

Original Paper

Capital Market Opening-up and High-Quality Innovation of Enterprises

Jiawei Qian

Harbin University of Commerce, Harbin, Heilongjiang 150028, China

Received: August 25, 2026 Accepted: September 22, 2026 Online Published: October 3, 2026

doi:10.22158/jepf.v12n3p147

URL: <http://dx.doi.org/10.22158/jepf.v12n3p147>

Abstract

At present, China's innovation field is facing the structural dilemma of quantity priority and insufficient quality. In the critical window period when the economy turns to high-quality development, the improvement of enterprise innovation level has become an important issue. Based on the quasi-natural experimental scenario of capital market opening, this paper constructs a multi-period difference-in-differences model to test the effect of capital market opening on the quality of enterprise innovation. Both theoretical deduction and empirical test show that capital market opening helps to improve the quality of enterprise innovation, and this effect is more significant in state-owned enterprises and enterprises with overseas business income. From the perspective of mechanism, on the one hand, the opening of capital market promotes the improvement of innovation quality by improving corporate governance and alleviating financing bottlenecks; on the other hand, due to the increase of stock liquidity, the quality of innovation is suppressed. Overall, the positive effect is dominant. This paper not only expands the theoretical analysis of the relationship between capital market opening and enterprise innovation, but also provides a useful reference for policy practice.

Keywords

Capital Market Opening-up, Innovation Quality, Corporate Governance, Financing Constraints, Stock Liquidity

1. Introduction

Against the strategic backdrop of Chinese-style modernization and high-quality economic development, high-quality innovation undoubtedly occupies a pivotal position. It serves not only as the core engine for China to seize the strategic high ground amid profound global changes unseen in a century and advance the great rejuvenation of the Chinese nation (Wang et al., 2023), but also as a key force driving economic transformation and upgrading and fostering a new development paradigm. The 20th National Congress

of the Communist Party of China has drawn up the strategic blueprint of “accelerating the realization of high-level self-reliance and self-improvement in science and technology”. It profoundly reveals that high-level scientific and technological self-reliance, as a systematic project to forge new engines for future growth and foster new-quality productive forces, is of extreme importance to the long-term national development (Zheng et al., 2024).

Against the backdrop of an increasingly complex international environment, especially the containment and suppression of China’s high-tech industries by some Western countries. China is at a critical stage of economic recovery in the post-pandemic era. In this context, high-quality innovation has become a key driver for China to break through development dilemmas. Over the past decade, China has ranked first worldwide in the total number of patent applications with prominent quantitative innovation advantages. However, according to the Global Innovation Index released by the World Intellectual Property Organization, China’s global innovation ranking stood at 12th. This mismatch between quantity and quality indicates that China’s innovation development is trapped in a structural dilemma that prioritizes quantity over quality. China’s economic development model has transformed from high-speed growth to high-quality development, which imposes higher requirements on corporate innovation. High-quality innovation enables firms to build core competitive advantages in innovation competition. In contrast, low-quality innovation not only places enterprises at a competitive disadvantage, but also sees its short-term value gradually eliminated in market competition, thereby weakening firms’ technological competitiveness (Wang et al., 2023). It can thus be seen that high-quality innovation outcomes are not only vital for firms to stand out in fierce market competition, but also a fundamental approach to prevent the dissipation of short-term value and the erosion of technological status resulting from low-quality innovation. Corporate innovation constitutes a critical investment strategy determining the rise and fall of enterprises (Zhu et al., 2020). In the long run, firms’ tendency to emphasize innovation quantity at the expense of innovation quality is detrimental to their high-quality innovation as well as their high-quality development.

