

The Innovation Paradox of Registration Reform: Inefficient Investment Mediation Effects and Heterogeneous Firm Responses

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Annotation. Registration system reform aims to optimize resource allocation and stimulate market dynamics. Many countries have adopted it as a key institutional innovation in their capital markets. However, whether such reform effectively promotes corporate innovation—especially across different enterprise types—remains unclear. To explore the innovation paradox of registration reform, drawing on information asymmetry and investor behavior theories, and using data from the Chinese A-share Growth Enterprise Market (GEM) and Main Board firms covering the period from 2018 to 2022, the impact of the reform, the underlying mechanisms, and the heterogeneous effects on innovation were analyzed with a difference-in-differences (DID) approach. Results show that the registration system reform does not promote corporate innovation as expected. Although the reform has led to an increase in overall enterprise investment, much of this additional investment is inefficient. As a result, the overall innovation capacity of firms has declined. This finding confirms that inefficient investment acts as a mediating factor through which reform weakens corporate innovation. Further analysis reveals significant differences in the impact of the reform. The negative effects are most pronounced for non-manufacturing enterprises, firms located in the eastern region, and companies with low price–earnings ratios. For other firm types, the impact is not significant. This study highlights the unintended consequences of reforming the registration system for corporate innovation, particularly when investment efficiency does not improve. The conclusions obtained from this study contribute to the theoretical understanding of innovation and offer practical insights for optimizing future reform policies.

Keywords: registration reform, enterprise innovation, inefficient investment.

JEL classification: O31, G38, G31.

Introduction

Global corporate innovation is thriving. Countries worldwide remain committed to enhancing the innovative capacity of their enterprises. According to the Global Innovation Index Report 2023 of the World Intellectual Property Organization, global innovation has continued to grow steadily. The Index increased by 15% in 2023 compared with 2015. Data from the Organisation for Economic Cooperation and Development (OECD) also show an upward trend in global investment in research and development (R&D). As of 2022, total global R&D investment had reached approximately USD 2.4 trillion, accounting for 2.6% of the global GDP. Among major economies, R&D investment comprises 3.5% of GDP in the United States, 2.2% in China, 2.5% in Germany, and 3.1% in Japan. Capital markets play a crucial role as a source of funding for innovation. To strengthen this function and support high-quality enterprise development, many countries have implemented registration system reforms (Zhou *et al.*, 2018). However, owing to differences in market environments and development stages, the effects of these reforms on corporate development—especially innovations—have varied. In the United States and Japan, the adoption of the registration system helped capital markets nurture major technology giants such as Microsoft, Google, and Sony. In contrast, despite implementing similar reforms, India has experienced relatively slow progress in corporate innovation over nearly three decades (Krishnan and Prashantham, 2019).

The research explains this divergence from three main perspectives. First, capital market effectiveness theory emphasizes that the maturity, transparency, and liquidity of capital markets are essential for supporting innovation financing (Saada, 2025). The successful implementation of registration system reform in the U.S. and Japan is largely attributed to their well-developed and liquid capital markets. These market environments reduce information asymmetry, improve capital allocation efficiency, and provide stable funding for innovative enterprises (Qiu, 2022). In contrast, although India adopted similar reforms, its capital market still faces institutional shortcomings, including an underdeveloped regulatory framework, poor information disclosure, and weak investor protection. As a result, capital has often been misallocated, failing to support innovation financing effectively. This situation, in turn, limits long-term improvements in enterprise innovation capacity (Xiang *et al.*, 2022). Second, innovation ecosystem theory argues that technological innovation depends not only on individual firms but also on the coordinated interaction of several elements. These include policy support, talent availability, venture capital, R&D institutions, and the market environment (Song, 2023). While India has a relatively strong supply of technical talent, significant gaps exist in other areas. These gaps include a limited scale of venture capital, unstable policy frameworks, weak technology transfer mechanisms, and low levels of market development. These deficiencies have hindered the transformation of scientific research into commercial value, thereby limiting the realization of innovation potential (Arenal *et al.*, 2020). Third, path dependence theory suggests that the innovation capacity of a country is shaped by its historical institutional development and trajectory (Arend *et al.*, 2023). The United States and Japan, having enjoyed long periods of institutional stability and market development, have built mature systems that support innovation. These systems include strong intellectual property protection, comprehensive business incubation programs, and effective public–private collaboration. Such historical foundations have helped ensure the successful implementation of registration reforms and maximized their policy impact (Xin-gang, 2024). In contrast, although India has undergone frequent and wide-ranging reforms, its institutional environment remains unstable. Ongoing policy changes have prevented the establishment of a consistent innovation support system. This lack of continuity has weakened the long-term impact of policies on enterprise innovation and reinforced institutional inertia and path dependency (Martin & Sunley, 2006).

Unfortunately, most studies focus on cross-country systemic differences and lack in-depth analyses of the microlevel mechanisms through which registration reforms affect corporate innovation. Specifically, there are three gaps in the literature: (1) Most of the research adopts a macro perspective and fails to explore how registration reform influences innovation at the firm level. (2) The mediating role of investor behavior in capital allocation efficiency has been largely overlooked. (3) The complex relationships among registration reform, innovation outcomes, and investment efficiency remain unexplored. These limitations make fully explaining why identical systems can produce divergent outcomes difficult. To address these gaps, this study draws on information asymmetry theory and investor behavior theory. According to information asymmetry theory, a lack of transparency between firms and investors can hinder efficient capital allocation (Bergh *et al.*, 2019). Before the reform, firms underwent strict approval processes before going public. This procedure helps screen businesses with lower innovation potential. However, the reform simplified listing procedures, enabling faster access to the capital market. While the reform improved information disclosure, the reduced screening may have allowed weaker firms to list. These two trends—simplified procedures and increased transparency—can work at cross purposes, making accurate assessment of the innovation capability and investment value of a firm by investors more difficult. Under investor behavior theory, investment decisions are not purely rational. Instead, they are influenced by emotional responses, market sentiment, and institutional environments (Huynh *et al.*, 2020). While the reform enhanced market liquidity and transparency, it also encouraged short-term speculation among investors. This situation has introduced greater uncertainty regarding its actual impact on innovation. As an emerging market, China offers a unique context in which to examine these dynamics at the micro level. Understanding how the registration system reform affects innovation in Chinese enterprises forms the core research question of this study. To address this question, the following issues are investigated in this study via a difference-in-differences (DID) method under the frameworks of information asymmetry and investor behavior theories: (1) what is the actual impact of the registration system reform of China on corporate innovation? (2) Through what mechanisms does registration reform influence innovation activities? (3) What heterogeneous effects exist across different enterprise types, and what policy insights can be drawn?

