local administrative monopolies, intensifying product market competition, and optimizing factor allocation, can effectively promote corporate innovation and trigger positive strategic adjustments such as increased innovation investment, improved innovation efficiency, and a pursuit of high-quality innovation (Zhou Zhifang et al., 2023). However, the effectiveness of industrial policy varies by type: selective industrial policies may incentivize firms to pursue short-term, easily achievable non-invention patents, whereas functional industrial policies are more likely to encourage high-quality invention patents (Lin Zhifan et al., 2022).

In summary, the existing literature has conducted in-depth explorations of the influencing factors of corporate innovation from multiple levels, including internal firm resources and capabilities, as well as external institutions, policies, and market environments, providing rich perspectives for understanding the mechanisms driving innovation. However, there remains room for extension. Specifically, although some studies have addressed the impact of market access policies aimed at breaking administrative monopolies and promoting fair competition on corporate innovation (Zhou Zhifang et al., 2023) and distinguished the differentiated effects of various industrial policy types on innovation quality (Lin Zhifan et al., 2022), there is still a relative lack of empirical research that directly uses the revision of the Antitrust Law—a foundational and systematic law for maintaining market competition order—as a quasi-natural experiment to systematically investigate its impact on both the level and quality of corporate innovation strategies. The few studies touching upon the relationship between competition policy and innovation also have divergent conclusions and fail to fully incorporate an in-depth analysis within China's unique institutional context, where the Antitrust Law addresses both economic monopolies and administrative monopolies. Therefore, by taking the

implementation of the newly revised Antitrust Law in 2022 as an opportunity to explore its influence on micro-level corporate innovation behavior and its channels of action, this paper can not only provide direct empirical evidence for evaluating the economic consequences of this core legal revision but also, from the perspective of competition policy, link firms' internal resource responses with external institutional constraints, enriching and deepening the literature on the relationship between the legal institutional environment and corporate innovation. This holds significant theoretical value and practical significance.

3. Research Hypotheses

3.1. Research Hypotheses

As a crucial institution of the modern market economy, the Antitrust Law systematically alters firms' operating environment and behavioral patterns by regulating monopolistic conduct and maintaining fair competition order. By restricting the abuse of market dominance, prohibiting monopolistic agreements, and controlling concentrations of undertakings, it compresses the space for firms to rely on monopolies for excess profits, thereby reshaping the external competitive environment and internal incentive structures. This institutional change exerts a profound impact on innovation—a high-input, high-risk activity—with an uncertain direction of effect. Theoretically, antitrust law could either stimulate innovation by strengthening competition or suppress investment by compressing profits. Since its implementation in China in 2008, the regulatory focus has continuously evolved, particularly concerning administrative monopolies, where early enforcement faced challenges due to an incomplete competition policy system. As the system has matured, its mechanisms of influence on corporate innovation have become increasingly complex.

The Antitrust Law exerts a significant positive impact on corporate innovation incentives by strengthening market competition mechanisms. Intensified competition weakens firms' ability to rely on monopoly profits for stable returns, creating a "competitive pressure effect" that prompts firms to increase R&D investment and improve efficiency (Baker, 2007). In a more fiercely competitive market environment, firms must rely on technological innovation, product upgrades, and service optimization to gain market share. Concurrently, the pressure of homogenized competition stimulates the "escape-competition" motive, driving firms to achieve breakthroughs through differentiation and cutting-edge technologies (Aghion et al., 2005). This incentive is reflected not only in increased R&D spending but also in the optimization of innovation direction and improvement of quality. International experience suggests that well-designed competition policies can promote productivity and innovation growth by curbing anti-competitive conduct.

The innovation incentives arising from intensified competition directly promote the realization of corporate innovation through multiple mechanisms. Specifically, enhanced innovation incentives can directly lead to a substantial increase in R&D investment, as firms allocate more resources to technological R&D, product innovation, and process improvement, thereby increasing the quantity and quality of innovation. At the same time, the market competition motive for pursuing differentiation directly targets a systemic improvement in innovation quality; firms focus not only on the quantity but also on the uniqueness and frontier nature of their innovations. The process of translating these innovation incentives into actual innovation outputs involves the optimization of firm resource allocation, the improvement of innovation management systems, and the cultivation of an innovation culture. These two pathways—competition intensification driving incentive enhancement and subsequently R&D investment increase, and competition intensification strengthening the differentiation motive and subsequently boosting innovation quality—work in tandem to produce a comprehensive positive effect on firm innovation. The strengthening of innovation incentives also fosters the improvement of the firm's innovation ecosystem, promoting industry-university-research collaboration and technology transfer, thus forming a virtuous innovation cycle.

Hypothesis 1 is proposed: The implementation of the Antitrust Law promotes corporate innovation by strengthening market competition and innovation incentives.