The 2023 Central Economic Work Conference pointed out that China must rely on reform and opening-up to strengthen the endogenous driving forces for development, and coordinate the advancement of in-depth reform and high-level opening-up. The official launch of the Shanghai-Hong Kong Stock Connect in 2014 marked a milestone in the opening-up of China’s A-share capital market. Capital market opening-up can not only promote the reform of China’s financial system, but also boost socio-economic development (Lian et al., 2019). Firm innovation relies heavily on the capital market. The liquidity, development level, volatility and information environment of a country’s capital market all affect firms’ innovation willingness and R&D investment (Bravo-Biosca et al., 2016). Accordingly, capital market opening-up is bound to exert influences on corporate innovation. With respect to the impact of the capital market on firm innovation, corporate R&D-based innovation is characterized by long investment cycles, high capital outlays and substantial risks, which exposes R&D activities to considerable technological and market risks (Lv et al., 2022). Once R&D fails, firms will suffer heavy losses (Holmstrom et al.,

1989). Nevertheless, capital market opening-up brings in sophisticated foreign investors with mature investment philosophies. It helps guide domestic investors toward value-oriented investment, curb short-term speculative trading, and raise investors' tolerance for corporate innovation failure (Chen et al., 2019), thereby promoting firm innovation. Secondly, corporate agents may exhibit hedonistic opportunistic behavior (Wright et al., 1996). Meanwhile, under performance pressure stemming from investors' "voting with their feet" in the stock market, agents tend to behave myopically (Jan B. et al., 2017). Driven by these incentives, agents tend to cut investment in innovative activities characterized by high risks, long cycles and large capital requirements. Nevertheless, capital market opening-up introduces foreign investors, which strengthens external supervision over listed firms (Ferreira et al., 2008), improves corporate governance of listed companies, mitigates managers' career concerns and restrains agents' myopia (Zhu et al., 2020), and consequently optimizes firms' innovation-related decisions. Finally, existing studies on capital market opening-up and firm innovation suggest that capital market opening-up reduces firms' financing costs and increases their R&D investment (Zhu et al., 2020; Qi, 2020).

On the impact of capital market opening on innovation, the focus of the existing literature is mostly on R&D investment and the number of patents. Although these studies generally agree that capital market opening can promote enterprise innovation, the selected measurement indicators are mostly quantitative variables such as R&D funds and patent applications, and systematic investigations with innovation quality as the core are still rare. This can be extended to three questions that still need to be answered: Is the increase in R & D investment necessarily accompanied by the improvement of innovation quality? Does the promotion effect identified by the existing research correspond to quantitative expansion or quality improvement? Is capital market opening likely to induce innovation traps? In view of the above questions, this paper selects the capital market opening and the enterprise level innovation quality as the research object, and focuses on the analysis of the relationship between the two and its mechanism of action.

The marginal contribution of this paper may be reflected in the following aspects.

1. Theoretical contributions:

First, this paper provides a new perspective for the study of capital market opening and enterprise innovation. The existing literature focuses on quantitative innovation indicators such as R&D investment and patent quantity, and the discussion on innovation quality is relatively weak. Considering that the trap of emphasizing quantity and neglecting quality is more common in China's innovation practice, this paper shifts the focus from innovation scale to innovation quality, and systematically tests the effect of capital market opening on high-quality innovation, thus supplementing the theoretical basis of the relationship between capital market opening and enterprise innovation quality, and also improving the theoretical framework of capital market reform and innovation upgrading to a certain extent.

Second, this paper has made some progress in the research channel. Focusing on the three intermediary paths of corporate governance, financing constraints and stock liquidity, this paper identifies and tests the mechanism of capital market opening affecting the quality of enterprise innovation, so as to clarify

the specific transmission logic between the two.

Third, this paper promotes the theoretical framework of capital market opening and extends the boundary of enterprise innovation theory. Compared with the existing research, this paper pays more attention to the micro-mechanism of capital market opening affecting high-quality innovation of enterprises, and sorts out the specific path of capital market reform acting on enterprise innovation. This not only supplements the theoretical content of capital market opening, but also provides a more complete analysis perspective for subsequent research. This paper takes corporate governance, financing constraints and stock liquidity as mediating variables, indicating that high-quality innovation of enterprises is driven by multiple factors, and there is an interactive relationship between these factors. Therefore, the theory of enterprise innovation is supplemented, especially in how the external market environment and internal governance mechanism jointly affect the innovation behavior of enterprises, providing a new theoretical explanation.