The marginal contributions of this study are as follows: (1) this study expands the analytical framework for institutional research on capital markets, thereby providing methodological innovation for identifying the policy effects of registration system reform. Studies have focused mainly on the impact of the registration reform of the Science and Innovation Board on prelisting technology firms. However, such studies lack a precise evaluation of innovation behavior among existing A-share listed companies. This study addresses this gap by constructing a DID model based on the timing differences of the reforms implemented in the Growth Enterprise Market (GEM) and the Main Board. This approach enables the isolation of the net policy effect of the registration reform. In doing so, it overcomes the endogeneity problems caused by sample selection bias in traditional research. This methodological contribution offers a new framework for evaluating institutional changes in capital markets. (2) This study empirically reveals the “double-edged sword” effect of registration reform on investment efficiency, which deepens our understanding of capital allocation mechanisms in the context of corporate innovation. While the literature largely highlights the positive influence of registration reform on innovation investment, it often neglects the risks associated with inefficient investment. This study provides the first empirical evidence that registration reform, although it has expanded the overall scale of corporate investment, has significantly increased inefficient investment. This effect stems from heightened information asymmetry and an increase in short-term, speculative investor behavior. At the micro mechanism level, this finding reveals an institutional paradox: increased innovation input is accompanied by distorted resource

allocation. This insight offers a theoretical foundation for improving venture capital regulation and optimizing the development of a multitiered capital market. (3) This study constructs heterogeneous innovation response paths, which contribute to the differentiated design logic of institutional reform in emerging markets. By moving beyond the conventional approach of uniform policy analysis, this study explores how the impact of registration reform varies across firms and regions. The analysis is based on two key dimensions: regional financial ecosystems and firm valuation characteristics. The findings show that manufacturing firms, firms with high price-to-earnings (P/E) ratios, and firms located in more developed eastern regions are more likely to benefit from the reform. These insights support a spatial and firm-specific policy framework. They also offer a basis for the differentiated promotion of registration reform and for advancing industrial upgrading. Ultimately, the study contributes to the adaptive evolution of institutional economics in the context of emerging markets.

1. Theoretical Analysis and Research Hypotheses

From the perspectives of information asymmetry and investor behavior theories, registration system reform plays a vital role in improving market transparency and increasing investor confidence (Hu and Wang, 2023). Under this reform, firms must disclose detailed and transparent financial and operational information both before and after listing. This disclosure obligation enables market participants to better assess firm value and associated risks. Improved transparency strengthens investor trust and reduces information asymmetry in investment decisions. As a result, capital can be allocated more efficiently, enhancing the overall effectiveness and competitiveness of capital markets (Nguyen *et al.*, 2021). These improvements reduce both the time and economic cost of transforming business ideas into market-ready products. They also increase the ability of a firm to secure essential financial resources (Söderholm *et al.*, 2020). Greater efficiency in capital markets enhances their attractiveness, drawing more investor attention and increasing capital inflows. This effect is particularly significant for technology-driven start-ups. These firms benefit from broader access to funding and development opportunities enabled by registration system reform (Moisio and Rossi, 2020). In addition, a more favorable innovation environment is fostered by reduced information asymmetry, which intensifies market competition and facilitates interfirm technological exchange and collaboration (You *et al.*, 2021). Therefore, the enhancement of information transparency and the optimization of investor behavior are mutually reinforcing. Together, they improve capital market efficiency, support better resource allocation, and stimulate corporate innovation. Therefore, the following hypothesis is proposed in this study:

Hypothesis 1a: Registration system reform increases corporate innovation.

However, the reduction in information asymmetry has also had unintended consequences. One notable effect is the lowering of the listing threshold for enterprises. While the reform has improved market access efficiency by enabling more firms to enter the capital market, its potential drawbacks should not be overlooked. Registration system reform has resulted in greater emphasis on the volume of information disclosure and relaxed scrutiny of disclosure quality. This substitution effect—in which disclosure quantity replaces disclosure quality—has effectively reduced the listing threshold (Liu *et al.*, 2023). As a result, many firms with uneven innovation capabilities have entered the market. In such cases, noninnovative enterprises may consume a disproportionate share of market resources. This dynamic puts competitive pressure on firms with genuine innovation potential, limiting their market space and long-term investment in innovation. Moreover, while reduced information asymmetry can be beneficial, it may harm firms that rely on trade secrets and technological advantages (Simpson and Tamayo, 2020). Excessive disclosure requirements may increase the risk of leaking core technologies and commercial secrets. This exposure can weaken the competitive edge of a firm and discourage investment in high-risk,

high-reward innovation projects. As a result, capital may be inefficiently allocated. Instead, firms may pursue imitation strategies to quickly respond to market demands, neglecting sustained investment in innovation infrastructure (Dhingra, Morrow, 2019). This behavior suppresses genuine innovation activities. From the perspective of investor behavior theory, the reform has increased capital accessibility but has heightened financial volatility and market uncertainty (Alfaro *et al.*, 2024). These fluctuations distort investment behavior—not only among external investors but also within firms that act as innovation investors. For general investors, growing uncertainty can reinforce short-termism. This perspective makes them less willing to wait for the long-term returns of innovation investments and more focused on immediate financial results. Since meaningful innovation typically requires a long-time horizon to yield economic benefits, this shift in investor behavior can negatively impact corporate innovation. Similarly, for firms as innovation investors—especially those engaged in long-term R&D—frequent market volatility may hinder their ability to sustain long-term innovation efforts. Under pressure from fluctuating stock prices, management may prioritize short-term share performance over strategic investment in technological development. In summary, whether through the “threshold-lowering” effect—driven by the substitution of disclosure quality with quantity under information asymmetry theory—or through short-term investment preferences caused by volatility under investor behavior theory, the efficiency of innovation capital allocation is reduced, and corporate innovation is weakened. Therefore, the following hypothesis is proposed in this study:

Hypothesis 1b: Registration system reform reduces corporate innovation.

The acquisition of innovation capital by firms is closely linked to information exchange between enterprises and investors. The implementation of the registration system reform has simplified the process by which firms access capital markets. The reform has also reduced their reliance on financial institutions—especially banks—as intermediaries in information exchange. As a result, firms, driven by the need for more direct engagement with investors, are increasingly turning to capital markets. In particular, they are drawn to equity financing, which offers access to a higher concentration of “free capital.” Compared with indirect financing channels such as bank loans, equity financing is subject to fewer constraints. This flexibility allows firms to independently design long-term R&D and innovation strategies without being pressured by short-term return expectations. This shift helps reduce the risk of inefficient investment, including the tendency to overinvest in low-risk, low-return projects (Blondeel *et al.*, 2021). From the perspective of information asymmetry theory, the reduction in asymmetry caused by registration reform also introduces a monitoring effect (Cao *et al.*, 2020). Listed firms must regularly disclose detailed financial and operational data. This continual disclosure enhances external oversight and improves market transparency. The resulting scrutiny from investors and analysts pushes firms to strengthen internal governance, optimize resource allocation, and channel capital and talent into projects with genuine innovation potential and market competitiveness. Furthermore, improvements in information flow and market transparency enable the early identification and correction of inefficient investments (Hu and Wang, 2023). In such a transparent environment, every investment decision may be subject to close public and investor examination. This external pressure forces enterprises to adopt more reasonable and effective capital allocation strategies, and ultimately support innovation. From the viewpoint of investor behavior theory, firms—as recipients of capital—are also internal investors in innovation activities. Registration system reform can influence firms’ internal investment behavior. Specifically, reform may reshape the incentive structures within firms. In a more open and competitive capital market environment, corporate leadership is more likely to be evaluated on the basis of innovation outcomes. This dynamic motivates firms to prioritize forward-looking, high-risk innovation projects over conservative or capital-intensive initiatives. These behavioral changes improve the overall

efficiency of corporate investment decisions (Leppänen *et al.*, 2023). In summary, registration reform transforms the information disclosure environment and encourages deeper engagement with equity markets rich in “free capital.” This shift creates a strong incentive effect. The reform promotes more efficient investment behavior, reduces wasteful spending, and enhances the innovation performance of firms. Therefore, the following hypothesis is proposed in this study:

Hypothesis 2a: Human capital plays a significant mediating role in digital transformation’s influence on foreign trade firms’ exports.