The Antitrust Law may also exert a significant negative impact on firms' innovation resources and risk-taking capacity by compressing profit margins and strengthening regulatory constraints. While limiting monopolistic conduct, antitrust regulation may weaken firms' ability to accumulate internal funds, reducing the financial resources available for innovation investment (Brav et al., 2018). When a firm's monopoly profits are restricted, its capacity to support high-risk innovation activities through internal accumulation is correspondingly weakened. Furthermore, intensified enforcement brings about a systemic increase in compliance costs and institutional uncertainty. Firms need to invest more resources to cope with antitrust reviews and compliance requirements, which squeezes out resources originally available for innovation (Yu Mingyan, Zheng Huizhong, 2025). Empirical research utilizing the implementation of China's Antitrust Law as a quasi-natural experiment has found that the law produces a significant inhibitory effect on the patent output of monopolistic firms (Yu Minggui et al., 2021), providing direct evidence for the pathway through which resource constraints and risk suppress innovation. It is noteworthy that intensified product market competition itself can also directly increase firms' debt financing costs, further exacerbating their financial constraints (Valta, 2012).

Resource constraints and increased risk suppress corporate innovation through multiple channels. Innovation relies on sustained capital investment and stable resource guarantees; funding constraints directly lead to reduced R&D spending and project curtailment (Brav et al., 2018). In such circumstances, firms often prioritize meeting short-term operational needs and cut back on long-term innovation investments. Simultaneously, rising institutional uncertainty and compliance risk strengthen firms' tendency towards risk aversion, reducing high-risk exploratory innovation and shifting focus towards incremental innovation with more certain returns (Yu Mingyan, Zheng Huizhong, 2025). This behavior not only reduces the quantity of innovation but also weakens its quality and breakthrough potential. From a dynamic perspective, resource and risk constraints may erode a firm's technological accumulation and core competitiveness, making it more susceptible to competitive disadvantages, especially in industries characterized by rapid technological change. Therefore, the Antitrust Law, through the transmission mechanisms of resource constraints and risk, may inhibit corporate innovation.

Hypothesis 2 is proposed: The implementation of the Antitrust Law inhibits corporate innovation by exacerbating resource constraints and increasing risk.

3.2. Empirical Design

3.2.1. Baseline Regression Model

To test the impact of the newly revised Antitrust Law in 2022 on the level and quality of corporate innovation, this paper constructs the following Difference-in-Differences (DID) models, drawing on existing research (Wang Yanchao, Jiang Yahan, 2020; Yu Mingyan, Zheng Huizhong, 2025):

$$\text{Patent}_{it+1} = \alpha+\beta_1(Treat_i \times Post_t)+\gamma Controls_{it}+\mu_i+\lambda_t+\epsilon_{it} \quad (1)$$

$$\text{ExploreRate}_{it+1} = \alpha+\beta_1(Treat_i \times Post_t)+\gamma Controls_{it}+\mu_i+\lambda_t+\epsilon_{it} \quad (2)$$

Here, subscripts i and t represent firm and year, respectively. Considering that the formation of innovation output requires a certain R&D cycle and that a policy shock in the current period is unlikely to immediately translate into patent output within the same year, this paper adopts T+1 period dependent variables, setting the dependent variable to the value in year t+1. This helps mitigate reverse causality and more accurately captures the lagged effects of the policy shock on innovation

activities. Patent_{it+1} is the proxy variable for the level of corporate innovation. $\text{ExploreRate}_{it+1}$ is the proxy variable for the quality of corporate innovation. $Treat_i$ is the dummy variable for the treatment group. $Post_t$ is the dummy variable for the policy implementation period. $Treat_i \times Post_t$ is the interaction term for the DID estimator, and its coefficient β_1 is the core focus of this paper, reflecting the net effect of the Antitrust Law revision. $Controls_{it}$ is a vector of control variables. μ_i represents firm fixed effects, controlling for time-invariant firm-specific characteristics. λ_t represents year fixed effects, controlling for common time-varying shocks such as macroeconomic and policy environments. ϵ_{it} is the random disturbance term.

3.2.2. Variable Definition and Measurement

3.2.2.1. Firm Innovation Level and Innovation Quality

Total Patent Applications (Patent): Following existing practices (Yu Mingyan, Zheng Huizhong, 2025; Feng Qiushuo et al., 2026), this variable is measured as the natural logarithm of one plus the total number of patent applications (invention, utility model, and design) filed by the firm in the current year. The data source is the CNRDS database.

Innovation Quality (ExploreRate): Existing literature measures innovation quality primarily through dimensions such as the technological novelty of patents, the breadth of knowledge base, and market influence. Although some scholars directly use total patent counts or total citation counts as proxies for innovation quality, these indicators mainly reflect the "quantity" or "impact" of innovation and cannot effectively distinguish whether an innovation is an incremental improvement along existing technological trajectories or a fundamental breakthrough opening up new knowledge domains. The latter is considered crucial for driving long-term technological progress and gaining competitive advantage. To precisely capture this critical quality dimension in firms' innovation strategies, this paper, following established methods (Byun et al., 2021), measures innovation quality from the perspective of knowledge exploration and exploitation. The core logic of this method is that breakthrough innovation often involves exploration into unknown technological fields, whereas incremental innovation involves the deepening and exploitation of a firm's existing knowledge base.

Specifically, we first define incremental innovation: If an IPC subclass of a patent application filed by a firm in the current year (considering only invention and utility model patents) has appeared in the firm's patent applications over the past five years, that patent is classified as an incremental innovation generated within a "familiar subclass." The formula for calculating the proportion of incremental innovation is: Number of invention and utility model patent applications by the firm in "familiar subclasses" in the current year / Total number of invention and utility model patent applications by the firm in the current year.