2. Practical contributions:

First of all, this paper has reference value for enterprise strategy formulation. The research conclusion is helpful for enterprises to understand how capital market opening affects innovation activities, and then arrange innovation strategies more reasonably. Enterprises can improve their innovation ability and competitive strength by means of the optimization of internal governance structure and the utilization of capital market resources.

Second, this paper has reference significance for policy formulation and implementation. For the government, the research conclusions can provide a basis for designing capital market opening policies and improving the innovation environment of enterprises. The government can promote the benign interaction between capital market opening and enterprise innovation by improving laws and regulations, strengthening market supervision and providing innovation support.

Third, help economic transformation and upgrading. Capital market opening and high-quality innovation of enterprises are important forces to promote economic restructuring. This paper reveals the internal relationship and interaction mechanism between the two, and provides a theoretical basis and practical reference for accelerating economic transformation. Deepening the opening of capital markets and stimulating the innovation vitality of enterprises will help promote high-quality economic development.

2. Theoretical Analysis and Research Hypotheses

Existing studies have confirmed that capital market opening-up can promote corporate innovation through multiple transmission channels. Taking the Shanghai-Shenzhen-Hong Kong Stock Connect program as a quasi-natural experiment, Sun et al. (2021) systematically investigated the governance effect of capital market opening-up on firm innovation. The results show that capital market opening-up significantly improves corporate innovation input, innovation output and innovation quality, and this positive effect remains robust after a series of tests. Mechanism analysis indicates that capital market opening-up promotes innovation performance through two channels: enhancing managers' willingness

to innovate and alleviating corporate financing constraints to guarantee sufficient innovative resources. Meanwhile, as an important institutional measure to promote global economic integration, capital market opening-up exerts far-reaching and multi-dimensional governance effects and plays a vital role in improving corporate innovation quality. Specifically, capital market opening-up optimizes the corporate innovation ecosystem and facilitates high-quality innovation by improving corporate governance, alleviating financing constraints, and enhancing stock liquidity.

In terms of corporate governance, capital market opening-up optimizes corporate governance structures and improves firm governance quality. The entry of sophisticated foreign investors introduces stricter investment screening criteria. Foreign investors tend to select listed firms with larger scale, higher information disclosure transparency and sounder governance mechanisms (Leuz, 2009). Such preference incentivizes listed firms to actively improve their governance quality to meet the expectations of international investors, thereby attracting more foreign capital inflows (Ma et al., 2021). Notably, although foreign investors under the Shanghai-Hong Kong and Shenzhen-Hong Kong Stock Connect schemes are restricted from directly participating in corporate management, they can express their evaluation of corporate governance through market trading behaviors, namely “voting with their feet”. This mechanism indirectly promotes the improvement of listed firms’ information disclosure quality and overall governance level (Lian et al., 2019). In addition, capital market opening-up attracts more analyst coverage (Li et al., 2022), strengthens external supervision, optimizes corporate information environment, and further promotes the continuous improvement of corporate governance. Existing literature has documented that capital market opening-up significantly improves corporate governance by enhancing information disclosure quality, increasing analyst attention and strengthening external supervision (Feng et al., 2008). As the cornerstone of internal management, improved corporate governance exerts a profound influence on firm innovation. It effectively alleviates governance problems caused by information asymmetry and agency conflicts, encourages managers to focus on long-term corporate development, and mitigates managerial myopia (Qi et al., 2023). Such long-term shift in managerial vision further optimizes the structure of corporate innovation investment, enables innovative resources to be more efficiently allocated to long-term valuable R&D projects, and ultimately enhances firms’ technological innovation capability and market competitiveness. Based on the above theoretical analysis and literature review, this paper proposes the first research hypothesis.

H1: Capital market opening-up significantly improves firms’ innovation quality by enhancing corporate governance.