The changes in the information environment induced by the registration system reform may generate a monitoring effect on firms. However, in the context of long-term strategies such as corporate innovation, this effect may also lead to several adverse consequences. First, the reform has imposed more stringent disclosure requirements. Firms are now expected to demonstrate greater transparency in their capital market behavior (Ho *et al.*, 2022). This heightened scrutiny may prompt firms to prioritize short-term performance to avoid negative market reactions resulting from financial opacity or underperformance in the short run. As a result, firms may tend to pursue projects with immediate financial returns. In contrast, projects that require long development cycles or significant long-term R&D investment may be neglected. This short-term orientation can dampen the motivation of firms to innovate, particularly in areas such as technological advancement and product development. A pattern of “focusing only on the immediate” may emerge. Firms may begin investing in projects that lack strategic value over the long term (Jover and Cocola-Gant, 2023). For example, excessive reliance on mergers and acquisitions (M&A) or financial engineering—especially when there is no strategic synergy—can result in inefficient capital use and resource waste. This behavior ultimately increases the level of inefficient investment. From the perspective of investor behavior theory, the market may still be immature in assessing the long-term potential of innovative firms. Under the registration system, investors often focus on short-term financial indicators and immediate market responses (Yang *et al.*, 2021). As a result, firms engaged in early-stage R&D—for which the returns are uncertain and delayed—may face pressure to delay or scale down their innovation activities. Moreover, the increased emphasis on transparency has improved investor access to corporate information compared with the pre-reform period. However, this advantage has also intensified disclosure competition among firms. To attract investor attention, companies may increase the volume of disclosure, which does not always lead to better information quality. In some cases, firms may engage in redundant disclosures, aggressive marketing, or promotional efforts. These behaviors can lead to unnecessary spending, inefficient investment, and crowding out funds that could be directed toward innovation (Hu *et al.*, 2024). Thus, on the one hand, the “incentive effect” of increased disclosure may encourage short-termism and inefficient investment. On the other hand, shifts in investor attention may pressure firms to engage in “cosmetic disclosure,” redirecting capital toward short-term image management rather than genuine innovation. In summary, whether due to increased pressure for short-term performance or distortions caused by disclosure-driven behavior, the outcome is the same: higher levels of inefficient investment and a decline in corporate innovation. Therefore, the following hypothesis is proposed in this study.

Hypothesis 2b: Registration system reform reduces corporate innovation by increasing inefficient investment.

2. Methodology

2.1 Sample Selection and Data Source

The registration systems for the GEM and the Main Board were implemented at different times. This creates a favorable quasi-natural experimental setting for empirical analysis. In this study, all A-share listed firms on the GEM and the Main Board from 2018 to 2022 were selected as the research sample. Firms listed on the GEM were designated the treatment group, whereas those listed on the Main Board served as the control group. The year 2020 was identified as the event time point to capture the treatment effect of the registration system reform. Firm-level financial data were collected from the China Stock Market & Accounting Research (CSMAR) and Wind databases. The raw data were processed using the following steps: (1) firms with severe missing values for key financial indicators were excluded; (2) ST, ST*, and PT firms were removed from the sample; and (3) firms operating in the financial and real estate sectors were also excluded. After processing, 2,886 valid firm-level observations were retained for analysis.

2.2 Modeling

To test *Hypothesis 1*, the following DID model was constructed:

$$RD_{i,t} = \beta_0 + \beta_1 Post_t \times Treat_i + \beta_2 Post_t + \beta_3 Treat_i + \sum_{j=4}^n \beta_j Control_{i,t} + \mu_i + \sigma_t + \varepsilon_{i,t} \quad (1)$$

where $RD_{i,t}$ denotes the innovation inputs of firms; $Post_t$ denotes a dummy variable for before and after implementation of the registration system on the GEM, with $Post_t = 0$ denoting the period before implementation of the registration system on the GEM, i.e., before 2020, and $Post_t = 1$ denoting the period after implementation of the registration system on the GEM, i.e., in 2020 and beyond; $Treat_i$ denotes the treatment group and the control group, with $Treat_i = 0$ when the sample firms belong to the Main Board and $Treat_i = 1$ when the sample firms belong to the GEM; $Control_{i,t}$ is a series of control variables; μ_i controls for individual fixed effects at the firm level of the model; σ_t controls for time fixed effects of the model; and $\varepsilon_{i,t}$ is the error term of the model.

2.3 Indicator Selection

2.3.1 Core Explanatory Variables

A DID model with the implementation of the registration system reform on the GEM as the core explanatory variable ($Post_t \times Treat_i$) was adopted in this study. The implementation of the registration system reform on the GEM in 2020—at which time a similar reform had not yet been adopted on the Main Board—provided the foundation for selecting this policy as the core explanatory variable. GEM- and Main Board-listed firms were treated as the treatment and control groups, respectively, with 2020 designated as the event time. This setting allowed effective application of the DID method to estimate the impact of the GEM registration reform on corporate innovation. In addition, using the treatment effect of the GEM reform as the core explanatory variable, it helps mitigate potential endogeneity concerns to some extent (Sima, 2023).

2.3.2 Explained Variables

To measure corporate innovation, R&D investment (*RD*) was selected as the primary indicator. The data were smoothed by taking the natural logarithm of R&D expenditures. There are two main reasons for choosing R&D investment. First, it more directly reflects the actual efforts and resources that firms devote to innovation activities. Compared with patent counts, R&D spending offers a more objective assessment of both the depth and breadth of technological innovation. This choice is especially important given the significant variation in patent quality and value across firms. Such differences may limit the effectiveness of patent counts in fully capturing the innovative capabilities of a firm (Chalioti *et al.*, 2020).

Second, intangible assets encompass more than just patents. They also include land use rights, trademarks, copyrights, and non-patented technologies. These assets cover a broad range and are complex to evaluate. Moreover, the extent to which different types of intangible assets contribute to corporate innovation significantly varies and is difficult to generalize (Van *et al.*, 2022). For this reason, R&D investment was the primary proxy for corporate innovation used in this study. This choice allows a more accurate assessment of the impact of the registration system reform on the innovative capacity of firms. Intangible assets were included only in robustness checks, serving as a supplementary indicator. In summary, log-transformed R&D investment was adopted as the main measure of corporate innovation. This variable provides a clearer reflection of the actual inputs and efforts that firms dedicate to technological advancement. This approach enables a more rigorous investigation into the substantive effects of the registration system reform on enterprise innovation.