Based on this, we construct our core dependent variable—the proportion of breakthrough innovation—to measure innovation quality:

ExploreRate = 1 - Proportion of Incremental Innovation

A higher value of this indicator suggests that the firm's innovation activities are more inclined towards exploring entirely new technological fields, indicating higher innovation quality and stronger breakthrough potential. Conversely, a lower value suggests the firm's innovation relies more on improvements to existing technological pathways. This measurement method effectively strips away innovation quantity, directly reflecting the "qualitative" direction of innovation activities, and aligns closely with the core issue of how technological spillovers affect firms' innovation strategies.

3.2.2.2. Core Explanatory Variable: Policy Shock (Treat × Post)

The core explanatory variable in this paper is the interaction term (Treat × Post). The construction of the treatment group dummy variable (Treat) is crucial for identifying the policy effect. Since the revision of the Antitrust Law is a national law, to capture the heterogeneity of the policy's impact on firms, this paper draws on existing methods (Wang Yanchao et al., 2020; Yu Mingyan, Zheng

Huizhong, 2025) and groups firms based on their market power before the policy implementation. Specifically, we use the Lerner Index to measure a firm's market power and degree of monopoly in 2021. The formula is (Operating Revenue - Operating Costs - Selling Expenses - Administrative Expenses) / Operating Revenue. A higher value indicates stronger pricing power and a higher degree of monopoly. We rank the sample firms by their 2021 Lerner Index in descending order. Firms ranking in the top tercile are defined as the treatment group (Treat = 1), representing high-monopoly firms expected to be more affected by the policy shock. Firms ranking in the bottom tercile are defined as the control group (Treat = 0), representing low-monopoly firms relatively less affected by the policy. The policy time dummy variable (Post) is defined as follows: Considering the lagged effect of legal implementation and the annual nature of financial data, Post takes a value of 1 for the year 2023 and subsequent years, representing the post-policy period, and 0 otherwise. This paper focuses primarily on the regression coefficient β_1 of the interaction term (Treat × Post). If its estimated value is significantly negative in the regressions for total innovation (Patent) or exploratory innovation ratio (ExploreRate), it indicates that the revision of the Antitrust Law significantly inhibited the innovation activities of high-monopoly firms, thereby validating our core hypothesis.

3.2.2.3. Control Variables (Controls)

To control for other factors that may influence corporate innovation, a series of firm characteristic and governance variables are introduced as control variables. Drawing on existing research (Bi Qian, Li Jing, 2023; Zhao Xiaoyang et al., 2025; Jiao Xiaojing, 2026), these include: Firm Size (Size), Leverage Ratio (Leverage), Return on Assets (ROA), Firm Age (FirmAge), Largest Shareholder Ownership (Top1), Nature of Property Rights (SOE), Fixed Asset Ratio (Fixed), Proportion of Independent Directors (IndRate), Cash Holdings (Cash), and Tobin's Q (TobinQ). Furthermore, firm fixed effects and year fixed effects are controlled for in all regressions to absorb time-invariant firm heterogeneity and common macroeconomic time trends. To mitigate potential cross-sectional correlation issues, standard errors for all regressions are clustered at the firm level. Detailed definitions of all variables are provided in Table 1.

Table 1. Variable Definitions

Variable Symbol	Variable Name	Variable Definition
Patent	Total Innovation	Number of firm patents
ExploreRate	Exploratory Innovation	Ratio of exploratory innovation to total innovation
Treat	Policy Dummy Variable	Treatment group = 1, control group = 0
Post	Time Dummy Variable	Post-policy period = 1, pre-policy period = 0
Treat×Post	Diff-in-Diff Term	Treat × Post
Size	Firm Size	Natural logarithm of total assets at year-end
Leverage	Leverage Ratio	Total liabilities / Total assets
ROA	Return on Assets	Net profit / Total assets
FirmAge	Firm Age	Years since incorporation (natural logarithm)
Top1	Largest Shareholder Ratio	Shareholding ratio of the largest shareholder
SOE	State-Owned Enterprise	State-owned enterprise = 1, non-state-owned enterprise = 0
Fixed	Fixed Asset Ratio	Fixed assets / Total assets
IndRate	Independent Director Ratio	Number of independent directors / Total board members
Cash	Cash Holdings	Cash and cash equivalents / Total assets
TobinQ	Tobin's Q	Market value / Asset replacement cost
Firm	Firm Fixed Effects	Firm dummy variables
Year	Year Fixed Effects	Year dummy variables

3.2.3. Data Sources and Sample Processing

This paper uses A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2018 to 2024 as the research sample. The data primarily originates from the CSMAR database, the Wind database, and the Chinese Research Data Services (CNRDS) platform. To ensure sample quality, we exclude financial industry firms, firms with special status designations (ST, *ST, PT), and observations with missing key variables. All continuous variables are winsorized at the 1st and 99th percentiles to control for the influence of extreme values. Ultimately, we construct an unbalanced firm-year panel dataset. Corporate financial and governance data are sourced from the CSMAR and Wind databases, while the core patent data used to measure innovation output and quality (including patent application counts, types, and IPC classification information) are primarily obtained from the CNRDS Listed Company Patent Research Database.