In terms of financing constraints, capital market opening-up plays a crucial role in corporate innovation activities. Specifically, capital market opening-up facilitates the free flow of cross-border portfolio capital and significantly alleviates corporate financing difficulties through multiple channels. Firstly, it improves the information efficiency of stock prices, reduces information asymmetry among market participants, and thereby lowers firms’ debt financing costs (Tang et al., 2020). This mechanism not only improves the resource allocation efficiency of the capital market, but also provides a more solid financial

foundation for firms to conduct long-term innovation activities. Secondly, capital market opening-up reduces firms' equity financing costs through the dual effects of competition channels and information channels (Pang et al., 2020). The entry of foreign investors and intensified market competition compel listed firms to improve the quality and timeliness of information disclosure, which attracts broader market attention and effectively reduces corporate financing costs. Li (2023) further demonstrates that capital market opening-up significantly mitigates corporate financing constraints through multiple channels, including enhancing firm information transparency, expanding analyst coverage, correcting stock mispricing, and increasing the proportion of equity financing. Such constraint-mitigating effect is particularly essential for corporate innovation. Characterized by high uncertainty, long investment cycles and substantial capital intensity, innovation activities exacerbate information asymmetry and induce moral hazard, thereby raising external financing frictions and financing premiums for innovative projects (Ju et al., 2013). The alleviation of financing constraints broadens firms' capital sources and replenishes internal capital reserves, enabling enterprises to freely invest in high-risk, long-cycle, and capital-intensive R&D projects, which is particularly vital for firms' breakthrough innovation (Xu et al., 2020). From the perspective of the resource-based view, the heterogeneous resources characterized by scarcity, inimitability, and non-substitutability serve as the fundamental source of firms' sustainable competitive advantages and enable enterprises to obtain economic rents (Barney J., 2011). As an important part of enterprise innovation activities, the increase of R & D investment can not only attract high-quality talents to participate in innovation practice, promote technology accumulation and knowledge precipitation, but also lead capital to the frontier research field of the industry, thus forming high-quality innovation output. Such innovative achievements often have the characteristics of scarcity, difficult to imitate and irreplaceable, which constitute the unique competitive advantage of enterprises and make them occupy a favorable position in the fierce market competition. It can be seen that increasing R & D investment not only provides direct resources for current innovation activities, but also a strategic layout for future high-quality innovation results. This investment promotes high-quality innovation of enterprises and further consolidates their long-term competitiveness and market position. In summary, the opening of the capital market will help ease the financing constraints of enterprises, provide them with more sufficient financial support, promote the expansion of R&D investment, and then promote the development of high-quality innovation activities, laying the foundation for the sustainable development of enterprises. Accordingly, this paper puts forward the second research hypothesis.

H2: The opening of capital market promotes the improvement of enterprise innovation quality by alleviating financing constraints.

In terms of stock liquidity, the Shanghai-Shenzhen-Hong Kong Stock Connect target companies are deeply affected by the opening of the capital market. Specifically, with the expansion of market boundaries, analysts have paid significantly greater attention to these firms. Analysts' in-depth analysis and value judgment of the company can convey richer and more specific company-specific information to the market. As a result, the information asymmetry between the target company and the market is

reduced, and its stock liquidity is also increased (Li et al., 2022). However, how does stock liquidity affect the quality of enterprise innovation. There is no conclusion in the academic circle. Several viewpoints are competing with each other. Some scholars are cautious, believing that high stock liquidity will inhibit corporate innovation. The reason is that high liquidity depresses the transaction costs of short-term investors, who pay more attention to short-term returns and have limited interest in the long-term development of the company. This myopic tendency may force managers to cut long-term R&D expenditures to meet the market's short-term performance expectations, and thus inhibit corporate innovation activities (Fang, V. et al., 2014).