2.3.3 Control Variables

Control variables related to the financial indicators and characteristics of firms were included to account for structural differences between GEM and Main Board firms. First, firm size (*Size*) was controlled for. Firm size influences innovation investment through differences in resource endowments and organizational structures. Larger firms generally have higher cash flows, access to financing channels, and established R&D infrastructure (e.g., laboratories and patent portfolios). However, hierarchical decision-making in large firms may reduce innovation efficiency. Controlling for firm size helps eliminate the “scale effect,” thereby avoiding the misattribution of reform impacts to natural economies of scale (Zhou and Li, 2023). Second, financial leverage (*Lev*) was controlled for. Leverage reflects the reliance of a firm on debt financing, which directly affects its ability to fund R&D. High leverage can inhibit innovation in two ways: interest obligations may crowd out R&D budgets, and creditors’ risk aversion may restrict high-risk innovation projects. By controlling for leverage, the positive effects of equity financing are separated from the constraints imposed by debt in the model (Brown *et al.*, 2021). Third, profitability (*ROA*) was included as a control. ROA reflects internal capital sufficiency. According to pecking order theory, profitable firms may prefer to finance innovation with internal resources, reducing their reliance on external capital. However, high profitability could also lead to managerial complacency and weaker innovation incentives. Controlling for ROA helps address potential endogeneity arising from the internal financing capacity (Kyaw, Khatri, 2024). Fourth, firm age (*Age*) was controlled for, in line with firm life cycle theory. Younger firms tend to pursue exploratory innovation, whereas mature firms focus more on exploitative strategies. Older firms may also experience organizational rigidity and path dependence. Controlling for age prevents conflating the reform effects with differences related to firm maturity (Coleman-Belin *et al.*, 2023). Fifth, equity concentration (*EC*) was included to account for ownership structure. A high ownership concentration can reduce agency costs through tighter oversight but may also reflect risk aversion by dominant shareholders, who may avoid long-term R&D investments.

Controlling for EC isolates the impact of registration reform on governance-related innovation dynamics (Lizares, 2022). Sixth, CEO–chairperson duality (*Dual*) was controlled for. Duality indicates centralized decision-making authority. While it may enhance decision efficiency in innovation, it can also increase excessive risk-taking due to weakened checks and balances. Controlling for duality helps exclude structural biases introduced by managerial power concentration (He *et al.*, 2021). Seventh, state ownership (*SOE*) was included to reflect the nature of firm ownership. State-owned enterprises may prioritize political objectives, such as employment stability, over innovation. In contrast, non-SOEs tend to be more responsive to competitive market forces. Controlling for ownership type allows the identification of heterogeneous effects of the reform across different ownership structures (Djankov, 2022). Eighth, analyst coverage (*Analyst*) was controlled for. Analysts serve as information intermediaries and influence corporate behavior. Greater analyst attention may encourage short-termism, leading firms to cut R&D to meet earnings expectations. Conversely, it may reduce information asymmetry and attract external capital to support innovation. Controlling for this variable isolates the monitoring role of capital markets (Bechlioulis *et al.*, 2023). Ninth, the book-to-market ratio (*BTM*) was included to capture growth opportunities. A high *BTM* (value-oriented firms) often indicates growth stagnation, which may push firms to innovate. A low *BTM* (growth-oriented firms) may suggest less pressure to innovate, as future growth is already priced in. Controlling for *BTM*, it helps separate growth-stage effects from innovation behavior (Barros *et al.*, 2021). Finally, stock return (*Return*) was controlled for. Stock return reflects market expectations of future cash flows. High-return firms may have easier access to capital through equity issuance, potentially funding more innovation. However, under the market pressure hypothesis, such firms may reduce long-term R&D to meet investor expectations. Controlling for returns helps eliminate noise caused by market performance when assessing innovation decisions (Yang, 2022). The definitions and measurements of all the key variables are summarized in *Table 1*.

Table 1. Variable definitions

Variable code	Variable name	Calculation method
<i>RD</i>	Enterprise innovation	Natural logarithm of the innovation inputs of firms
$Post_i \times Treat_i$	Registration system reform	$Post_i = 0$ denotes before 2020; $Post_i = 1$ denotes 2020 and beyond; when $Treat_i = 0$, the sample firm belongs to the Main Board; when $Treat_i = 1$, the sample firm belongs to the Growth Enterprise Market (GEM)
<i>Size</i>	Company size	Natural logarithm of total assets at the end of the period
<i>Lev</i>	Financial leverage	Total liabilities at the end of the period/total assets at the end of the period
<i>ROA</i>	Profitability	Net profit for the period/total assets at the end of the period
<i>Age</i>	Age of business	Natural logarithm of the total number of years on the market
<i>EC</i>	Shareholding concentration	Shareholding ratio of the largest shareholder
<i>Dual</i>	Two jobs in one	Whether the chairperson and general manager are the same person
<i>SOE</i>	Nature of property rights	1 for state-owned enterprises; 0 for nonstate-owned enterprises
<i>Analyst</i>	Analyst focus	Natural logarithm of the number of analysts producing analytical reports plus one
<i>BTM</i>	Book-to-market ratio	Net book assets/market capitalization
<i>Return</i>	Stock return	(Year-end share price - year-beginning share price)/year-beginning share price

Source: authors' own results.

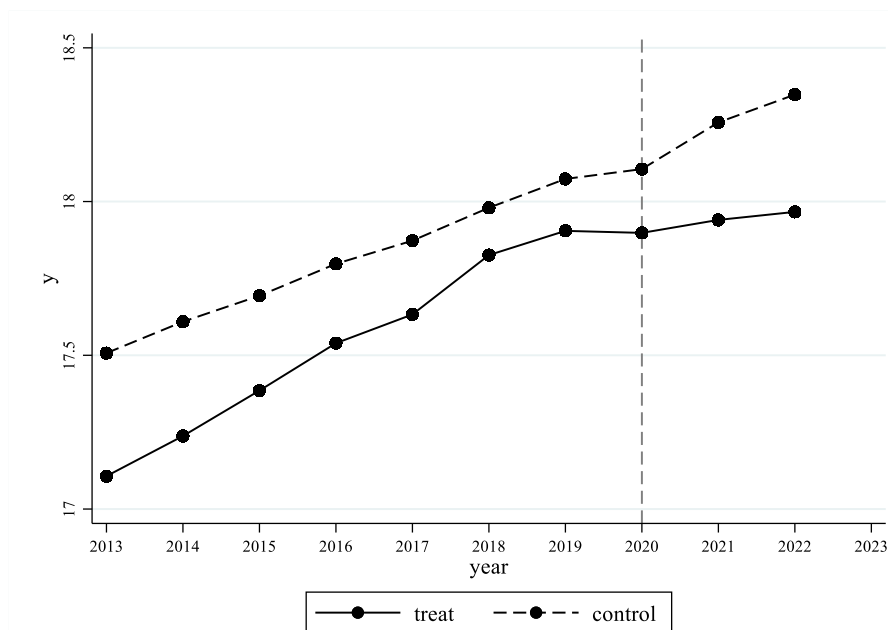
2.4 Data Description and Descriptive Statistics

The descriptive statistics of the variables are presented in *Table 2*. The results show that the logarithmized value of enterprise innovation input ranges from a minimum of 7.72 to a maximum of 24.63, with a mean of 18.05, a median of 18.02, and a standard deviation of 1.558. These figures indicate that innovation input is relatively concentrated on the logarithmic scale. The overall distribution appears stable. However, the large gap between the minimum and maximum values reflects a high degree of variability in innovation input across firms.