3.2.4. Descriptive Statistics

Table 2. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	P25	Median	P75	Max
Patent	14547	3.11	1.71	0.00	2.08	3.22	4.25	7.36
ExploreRate	13042	0.77	0.28	0.00	0.61	0.89	1.00	1.00
Treat	14547	0.45	0.50	0.00	0.00	0.00	1.00	1.00
Post	14547	0.38	0.49	0.00	0.00	0.00	1.00	1.00
Treat×Post	14547	0.19	0.39	0.00	0.00	0.00	0.00	1.00
Size	14547	22.40	1.33	20.08	21.43	22.19	23.17	26.43
Leverage	14547	0.42	0.21	0.06	0.25	0.41	0.58	0.90
ROA	14547	0.03	0.08	-0.33	0.01	0.03	0.07	0.22
FirmAge	14547	3.07	0.28	2.30	2.89	3.09	3.26	3.66
Top1	14547	0.32	0.15	0.07	0.21	0.30	0.42	0.73
SOE	14547	0.32	0.47	0.00	0.00	0.00	1.00	1.00
Fixed	14547	0.19	0.15	0.00	0.07	0.16	0.28	0.67
IndRate	14547	0.38	0.05	0.33	0.33	0.36	0.43	0.57
Cash	14547	0.16	0.12	0.01	0.07	0.12	0.21	0.59
TobinQ	14547	2.01	1.37	0.81	1.18	1.56	2.28	8.81

Table 2 reports the descriptive statistics for the main variables. Regarding the core variables, the mean of total firm innovation (Patent) is 3.11, with a standard deviation of 1.71, indicating that sample firms hold an average of approximately 22 patents, but there is considerable variation in innovation output across firms. The mean of the exploratory innovation ratio (ExploreRate) is 0.77, with a standard deviation of 0.28, suggesting that, on average, about 77% of sample firms' innovation activities are exploratory in nature. However, there is also significant divergence among firms in their choice of innovation strategy. The mean of the policy shock variable (Treat×Post) is 0.19, indicating that approximately 19% of the sample observations are both in the treatment group and located in the post-policy period. Regarding the control variables, the mean of firm size (Size) is 22.40, the mean of the leverage ratio (Leverage) is 0.42, the mean of return on assets (ROA) is 0.03, the mean of the largest shareholder's ownership ratio (Top1) is 0.32, and the mean of the state-owned enterprise dummy (SOE) is 0.32, indicating that about 32% of the sample firms are state-owned enterprises. Notably, the standard deviations of the core explanatory variable (Treat×Post) and the dependent variables (Patent, ExploreRate) are relatively large. This reflects significant individual heterogeneity among sample firms in their innovation behavior and the degree to which they are affected by the policy, providing the necessary variation for this paper to employ the Difference-in-Differences model to identify the policy effect.

4. Empirical Analysis

4.1. Baseline Regression Results Analysis

Table 3. Baseline DID Regression Results

Variable	Patent		ExploreRate	
	(1)	(2)	(3)	(4)
Treat_Post	-0.028	-0.114***	-0.067***	-0.080***
	(0.031)	(0.031)	(0.010)	(0.010)
Size		0.436***		0.044***
		(0.042)		(0.010)
Leverage		-0.424***		0.043
		(0.134)		(0.036)
ROA		0.544***		-0.064
		(0.148)		(0.041)
FirmAge		-1.375***		0.514***
		(0.372)		(0.112)
Top1		0.276		-0.106*
		(0.224)		(0.058)
SOE		-0.018		0.001
		(0.060)		(0.021)
Fixed		-0.028		0.150***
		(0.173)		(0.049)
IndRate		0.271		-0.059
		(0.240)		(0.065)
Cash		-0.101		0.016
		(0.119)		(0.039)
TobinQ		0.037***		0.008***
		(0.010)		(0.003)
_cons	3.065***	-2.664**	0.701***	-1.772***
	(0.018)	(1.328)	(0.005)	(0.377)
Year	YES	YES	YES	YES
Firm	YES	YES	YES	YES
N	14547	14547	13042	13042
R-squared	0.209	0.234	0.161	0.170

Note: Robust standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The same applies to the subsequent tables.

Table 3 reports the baseline regression results of the impact of the Antitrust Law revision on corporate innovation. Column (1) includes only the core explanatory variable (Treat×Post) and fixed effects, providing a preliminary examination of the policy shock's impact on total innovation (Patent). Column (2) adds all control variables to Column (1) to control for the influence of firm characteristics and governance structures, thereby identifying the policy effect more accurately. Columns (3) and (4) further examine the impact of the policy shock on innovation quality (ExploreRate, i.e., the proportion of breakthrough innovation), corresponding to the basic model and the model with control variables added, respectively.

The regression results show that in Column (1), the coefficient of Treat×Post is -0.028, but it is not statistically significant. However, after adding control variables in Column (2), the coefficient of Treat×Post becomes -0.114 and is significant at the 1% level. This indicates that, after controlling for other factors, the revision of the Antitrust Law significantly suppressed the total innovation output of firms with a high degree of monopoly power (the treatment group). In the basic model of Column (3), the coefficient of Treat×Post is -0.067, significantly negative at the 1% level. In Column (4), after

adding control variables, the coefficient is -0.080, also significant at the 1% level. This means that the policy shock not only reduced the quantity of innovation by high-monopoly firms but also significantly decreased the proportion of exploratory innovation in their innovation activities, implying a decline in innovation quality. Taken together, the baseline regression results consistently support the core hypothesis of this paper: the revision of the Antitrust Law, by strengthening fair market competition, has produced a significant innovation-inhibiting effect on firms with market power, manifested as a dual decline in both the quantity and quality of corporate innovation.