In addition, high stock liquidity may also increase the risk of hostile takeovers. Faced with the threat of being acquired, managers may sacrifice long-term interests in exchange for short-term performance, and innovation is further frustrated. Empirical evidence also shows that companies with anti-takeover provisions tend to have a higher level of innovation, which provides indirect support for the above view. On the other hand, some scholars hold a positive attitude that high stock liquidity can promote enterprise innovation. In their view, high stock liquidity first supports innovation activities by easing corporate financing constraints. Since more liquid stocks are more attractive to investors, they can provide necessary financial support for corporate innovation (Amihud, Y. et al., 2002). Secondly, high stock liquidity facilitates the entry of external shareholders, accompanied by increased shareholdings of institutional investors and large shareholders. Such shareholders usually possess stronger monitoring capacity and a longer-term horizon, which helps improve corporate governance structures and thereby promote corporate innovation (Maug, E. et al., 1998). Finally, high stock liquidity may also stimulate inter-firm mergers and acquisitions, and further advance resource integration and technological innovation (Tong et al., 2020). In addition, some scholars propose a more complicated influencing path of stock liquidity on corporate innovation. That is, high stock liquidity may encourage firms to engage in strategic innovation, which is reflected in an increase in the quantity of patents accompanied by a decline in innovation quality (Lin et al., 2021). This view reveals the double-edged-sword effect of stock liquidity in the process of influencing corporate innovation.

Synthesizing the above-mentioned literature, this paper argues that stock liquidity exerts multi-dimensional influences on firms' innovation quality. Although improved stock liquidity generates a positive promoting effect on innovation quality through indirect channels such as enhancing corporate governance and alleviating financing constraints, its direct effect may turn out to be inhibitory. Especially in the short run, high stock liquidity tends to intensify managerial myopia. Therefore, under the background of capital market opening-up, although capital market opening-up generally plays a positive role in firms' innovation quality, the improvement of stock liquidity needs to be carefully managed to avoid its potential negative impacts on corporate innovation quality. Therefore, under the background of capital market opening-up, although capital market opening-up generally plays a positive role in firms' innovation quality, the improvement of stock liquidity needs to be carefully managed to avoid its potential negative impacts on corporate innovation quality.

H3: Capital market opening-up increases stock liquidity, which in turn inhibits firms' innovation quality.

3. Research Design

3.1 Sample Selection and Data Sources

This study selects Chinese A-share listed firms on the Shanghai and Shenzhen Stock Exchanges from 2010 to 2022 as the research sample. The financial data of the enterprise are taken from the CSMAR database, and the innovation quality data are from the State Intellectual Property Office and the National Bureau of Statistics. When data cleaning, financial, real estate, ST and * ST companies are excluded. The final sample contains annual observations from 24,168 companies. Continuous variables are Winsorized at the 1 % level to reduce extreme value interference. Missing values are filled by interpolation. Variables such as enterprise size are logarithmically processed to eliminate dimensional differences and enhance data stability.

3.2 Model Specification and Variable Definitions

This paper employs the following two-way fixed effects difference-in-differences model to examine the impact of capital market opening on corporate innovation quality:

$$pk_{i,t} = \alpha + \mu_i + \lambda_t + \theta D_{i,t} + \beta controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

(1) Dependent variable: Firm innovation quality (InnQ)

The dependent variable in this study is firm innovation quality. Following Zhang et al. (2018), the **patent knowledge-width method** is employed to measure innovation quality at the firm level. The specific formula is: $pk_{i,t} = 1 - \sum \alpha^2$, where α denotes the proportion of each major group within the IPC patent classification number. The pk value is first calculated for each individual patent, and then aggregated to the firm level along three dimensions: firm, year, and patent type. The resulting dependent variable is denoted as InnQ.

(2) Key explanatory variable: Stock Connect trading regime (Open)

$D_{i,t}$ denotes the policy interaction term for the staggered DID model, where $D_{i,t} = treat * post$. Specifically, treat is a firm-level dummy variable that equals 1 when a listed firm is included in the Stock Connect target list, and 0 otherwise. post is a time dummy variable taking the value of 1 for observations in and after the year when the firm is added to the Stock Connect list, and 0 otherwise.

(3) Corporate Governance (CGI)

Following Ma et al. (2021), this paper selects governance indicators from three dimensions: shareholders, board of directors, and executive incentive. The indicators include firm ownership type, executive compensation, executive shareholding ratio, board size, institutional shareholding ratio, equity restriction degree, CEO-chairman duality, and shareholding ratio of the largest shareholder. A principal component analysis is performed to construct the corporate-governance composite index CGI. The first principal component is retained as the comprehensive proxy for corporate governance. A higher value of CGI indicates better corporate-governance quality.