Table 2. Descriptive statistics

Variable	N	Min	Mean	Median	SD	Max
<i>RD</i>	19656	7.720	18.05	18.02	1.558	24.63
<i>Post</i>	21891	0	0.653	1	0.476	1
<i>Treat</i>	19188	0	0.248	0	0.432	1
<i>Size</i>	21352	16.41	22.18	21.99	1.435	30.04
<i>Lev</i>	21352	0.00800	0.435	0.403	1.282	178.3
<i>ROA</i>	21352	-30.69	0.0210	0.0390	0.400	7.446
<i>Age</i>	20084	0	2.023	2.197	0.985	3.497
<i>EC</i>	20807	0.0180	0.326	0.301	0.147	0.900
<i>Dual</i>	20152	0	0.337	0	0.473	1
<i>SOE</i>	21891	0	0.265	0	0.441	1
<i>Analyst</i>	11491	0.693	1.935	1.792	0.962	4.331
<i>BTM</i>	20469	0.00900	0.652	0.657	0.256	1.601
<i>Return</i>	19344	-0.950	0.0460	-0.0470	0.512	14.24

Source: authors' own results.



Source: authors' own results.

Figure 1. Trends in the Innovation Inputs of Firms

Figure 1 illustrates the trend in the innovation input of firms over time. Before the implementation of the registration system reform on the GEM in 2020, both the experimental group (GEM firms) and the control group (Main Board firms) followed similar trajectories. Each group showed a gradual upward trend, indicating the presence of a parallel trend. However, after the reform was introduced in 2020, the innovation input of firms in the experimental group significantly declined relative to that in the control group. This observation provides preliminary support for H1b.

3. Result Analysis

3.1 Testing of Hypotheses 1a and 1b

The results of the test for Hypothesis 1 are presented in Columns (1)–(4) of Table 3, under progressively stricter model specifications. The control conditions were set as follows: (1) no fixed effects and no control variables; (2) inclusion of individual fixed effects but no time fixed effects or control variables; (3) inclusion of both individual and time fixed effects without control variables; and (4) inclusion of individual and time fixed effects, along with control variables. Across all of the model settings, the coefficient of the treatment effect of the registration system reform remains significantly negative at the 1% level. This finding indicates that the observed decline in corporate innovation following the reform is robust across different specifications. The result is consistent with the expectations of H1b.

Table 3. Impact of the registration reform on firm innovation

Variable	(1)	(2)	(3)	(4)
	<i>RD</i>	<i>RD</i>	<i>RD</i>	<i>RD</i>
$Post_i \times Treat_i$	-0.0788*** (0.0232)	-0.0752*** (0.0235)	-0.0747*** (0.0234)	-0.0547** (0.0213)
Constant	17.84*** (0.0327)	17.92*** (0.00722)	17.84*** (0.0104)	1.834* (1.081)
Observations	17,375	17,375	17,375	9,148
R-squared	0.101	0.101	0.162	0.441
Number of Code	4,098	4,098	4,098	2,886
Code FE	NO	YES	YES	YES
Time FE	NO	NO	YES	YES
Else	NO	NO	NO	YES

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' own results.

3.2 Robustness Test

3.2.1 Parallel Trend Test

To more rigorously test whether Model (1) satisfies the parallel trend assumption, the dynamic analysis approach proposed by Amore *et al.* (2013) was adopted in this study. Building on the baseline specification, the model incorporated interaction terms between the treatment group and time dummy variables for the two years before and after implementation of the GEM registration system reform. The model was specified as follows:

$$RD_{i,t} = \beta_0 + \sum_{n=1}^2 \gamma_n Pre_{i,t}^n + \beta_1 current_{i,t} + \sum_{n=1}^2 \delta_n Post_{i,t}^n + \sum_{j=2}^n \beta_j Control_{i,t} + \mu_i + \sigma_t + \varepsilon_{i,t} \quad (2)$$

where $Pre_{i,t}^n$ is a dummy variable corresponding to the cross-multiplier of the dummy variable of the prebenchmark year and the experimental group, $current_{i,t}$ is the cross-multiplier of the dummy variable of the benchmark year and the experimental group, and $Post_{i,t}^n$ is a dummy variable corresponding to the cross-multiplier of the dummy variable of the postbenchmark year and the experimental group. If the estimated coefficients of the core explanatory variables are significantly negative before implementation of the registration system on the GEM, then the original estimation results may be biased. Such a bias could arise from interference by unobservable factors. Conversely, if no significant pretreatment effects are observed, then the subsequent decline in the innovation input of firms can be attributed to registration system reform with greater confidence.

Table 4 presents the results of the parallel trend test. The coefficient estimates of the time dummy variables for the years before the implementation of the registration system reform on the GEM are statistically insignificant. This result indicates that the sample satisfies the parallel trend assumption. In other words, before the reform, the innovation inputs of the GEM and the Main Board firms did not significantly differ. In contrast, the coefficient estimates for the years after the reform are significantly negative, which further confirms the robustness of the study findings.

Table 4. Parallel trend test

Variable	(1)
	RD
Pre^2	0.0145 (0.0268)
Pre^1	0.0208 (0.0196)
$Post^1$	-0.0607*** (0.0189)
$Post^2$	-0.0644*** (0.0245)
Constant	1.779 (1.084)
Observations	9,148
Number of Stkcd1	2,886
R-squared	0.442
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' own results.

3.2.2 Placebo Test

In addition to the impact of the GEM registration system reform, firm behavior may also have been influenced by other unobservable factors. To address this possibility, a placebo test was conducted. Specifically, a year different from the actual policy implementation year was selected as a hypothetical event year, and the same empirical strategy as that used in the main analysis was applied. If the interaction term in the placebo test is significant and consistent with the main results, this would suggest that the observed effect could occur even without the policy. This outcome would indicate a potential

bias and a failure of the placebo test. Conversely, if the placebo results are insignificant, this would suggest that the treatment effect estimated from the main analysis might not exist in the absence of the actual policy, i.e., the placebo test is passed. To ensure that the macroeconomic environment was comparable to that of the actual event, the year 2019—immediately preceding the real policy implementation in 2020—was chosen as the hypothetical treatment year. The years 2016–2018 were defined as the placebo pretreatment period, and the years 2019–2022 were defined as the placebo posttreatment period. All other model specifications remained consistent with those of Model (1). The results, shown in *Table 5*, indicate that none of the regression coefficients on the *Post* × *Treat* interaction term are statistically significant. This finding suggests that the treatment effect identified in the main analysis does not appear without the actual policy intervention. Therefore, the placebo test is passed, providing further support for the robustness of *Hypothesis 1*.