4.2. Robustness Checks

Although the baseline regression results indicate that the revision of the Antitrust Law has a significant inhibitory effect on corporate innovation, these results may be subject to endogeneity issues or interference from coincidental factors. To verify the robustness of the baseline conclusions, this paper conducts a series of supplementary tests.

4.2.1. Parallel Trend Test

A core prerequisite for the validity of the Difference-in-Differences model is that the treatment group and the control group satisfy the parallel trends assumption before the policy shock. To test this assumption, this paper employs an event study approach, constructing interaction terms between dummy variables for each year before and after the policy implementation and the treatment group dummy variable. The regression results are presented in Table 4.

Table 4. Parallel Trend Test

Variable	Patent	ExploreRate
	(1)	(2)
pre_4	-0.036	0.012
	(0.050)	(0.013)
pre_3	-0.051	-0.007
	(0.044)	(0.011)
pre_2	0.003	-0.000
	(0.034)	(0.010)
current	-0.052*	-0.084***
	(0.030)	(0.010)
post_1	-0.213***	-0.073***
	(0.038)	(0.014)
N	14547	13042
R-squared	0.235	0.170

Columns (1) and (2) of Table 4 report the parallel trend test results with total innovation (Patent) and exploratory innovation ratio (ExploreRate) as the dependent variables, respectively. In the table, pre_4, pre_3, and pre_2 represent the fourth year, third year, and second year before the policy implementation, respectively. The results show that in all years prior to the policy implementation, the coefficients of the interaction terms are not significantly different from zero (p-values are all greater than 0.1). This indicates that before the revision of the Antitrust Law took effect, the treatment group (high-monopoly firms) and the control group (low-monopoly firms) did not exhibit significant systematic differences in either total innovation output or innovation quality. This satisfies the parallel trends assumption, providing a foundation for subsequent causal inference.

Further observing the coefficients for the current period of policy implementation (current) and one year after (post_1), we find that in the year of policy implementation, the impact on total innovation is significantly negative at the 10% level (coefficient -0.052), and the impact on the exploratory innovation ratio is significantly negative at the 1% level (coefficient -0.084). In the year following policy implementation, both coefficients increase further in magnitude and are highly significant at

the 1% level (-0.213 and -0.073, respectively). This dynamic effect clearly demonstrates that the impact of the policy shock is not instantaneous but exhibits a certain time lag, followed by a sustained and strengthening inhibitory effect in subsequent years. This strongly supports the reliability of the baseline regression findings.

4.2.2. Placebo Test

To rule out the possibility that the baseline regression results are driven by random factors or unobservable omitted variables, this paper conducts a placebo test by randomly assigning the treatment group. The specific procedure is as follows: keeping the research sample, policy time points, and control variables unchanged, we randomly generate fictitious treatment group individuals based on the actual number of observations in the treatment group, construct fictitious policy shock interaction terms, repeat the regression 1,000 times, and record the coefficient estimates of these fictitious interaction terms.

The test results are shown in Figure 1. The fictitious coefficients obtained from the 1,000 random regressions are all highly concentrated around zero, exhibiting a distinct normal distribution pattern. This indicates that randomly fabricated policy shocks do not produce systematic effects. The true coefficient from our baseline regression, represented by the dashed line in the figure, is clearly located in the tail of the distribution of random coefficients, completely separate from the distribution of fictitious coefficients. Such an extreme value would almost never occur in random simulation scenarios.

The above results indicate that the policy effect identified in the baseline regression is not driven by random bias or unobservable factors, confirming the robustness and reliability of the core conclusions of this paper.