(4) Financing Constraints (SA)

Following Ju et al. (2013), this paper computes the SA index to measure firms' financing constraints. The specific formula is:

$$SA = -0.737 * Size + 0.043 * Size^2 - 0.040 * Age \quad (2)$$

(5) Stock Liquidity (Liq)

Following Amihud Y. (2022), Ami is the annual average of the ratio of the absolute value of individual stock returns to daily trading amount. A larger value of Ami indicates that the trading amount of individual stocks exerts a greater impact on individual stock returns, which means poorer stock liquidity. This study constructs a stock-liquidity indicator; a higher value of this indicator denotes better stock liquidity. The specific formula is:

$$Liq = -\ln(1 + Ami) \quad (3)$$

(6) Control Variables

Following Zhang and Zheng (2018), a set of control variables is included to account for other factors affecting corporate innovation quality: ROA, MF, Lev, Ind, SIZE, CF, Top1, Top10, Ppe, PB, Growth, and Tobin's Q. The definitions and calculations of all variables are summarized in Table 1.

Table 1. Variable Definitions

Variable Type	Variable Name	Symbol	Definition
Dependent Variable	Innovation Quality	PK	Innovation quality measured by knowledge width approach
Dependent Variable	Innovation Quality	PKT	$-0.737 * Size + 0.043 * Size^2 - 0.040 * Age$
Independent Variable	Capital Market Opening	DID	Treat $\times$ Post
Mediating Variable	Financing Constraints	SA	SA index following Ju et al. (2013)
Mediating Variable	Corporate Governance	CGI	First principal component of nine governance indicators
Mediating Variable	Stock Liquidity	Liq	Amihud illiquidity measure (inverted)
Control Variable	Firm Size	SIZE	Natural logarithm of total assets
Control Variable	Leverage	LEV	Total liabilities / total assets
Control Variable	Fixed Asset Ratio	Ppe	Fixed assets / total assets $\times$ 100%
Control Variable	ROA	ROA	Total profit / total assets
Control Variable	Management Expense Ratio	MF	Management expenses / operating revenue
Control Variable	Executive Shareholding	Ms	Executive shares / total shares
Control Variable	Independent Director Ratio	Ind	Independent directors / board size
Control Variable	Largest Shareholder	Top1	Largest shareholder shares / total market value

Control Variable	Top Ten Shareholders	Top10	Top ten shareholders / total market value
Control Variable	Price-to-Book Ratio	PB	Market price / book value per share
Control Variable	Growth	Growth	Operating revenue growth / prior year revenue $\times 100\%$
Control Variable	Tobin's Q	Q	Market value / replacement cost of assets
Heterogeneity Variable	SOE	SOE	=1 if state-owned, 0 otherwise
Heterogeneity Variable	Overseas Revenue	OPEN	=1 if has overseas revenue, 0 otherwise

4. Empirical Tests

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics. The mean of the dependent variable PK is 0.3833 with a standard deviation of 0.3024, which is comparable to findings in existing studies and within a reasonable range. The three mediating variables—financing constraints (SA), corporate governance (CGI), and stock liquidity (liq)—also have values consistent with prior research and within reasonable ranges, providing a solid foundation for subsequent empirical analysis.