Table 5. Placebo test

Variable	(1)
	<i>RD</i>
<i>Post</i> × <i>Treat</i>	-0.0325 (0.0235)
Constant	1.331 (0.838)
Observations	12,670
Number of Stkcd1	3,260
R-squared	0.497
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' own results.

3.2.3 Changing the Definitions of the Key Variables

In this study, intangible assets were used as an alternative proxy to measure firm innovation (Zhang *et al.*, 2022). The regression results based on this modified innovation indicator are presented in *Table 6*.

Table 6. Regression results after changing the main variable definitions

Variable	(1)
	<i>Intangible assets</i>
<i>Post_t</i> × <i>Treat_t</i>	-0.413*** (0.0914)
Constant	-21.70** (8.815)
Observations	9,565
Number of Stkcd1	2,994
R-squared	0.042
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' own results.

The estimated coefficient of the core explanatory variable, $Post_t \times Treat_i$, remains significantly negative at the 1% level, which confirms the robustness of the benchmark regression results.

3.2.4 Controlling for the Impact of the COVID-19 Pandemic

The outbreak of the COVID-19 pandemic coincided with the implementation of the registration system reform on the ChiNext board. As a result, the decline in corporate innovation observed in the baseline regression may have been influenced by the pandemic shock rather than the reform itself. To isolate this potential confounding effect, Model (1) was re-estimated using a subsample of firms in the healthcare industry. This sector was most likely to exhibit innovative responses during the pandemic period (Smith *et al.*, 2021). The regression results are reported in Table 7. The coefficient estimate of $Post_t \times Treat_i$ is statistically insignificant, indicating that the reform did not have a positive effect, even in the healthcare sector. This finding indirectly rules out COVID-19 as the primary cause of the observed decline in innovation. Therefore, these findings support the validity of the identification strategy of this study.

Table 7. Controlling for the impact of the COVID-19 pandemic

Variable	(1)
	RD
$Post_t \times Treat_i$	0.0566 (0.0722)
Constant	1.289 (3.339)
Observations	572
Number of Stkcd1	173
R-squared	0.542
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1..

Source: authors' own results.

4. Further Analysis

4.1 Mechanism Test—Impact of Inefficient Investment

As outlined in the preceding theoretical analysis, the registration system reform may reduce corporate innovation by crowding out R&D inputs through an increase in inefficient investment. On the basis of prior research, an indicator was constructed to measure the degree of inefficient investment. The estimation results are presented in Table 8. The coefficient estimates of the core explanatory variable $Post_t \times Treat_i$ is significantly positive at the 5% level. This result indicates that the registration reform led to an increase in the inefficient investment of firms, thereby diverting resources that would otherwise support innovation activities (Pan *et al.*, 2022). This finding provides empirical support for Hypothesis H2a.

Table 8. Mechanism test—impact of inefficient investment

Variable	(1)
	<i>InefficInvestSign</i>
$Post_i \times Treat_i$	0.0544* (0.0304)
Constant	-1.270** (0.639)
Observations	8,849
Number of Stkcd1	2,778
R-squared	0.012
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' own results.

To further demonstrate that the decline in corporate innovation was driven by the increase in inefficient investment, the effect of the registration system reform on total firm investment was also examined in this study. As shown in *Table 8*, the reform significantly increased total investment in the experimental group. However, when these results are considered alongside the earlier results presented in *Table 7*, the increase in total investment was largely offset by the growth in inefficient investment. As a result, firm innovation—measured by R&D expenditures—did not improve. This finding provides additional support for the validity of H2a.

Table 9. Mechanism test—total business investment

Variable	(1)
	<i>lnTotalInvest</i>
$Post_i \times Treat_i$	0.0870* (0.0466)
Constant	-12.45*** (1.581)
Observations	8,543
Number of Stkcd1	2,745
R-squared	0.225
Code FE	YES
Time FE	YES
Else	YES

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' own results.

4.2 Heterogeneity Analysis

4.2.1 Industry Heterogeneity

Given the differences in capital dependence, the pace of market and technological changes, disclosure requirements, and managerial and strategic adaptability across industries, the impact of the registration system reform on corporate innovation may vary by sector. In this study, sample firms were classified into two groups, manufacturing and non-manufacturing, on the basis of the industry type. Separate regressions were conducted for each group. The results are presented in Columns (1) and (2) of *Table 9*.

The findings show that the estimated coefficient of $Post_i \times Treat_i$ is statistically insignificant in the manufacturing group but significantly negative in the non-manufacturing group. This industry heterogeneity may be explained by several factors. The first factor is capital dependence. Manufacturing industries typically require large-scale fixed capital investment. They also have longer innovation cycles and slower capital returns. As a result, their R&D and innovation strategies are generally less responsive to capital market fluctuations. In contrast, non-manufacturing industries, particularly those in the service sector, rely more heavily on rapid capital turnover and short-term market feedback. This reliance makes them more sensitive to changes in market conditions (Jia *et al.*, 2020). The second factor is the pace of market and technological changes. Market and technological evolution tend to be slower in manufacturing than it is in non-manufacturing sectors. Therefore, manufacturing firms are less likely to adjust long-term innovation strategies in response to registration reform. In contrast, non-manufacturing firms, which are highly responsive to market signals, may shift their focus toward short-term performance, potentially at the expense of sustained innovation investment (Bouis *et al.*, 2020). The third factor is investor preferences. After the reform, capital market preferences may shift toward sectors that promise rapid growth and quick returns. These features are often found in non-manufacturing industries such as internet services. As a result, long-term, delayed-return innovation projects in manufacturing may be undervalued. This shift could incentivize non-manufacturing firms to prioritize short-term investor expectations over genuine innovation (Han *et al.*, 2021). The fourth factor is strategic flexibility and management structure. Manufacturing firms, owing to their capital intensity and technological complexity, tend to adopt strategies that are more cautious and stable. Nonmanufacturing firms, by contrast, operate with greater flexibility and are more adaptable to market changes. While this agility can be advantageous, it may lead to fragmented innovation strategies and an increase in inefficient investment (Das and Canel, 2023).

Table 10. Heterogeneity analysis—industry heterogeneity

Variable	(1)	(2)
	RD	RD
$Post_i \times Treat_i$	-0.0108 (0.0222)	-0.148*** (0.0498)
Constant	2.295*** (0.772)	0.987 (2.848)
Observations	6,436	2,712
R-squared	0.548	0.350
Number of Stkcd1	1,993	893
Code FE	YES	YES
Time FE	YES	YES
Else	YES	YES

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' own results.