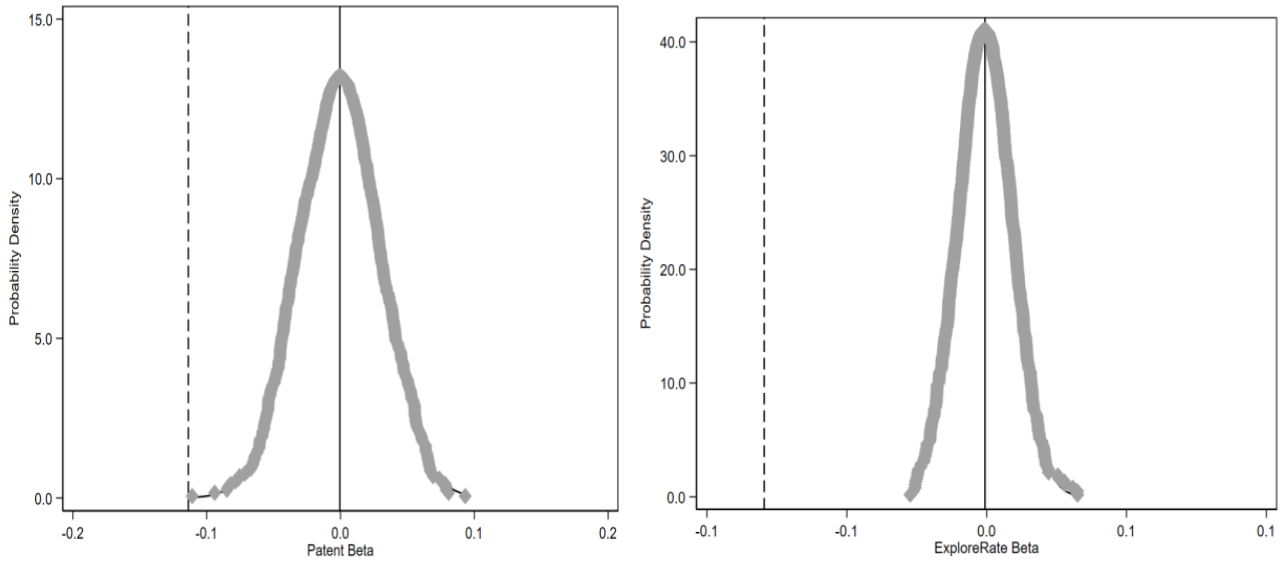

Figure 1. Distribution of Coefficients and t-values after Random Treatment

4.3. PSM-DID

Although the Difference-in-Differences model can effectively mitigate endogeneity issues arising from time-invariant unobservable factors by controlling for firm fixed effects and year fixed effects, there may still be observable systematic differences between the treatment group (high-monopoly firms) and the control group (low-monopoly firms) prior to the policy implementation. This selection bias caused by observable characteristics, if not adequately controlled, will cause the assignment mechanism of the treatment group to violate the conditional independence assumption, leading to biased estimation results. To more rigorously identify the causal effect of the policy shock, this paper adopts the Propensity Score Matching-Difference-in-Differences (PSM-DID) approach, following existing studies, to mitigate this endogeneity problem.

Specifically, we use all control variables from the year prior to the policy implementation as covariates, estimate propensity scores using a Logit model, and employ nearest-neighbor matching (1:1 without replacement, caliper value 0.05) to match each treatment group firm with a control group firm having the most similar characteristics. After matching, the standardized biases of all covariates are substantially reduced to below 5%, and there are no significant differences between the treatment group and the matched control group across all characteristics. This indicates that the matching procedure has effectively eliminated the systematic differences in observable characteristics.

Table 5. PSM-DID Regression Results

Variable	Patent	ExploreRate
	(1)	(2)
Treat×Post	-0.108***	-0.081***
	(0.032)	(0.010)
Size	0.460***	0.048***
	(0.044)	(0.010)
Leverage	-0.462***	0.050
	(0.139)	(0.036)
ROA	0.517***	-0.063
	(0.152)	(0.042)
FirmAge	-1.414***	0.486***
	(0.377)	(0.113)
Top1	0.268	-0.109*
	(0.229)	(0.059)
SOE	-0.010	0.005
	(0.061)	(0.021)
Fixed	0.001	0.162***
	(0.180)	(0.050)
IndRate	0.402	-0.044
	(0.245)	(0.066)
Cash	-0.087	0.034
	(0.125)	(0.040)
TobinQ	0.036***	0.010***
	(0.012)	(0.003)
_cons	-3.100**	-1.801***
	(1.373)	(0.386)
Year	YES	YES
Firm	YES	YES
N	13712	12254
R-squared	0.222	0.168

Based on the matched balanced sample, the Difference-in-Differences estimation is re-conducted, and the results are reported in Table 6. The coefficients of the core explanatory variable Treat×Post are significantly negative at the 1% level for both total innovation and exploratory innovation, which is highly consistent with the baseline regression results. This indicates that after mitigating the selection bias arising from observable characteristics, the inhibitory effect of the Antitrust Law revision on innovation by high-monopoly firms remains robust, thereby strengthening the causal interpretation of this paper's conclusions.

5. Further Analysis

5.1. Heterogeneity Analysis

To explore the heterogeneity of the impact of the Antitrust Law revision on corporate innovation, this paper conducts grouped tests from two dimensions: regional characteristics and industry characteristics, aiming to reveal the differentiated performance of the policy effect under different contexts.

5.1.1. Eastern Coastal Regions vs. Non-Coastal Regions

Eastern coastal regions typically possess more developed market mechanisms, more intense market competition, and more vibrant innovation ecosystems. On one hand, firms in coastal regions face stronger external competitive pressure and may be more sensitive to antitrust policies. On the other hand, these firms have richer innovation resources and may possess a stronger ability to cope with policy shocks. Therefore, the policy effect may differ between coastal and non-coastal regions.

Following established conventions, this paper defines ten provinces (municipalities directly under the central government)—Guangdong, Zhejiang, Jiangsu, Shandong, Fujian, Liaoning, Hebei, Tianjin, Hainan, and Shanghai—as eastern coastal regions (coastal = 1), and the remaining regions as non-coastal regions (coastal = 0). A dummy variable for coastal regions and its interaction term with the core explanatory variable are added to the model. Columns (1) of Tables 8 and 9 report the regression results for total innovation and exploratory innovation ratio, respectively.

5.1.2. High-Tech Industries vs. Non-High-Tech Industries

High-tech industries are characterized by knowledge intensity, active innovation, and dynamic competition (Yu Mingyan, Zheng Huizhong, 2025). Antitrust policy aims to maintain market competition, which in high-tech industries often manifests as innovation races. Consequently, the impact of the policy on innovation by firms in high-tech industries may be more complex. On one hand, the policy may curb their incentive to use market position to extract innovation rents. On the other hand, it may force them to maintain competitive advantages through substantive innovation.