4.2.2 Regional Heterogeneity

Regional heterogeneity in economic development, capital market dependence, regulatory environments, and social capital may lead to differentiated effects of the registration system reform on corporate innovation. Following prior research (Shen *et al.*, 2021), the sample firms were divided into two regional subgroups on the basis of firm location: eastern and non-eastern. Separate regressions were conducted for each subgroup. The results are reported in Columns (1) and (2) of Table 9. The results show that the

estimated coefficient of $Post_i \times Treat_i$ is significantly negative for firms in the eastern region, whereas it is statistically insignificant for firms in non-eastern regions. Several factors may explain this regional disparity. The first factor is differences in economic development. Compared with the central and western regions, the eastern region of China generally has higher levels of economic development, stronger industrial agglomeration, and more mature financial markets (Fu *et al.*, 2022). Firms in eastern China tend to rely more heavily on capital markets and face greater competitive pressure. The registration reform may have intensified financial and market demands in these areas, prompting firms to shift their focus from long-term R&D investment to short-term market performance and shareholder expectations. In contrast, firms in less developed regions often depend more on internal financing or government subsidies. As a result, such firms may be less sensitive to the institutional and market changes brought about by the reform. The second factor is variations in market and regulatory environments. Compared with non-eastern regions, the eastern region features a more advanced and competitive market environment, along with stricter regulatory standards. Firms in this region often need to allocate significant resources to comply with disclosure and regulatory requirements. This burden may constrain their capacity to invest in innovation and R&D (Shao *et al.*, 2022). In contrast, firms in non-eastern regions typically operate under lighter regulatory pressure, allowing for more flexible resource allocation. This situation may partially shield their innovation activities from the effects of the registration reform.

Table 11. Heterogeneity analysis—regional heterogeneity

Variable	(1)	(2)
	RD	RD
$Post_i \times Treat_i$	-0.0526** (0.0235)	-0.0701 (0.0486)
$Post$	0.467*** (0.0477)	0.571*** (0.0920)
Constant	2.218*** (0.834)	1.980 (2.619)
Observations	6,650	2,498
R-squared	0.477	0.398
Number of Stkcd1	2,106	790
Code FE	YES	YES
Time FE	YES	YES
Else	YES	YES

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' own results.

4.2.3 P/E ratio Heterogeneity

Firms were classified based on the median industry–year P/E ratio. Those firms with P/E ratios above the median were identified as high P/E firms, whereas those with P/E ratios below the median were classified as low P/E firms. The regression results show that the estimated coefficients for high P/E firms are statistically insignificant, whereas those for low P/E firms are significantly negative. Several factors may account for this finding. (1) The first factor is market valuation and innovation potential. The goal of registration system reforms is to enhance market transparency and improve resource allocation efficiency (Nguimkeu and Okou, 2021). High P/E firms are often already well regarded by the market, likely because of their demonstrated innovation capacity or growth prospects. As a result, the reform had

a limited additional impact on these firms, which already had strong access to capital and could maintain innovation activities. (2) The second factor is the financing constraints on low P/E firms. Low P/E firms are typically viewed as having weaker growth potential (Park, 2021). The increased transparency under the reform may further highlight their financial vulnerabilities, leading to higher financing costs and restricted access to capital for innovation. (3) The third factor is increased regulatory pressure. The reform may have increased compliance burdens across the board, but firms with lower P/E ratios and weaker performance are likely to feel this pressure more acutely (Pernell, 2020). This added pressure may have caused managers to prioritize short-term financial results over long-term R&D investment. (4) The fourth factor is investor preference shifts. The reform may have influenced investor behavior by encouraging a preference for high P/E firms, which are perceived as safer or more promising (Nukala and Prasada Rao, 2021). Consequently, low P/E firms may have struggled to attract the external funding needed to support innovation. (5) The fifth factor is strategic conservatism. In response to the reform-driven market environment, managers of low P/E firms may adopt more conservative business strategies. Their focus may shift toward operational stability rather than the pursuit of potentially risky innovation initiatives.

Table 12. Heterogeneity analysis—P/E heterogeneity

Variable	(1)	(2)
	RD	RD
$Post_t \times Treat_i$	0.000983 (0.0357)	-0.0739** (0.0288)
Constant	1.443 (1.081)	2.687 (1.797)
Observations	4,187	4,961
R-squared	0.403	0.492
Number of Stkcd1	2,019	1,943
Code FE	YES	YES
Time FE	YES	YES
Else	YES	YES

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' own results.

5. Discussions

First, does the registration system reform—despite significantly improving the capital market financing environment—necessarily lead to positive expectations for corporate innovation? Registration system reform is widely recognized to enhance the financing environment, broaden financing channels, and reduce information asymmetry (Hu *et al.*, 2019). On the basis of the literature grounded in information asymmetry and investor behavior theories, such reform is generally expected to promote corporate innovation (Lin, 2020). According to information asymmetry theory, the traditional approval system requires firms to navigate cumbersome administrative procedures. Limited disclosure often restricts investors' understanding of firm operations and innovation potential (Liu *et al.*, 2021). In contrast, the registration system mandates more transparent financial and operational disclosures. This situation improves investor access to firm-specific innovation data. By disclosing key indicators—such as R&D investment, technological advancements, and market performance—firms allow investors to better assess innovation potential, facilitating more efficient capital allocation. Investor behavior theory suggests that investors adjust their valuations and decisions on the basis of signals such as R&D intensity, innovation strategy, and technological leadership (Wang *et al.*, 2022). These expectations encourage firms to increase innovation input to meet capital market demands, thereby enhancing

innovation capabilities. However, the findings from this study on China's A-share market indicate that these theories may manifest differently in emerging markets, potentially leading to a decline in corporate innovation. From the perspective of information asymmetry, firms often rely on technological barriers and trade secrets to maintain competitive advantages (Hannah *et al.*, 2019). The increased disclosure requirements under the registration system may reveal sensitive information—such as core technologies, R&D progress, and strategic positioning—especially when innovations are in early development stages. Excessive transparency can enable imitation by competitors, thereby reducing the incentives of firms to innovate. From the perspective of investor behavior, regular mandatory disclosures shift investor attention not only to long-term strategies but also heavily toward short-term financial performance and stock price volatility (Schoenmaker and Schramade, 2019). As a result, firms may feel greater pressure to deliver immediate returns. This pressure can lead management to scale back on long-term R&D projects in favor of short-term outcomes. This theoretical interpretation is supported by the mechanism analysis of this study, which showed that although the reform increased total investment, it also resulted in higher levels of inefficient investment. This situation ultimately crowded out innovation inputs. The findings provide empirical evidence that revised interpretations of information asymmetry and investor behavior theories are necessary to explain how registration system reform, under certain conditions, may actually reduce corporate innovation. Therefore, H1b and H2b are supported, which aligns with the conclusions of Hannah *et al.* (2019).

Second, is the negative impact of the registration system reform on corporate innovation manageable? Is there room for mitigation? The heterogeneity analysis suggests that not all firms experienced a decline in innovation following the implementation of the reform. This finding indicates that the adverse effects of the registration system on corporate innovation are not universal and can be mitigated through strategic adjustments and thoughtful policy design. Specifically, the reform was found to have a significantly negative effect on innovation among non-manufacturing firms, firms located in the eastern region, and firms with low P/E ratios. In contrast, it had no significant effect on manufacturing firms, non-eastern firms, or high P/E firms. Notably, many of these unaffected firms—particularly those in manufacturing, in less developed regions, and with strong market valuations—are also the primary targets of national innovation policy support. Therefore, the overall negative impact of the reform appears to be manageable rather than systemic. When the underlying heterogeneity mechanisms are identified, targeted remedial strategies can be developed for the most affected groups. For example, for nonmanufacturing, eastern region, and low P/E firms—those most vulnerable to short-term financial and market pressures—the following policy recommendations can be proposed: strengthen long-term, innovation-oriented market guidance; optimize the information disclosure framework to balance transparency with the protection of strategic innovation assets; reduce excessive short-term performance pressures on management; provide policy-based financial incentives for long-horizon innovation projects; establish a scientific and forward-looking innovation performance evaluation system; promote internal strategic resilience through corporate governance reform; and cultivate a stronger base of long-term institutional investors in the capital market. These approaches can help compensate for the decline in innovation input among negatively affected enterprises. They also ensure that the registration system reform continues to sustainably and inclusively support innovation. Ultimately, achieving these goals depends on the long-term institutional development of the capital market of China (Zou and Othman, 2024).

Conclusions and Implications

Conclusions

On the basis of the asynchronous implementation of the registration system reform on the GEM and the Main Board of the China A-share market, a DID method was employed in this study. Using data from 2,886 listed firms, the impact and underlying mechanisms of the reform on corporate innovation were examined. A heterogeneity analysis was also conducted to explore variations across different firm groups. The following conclusions were drawn: (1) the registration system reform has not achieved its intended goal of promoting corporate innovation. Instead, it has had a significantly negative effect. Innovation activities notably declined after the reform, a trend that appears to be closely linked to the increased information transparency and heightened short-term investor behavior triggered by the reform. (2) Inefficient investment has been identified as the main channel through which the registration system reform suppresses innovation. Although the reform led to an increase in the overall investment levels of firms, much of this additional investment has been inefficient. As a result, resources have been misallocated, and R&D input remains insufficient, ultimately hindering innovation activities. (3) The impact of the registration reform on innovation significantly varies across firm types. The negative effects are more pronounced among non-manufacturing firms, firms located in eastern regions, and those with low P/E ratios. In contrast, manufacturing firms, non-eastern firms, and high P/E firms did not experience a statistically significant decline in innovation. These findings suggest that the adverse effects are localized and manageable, offering useful insights for targeted policy interventions.

Managerial Implications

The findings of this study yield the following managerial implications.

- (1) The institutional framework of the capital market should continue to be refined, and a more accurate policy evaluation mechanism should be established. The relevant authorities should enhance the dynamic monitoring and assessment of the registration system reform. Regular policy reviews should be conducted to support timely institutional adjustments. Special attention should be given to regulating disclosure standards and investor behavior. The goal is to maintain market transparency while avoiding overregulation, which may encourage short-termism. These efforts are essential to ensure that the reform continues to align with and support the long-term innovation goals of enterprises.
- (2) Capital allocation should be optimized, and market funds should be guided toward innovative sectors. Regulatory bodies are encouraged to strengthen investor education and guidance to foster a more rational and mature investment environment. Through policy incentives and adjustments in market mechanisms, long-term capital should be directed toward enterprises with genuine innovation potential. This approach would help curb short-term speculation, reduce the risk of inefficient investment, and enhance the overall capital allocation efficiency.
- (3) Differential innovation support policies should be implemented to provide targeted assistance for key enterprise groups. For firms more adversely affected by the reform—such as non-manufacturing firms, firms in eastern regions, and those with low P/E ratios—tailored support measures should be introduced. Such measures may include tax incentives, the creation of dedicated R&D subsidy funds, or the development of innovation support platforms. Such measures would help alleviate short-term financial pressure and ensure sustained investment in innovation activities.
- (4) The design of the information disclosure framework should be enhanced to balance technological innovation and information protection. While promoting greater transparency in the capital market,

regulatory authorities must establish exemption mechanisms for information disclosure to protect core technologies and trade secrets. For innovation-driven firms in early R&D stages or those possessing critical technical know-how, a degree of flexibility in disclosing sensitive information should be allowed. This would help prevent the loss of a competitive advantage due to unnecessary exposure and ensure that the innovative potential of a firm is preserved under evolving disclosure requirements.

Limitations and Future Directions

This study is subject to several limitations. First, there is a constraint related to the sample time window. Owing to the timing of the registration system reform, the dataset includes only two years of post-reform firm performance, so capturing the long-term and dynamic effects of the policy is difficult. Given the typical time lag in corporate innovation activities, the crowding-out effect of inefficient investment may follow nonlinear patterns over time. Future research could address this constraint by incorporating data from the STAR Market pilot, thus extending the observation period to 5–10 years, and applying a dynamic panel model to assess the sustained impact of the reform. Second, the measurement of innovation of this study lacks multidimensionality. While R&D investment is used as the primary indicator, it does not distinguish between exploratory and exploitative innovation, nor does it include qualitative dimensions such as patent citation rates or the revenue share from new products. Future research may consider employing textual analysis techniques to extract innovation-related keywords from annual reports or constructing a composite index that better reflects differences in innovation quality.

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REGISTRACIJOS REFORMOS INOVACIJŲ PARADOKSAS: NEVEIKSMINGO INVESTICIJŲ TARPININKAVIMO EFEKTAI IR NEVIENODAS ĮMONIŲ ATSAKAS

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Santrauka. Registracijos sistemos reforma siekiama optimizuoti išteklių paskirstymą ir paskatinti rinkos dinamiką. Daug šalių savo kapitalo rinkose ją pritaikė kaip pagrindinę institucinę naujovę. Tačiau neaišku, ar tokia reforma veiksmingai skatina įmonių naujoves, ypač įvairiose įmonėse. Siekta ištirti registracijos reformos inovacijų paradoksą, remiantis informacijos asimetrijos ir investuotojų elgsenos teorijomis bei naudojant Kinijos A akcijų augimo įmonių rinkos (GEM) ir pagrindinės valdybos įmonių duomenis nuo 2018 iki 2022 m. Pritaikius skirtumų skirtumo metodą (D-ID) išanalizuotas reformos poveikis, pagrindiniai mechanizmai ir nevienalytis poveikis inovacijoms. Rezultatai atskleidė, kad registravimo sistemos reforma neskatina įmonių inovacijų taip kaip tikėtasi. Nors dėl reformos padidėjo bendros įmonės investicijos, didžioji dalis šių papildomų investicijų yra neveiksmingos. Dėl to sumažėjo bendras įmonių inovacinis pajėgumas. Ši išvada patvirtina, kad neefektyvios investicijos veikia kaip tarpinis veiksnys, per kurį reforma silpnina įmonių inovacijas. Tolesnė analizė atskleidžia reikšmingus reformos poveikio skirtumus. Neigiamas poveikis ryškiausias negamybinėms įmonėms, įmonėms, esančioms rytiniame regione, ir įmonėms, kurių kainų ir pajamų santykis žemas. Kitų tipų įmonėms poveikis nereikšmingas. Šiame tyrime pabrėžiamos nenumatytos registravimo sistemos reformos pasekmės įmonių inovacijoms, ypač kai investicijų efektyvumas nepagerėja. Šio tyrimo metu gautos išvados prisideda prie teorinio inovacijų supratimo ir leidžia pateikti praktinių įžvalgų dėl to, kaip derėtų optimizuoti būsimą reformų politiką.

Reikšminiai žodžiai: registravimo reforma; įmonių inovacijos; neefektyvios investicijos.