Referring to the National Bureau of Statistics' Classification of High-Tech Industries (Manufacturing) (2017) and Classification of High-Tech Industries (Services) (2018), this paper defines the high-tech industry group (high_tech = 1). A dummy variable for high-tech industries and its interaction term with the core explanatory variable are added to the model.

Table 6. Heterogeneity Analysis

Variable	Patent		Variable	
	Eastern Coastal Region (1)	High-Tech Industry(2)	Eastern Coastal Region (3)	High-Tech Industry (4)
Treat×Post	-0.038	0.049	-0.102***	-0.154***
	(0.035)	(0.036)	(0.011)	(0.011)
coastal	-0.006		-0.063	
	(0.132)		(0.045)	
Treat×Post_coastal	-0.119***		0.036***	
	(0.038)		(0.011)	
high_tech		0.205**		-0.015
		(0.088)		(0.027)
Treat×Post_high_tech		-0.256***		0.109***
		(0.039)		(0.012)
_cons	-2.690***	-3.551***	-1.737***	-1.503***
	(0.957)	(0.962)	(0.300)	(0.300)
Year	YES	YES	YES	YES
Firm	YES	YES	YES	YES
N	14547	14547	13042	13042
R-squared	0.234	0.237	0.171	0.177

Total Innovation. Column (1) of Table 7 shows that the coefficient of Treat×Post_coastal is -0.119, significant at the 1% level. The marginal effects indicate that the inhibitory effect in non-coastal regions is -0.038 and not significant, while it increases to -0.157 in coastal regions. This suggests that the inhibitory effect of the Antitrust Law revision on total innovation among high-monopoly firms is more pronounced in coastal regions. A possible explanation is that coastal regions have more complete market competition and more efficient policy signal transmission, exposing high-monopoly firms to greater competitive pressure and innovation adjustment pressure, thereby exerting a stronger suppression on their total innovation output. In Column (2), the coefficient of Treat×Post_high_tech is -0.256, significant at the 1% level. The total innovation effect in non-high-tech industries is an insignificant positive effect (0.049), while it turns into -0.207 in high-tech industries. This indicates that the revision significantly suppressed the total innovation output of high-monopoly firms in high-tech industries. Innovation in high-tech industries typically requires substantial sunk costs, and the uncertainty brought by the policy may weaken firms' willingness to make large-scale innovation investments, leading to a decline in output.

Exploratory Innovation. Column (3) shows that the coefficient of Treat×Post_coastal is 0.036, significantly positive at the 1% level. The inhibitory effect on the exploratory rate in non-coastal regions is -0.102 and significant, while it decreases to -0.067 in coastal regions, indicating that the exploratory innovation of high-monopoly firms in coastal regions exhibits a certain degree of resilience. This phenomenon may be attributable to the richer innovation resources, higher talent density, and more mature innovation networks in coastal regions. In Column (4), the coefficient of Treat×Post_high_tech is 0.109, significantly positive at the 1% level. The inhibitory effect on the exploratory rate in non-high-tech industries is -0.154 and significant, while it weakens to -0.045 in high-tech industries. According to organizational ambidexterity theory, exploratory innovation relies more on long-term accumulation and sustained investment (Jansen et al., 2006). Moreover, high-tech industries attract more institutional investors, who tend to support long-term innovation activities (Aghion et al., 2013), mitigating the negative impact of the policy shock to some extent. Therefore, even under antitrust pressure, high-tech firms must maintain a certain level of exploratory innovation to sustain competitiveness, making it exhibit greater stability.

The heterogeneity analysis indicates that the effect of the Antitrust Law revision is not unidirectional but is closely related to the regional environment and industry technological characteristics in which firms operate. The policy's inhibitory effect on total innovation is more prominent in coastal regions and high-tech industries, whereas its inhibitory effect on exploratory innovation is stronger in non-coastal regions and non-high-tech industries. These findings suggest that policy formulation should fully consider the differentiated characteristics of regions and industries. Particularly in innovation-intensive fields, emphasis should be placed on strengthening the protection and incentivization of exploratory innovation, in order to achieve an organic integration of maintaining market competition and stimulating innovation momentum.

5.2. Mechanism Analysis

The baseline regression above has confirmed that the revision of the Antitrust Law significantly suppressed the innovation output of high-monopoly firms. To clarify the internal transmission logic of the policy's effect, this paper conducts mechanism tests focusing on two pathways: intensified market competition and exacerbated financing constraints. On one hand, by strengthening market competition, the policy may compress firms' monopoly profits, weakening the financial foundation and willingness for long-term, high-risk innovation investments. On the other hand, the policy directly weakens the market dominance and excess profit-generating capacity of high-monopoly firms, potentially exacerbating their external financing constraints, thereby inhibiting sustained investment in R&D activities. The exacerbation of financing constraints is regarded here as a key intermediate channel linking the policy shock to changes in firms' innovation behavior.

Table 7. Complete Results of Mechanism Tests

Variable	Competition	SA Index	FC Index	KZ Index
Treat×Post	1.291***	0.005**	0.116***	0.207***
	(0.278)	(0.002)	(0.005)	(0.045)
Size	0.526	-0.005	-0.204***	-0.228***
	(0.370)	(0.006)	(0.007)	(0.055)
Leverage	-2.155	0.017	-0.335***	4.914***
	(1.381)	(0.011)	(0.021)	(0.182)
ROA	3.399**	0.018**	0.631***	-5.524***
	(1.489)	(0.007)	(0.023)	(0.281)
FirmAge	15.588***	0.157***	-0.004	0.926*
	(3.711)	(0.029)	(0.053)	(0.489)
Top1	-3.474	-0.037*	0.124***	0.066
	(2.234)	(0.020)	(0.031)	(0.285)
SOE	0.526	0.004	0.011	0.228**
	(0.488)	(0.003)	(0.010)	(0.093)
Fixed	0.704	0.007	-0.035	1.078***
	(1.462)	(0.011)	(0.026)	(0.241)
IndRate	-0.389	-0.029	0.023	1.197***
	(2.155)	(0.021)	(0.036)	(0.320)
Cash	0.591	-0.002	-0.146***	-6.379***
	(1.154)	(0.008)	(0.020)	(0.216)
TobinQ	0.269***	-0.002**	-0.027***	0.395***
	(0.098)	(0.001)	(0.002)	(0.017)
Constant	-33.042**	3.491***	5.194***	0.695
	(13.155)	(0.143)	(0.208)	(1.817)
Year	YES	YES	YES	YES
Firm	YES	YES	YES	YES
N	14547	14547	14543	14543
adj-R²	0.141	0.831	0.366	0.490

To test the financing constraint mechanism, this paper draws on financing constraint indicators constructed in existing studies (Hadlock and Pierce, 2010; Ju Xiaosheng et al., 2013; Kaplan and Zingales, 1997) to comprehensively measure corporate financing constraints from multiple dimensions. Among them, the SA index is a negative indicator, where a larger absolute value indicates stronger financing constraints, while the FC index and the KZ index are positive indicators. The regression results in Table 7 show that the regression coefficients of the core explanatory variable Treat×Post on the absolute value of the SA index, the FC index, and the KZ index are 0.005, 0.116, and 0.207, respectively, and are all significantly positive at the 5% or 1% level. This indicates that after the implementation of the Antitrust Law revision, the financing constraints faced by high-monopoly firms have significantly intensified. Existing studies have shown that financing constraints significantly limit firms' investment capacity, especially exerting a more prominent inhibitory effect on the long-term innovation activities of R&D-intensive firms. As innovation activities are characterized by long cycles, high uncertainty, and reliance on sustained capital investment, the worsening of financing constraints directly restricts firms' ability to finance R&D projects, thereby suppressing their innovation activities. Therefore, the exacerbation of financing constraints is one of the core pathways through which the Antitrust Law inhibits corporate innovation.

Regarding the market competition pressure mechanism, the Antitrust Law aims to break industry monopolies and strengthen market competition (Bai Yajie et al., 2024). This paper uses the Herfindahl-Hirschman Index (HHI) to measure industry monopoly power, where a larger index value indicates higher market concentration and stronger monopoly power. To more intuitively reflect the

degree of competition, its reciprocal (1/HHI) is used as a proxy variable for the degree of competition in the mechanism test, where a larger value indicates more sufficient market competition. The regression results show that the coefficient of Treat×Post on the degree of competition (1/HHI) is 1.291 and is significant at the 1% level, indicating that industry competition has significantly intensified after the policy implementation. Although intensified competition may force firms to innovate, it may also weaken firms' long-term R&D investment capacity by compressing monopoly profits and reducing internal fund accumulation (Xiao Tusheng et al., 2023). At the same time, the changes in the institutional environment brought about by antitrust enforcement also increase the uncertainty faced by firms in their operations. The rise in policy uncertainty further incentivizes management to shift towards short-term investments and avoid long-term high-risk innovation projects, thereby reinforcing the inhibitory effect of intensified competition on innovation (Bhattacharya et al., 2017). Therefore, the intensification of market competition is an important transmission channel through which the Antitrust Law inhibits corporate innovation.

6. Conclusion

As China's economy transitions to a stage of high-quality development, improving competition policies to stimulate corporate innovation vitality has become a core issue. This paper takes A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2018 to 2024 as the research sample, uses the implementation of the newly revised Antitrust Law in 2022 as a quasi-natural experiment, and employs the Difference-in-Differences method to examine the impact of antitrust policy on corporate innovation. The study finds that the new Antitrust Law significantly suppressed both the total innovation output and the proportion of exploratory innovation among high-monopoly firms. Heterogeneity analysis reveals that the above inhibitory effects exhibit a complex structure in eastern coastal regions and high-tech industries: the suppression of total innovation is stronger, but the relative suppression of exploratory innovation is weaker. The transmission mechanism indicates that the law's implementation compresses firms' innovation resource space through two pathways—exacerbating financing constraints and intensifying market competition—ultimately leading to innovation contraction. These findings are consistent with the theoretical expectation that competition policy inhibits innovation by strengthening resource constraints (Jiao Haitao, Mei Keyue, 2025). The policy implications are that while antitrust policies safeguard fair competition, they should be vigilant about their potential negative impact on exploratory innovation. Complementary industrial policies to alleviate financing constraints should be implemented, and a "one-size-fits-all" approach to enforcement should be avoided. Particularly in innovation-intensive regions and high-tech fields, a dynamic balance between competitive order and innovation momentum should be sought.

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