Table 2. Descriptive Statistics

Variable	N	Mean	Std. Dev.	Median	Min	Max
PK	24,168	0.3833	0.3024	0.3786	0.0000	0.9435
SA	24,168	3.9991	1.5432	5.1067	1.5620	9.3442
CGI	24,121	0.0631	0.6424	-0.4196	-1.2584	2.0822
liq	24,163	-0.0892	0.2825	-0.0177	-2.2089	0.1136
ROA	24,167	0.0480	0.0624	0.0324	-0.1918	0.3068
MF	24,168	0.0858	0.0606	0.0552	0.0094	0.3515
Lev	24,168	0.4037	0.1968	1.2884	0.0529	0.8704
Ind	24,168	0.3756	0.0532	0.3333	0.3333	0.5714
SIZE	24,168	22.2386	1.2794	23.4382	20.1033	26.2723
CF	24,168	0.0490	0.0642	0.0342	-0.1298	0.2341
Top1	24,168	0.3354	0.1465	0.2991	0.0826	0.7349
Top10	24,168	0.5889	0.1533	0.5292	0.2337	0.9104
Ppe	24,168	0.2067	0.1424	0.1430	0.0074	0.6533
PB	24,158	3.5551	2.7412	1.9508	-3.1265	27.9515
Growth	24,168	0.2752	0.5952	1.9508	-0.6097	3.5655
Q	24,158	2.0124	1.1935	1.3089	-7.4915	14.4558

4.2 Baseline Regression Results

Table 3 reports the baseline regression results of estimating Equation (1). As shown, the coefficient on DID remains significantly positive at the 5% level after including a set of control variables and controlling for firm and year fixed effects. This indicates that capital market opening promotes corporate innovation quality.

Table 3. Baseline Regression Results

Variable	(1) PK	(2) PK	(3) PK
DID	0.1164*** (0.0048)	0.0743*** (0.0057)	0.0154** (0.0070)
Controls	No	Yes	Yes
Year FE	No	No	Yes
Firm FE	No	No	Yes
Constant	0.3709*** (0.0032)	0.2689*** (0.0657)	0.4070*** (0.1389)
N	24,168	24,157	24,157
R ²	0.0481	0.1342	0.3299

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses.

4.3 Robustness Tests

1. Parallel Trend Test

Since firms enter the Shanghai-Hong Kong and Shenzhen-Hong Kong Stock Connect programs at different times, there are multiple control groups, and the parallel trend assumption cannot be tested directly by comparing the mean changes of the treatment and control groups. Following the event study approach, the following model is specified:

$$pk_{i,t} = \alpha + \mu_i + \lambda_t + \sum_{\tau=1}^3 \theta_{-\tau} D_{i,t} + \theta D_{i,t} + \sum_{\tau=1}^6 \theta_{+\tau} D_{i,t+\tau} + \beta controls_{i,t} + \varepsilon_{i,t} \quad (4)$$

In this paper, the investigation window is set as 3 years before the event and 5 years after the event. The estimated results show that the coefficients of t-3 to t+2 are not significant, t+3 is positive at the 5% level, and t+5 is significantly positive at the 1% level. Parallel trend test passed.

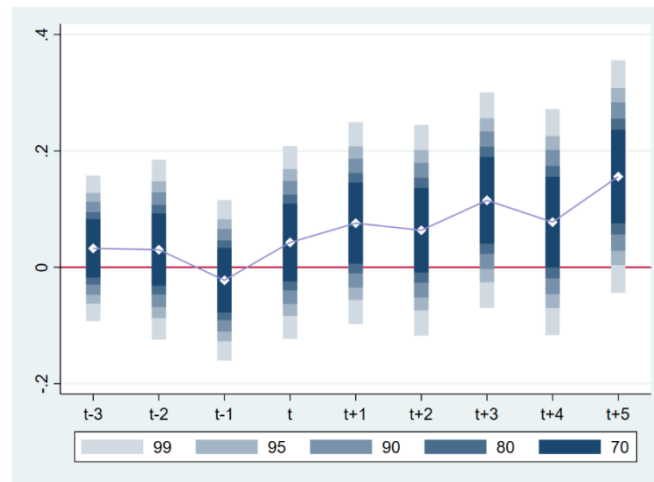


Figure 1. Parallel Trend Test Results

2. Bootstrap Re-sampling

In this paper, 500 Bootstrap re-samplings of the model are made and re-estimated. Table 4 shows that the opening of capital market has significantly improved the quality of enterprise innovation, and the benchmark regression conclusion is still robust.

Table 4. Bootstrap Re-sampling Results

Variable	PK
DID	0.0163*** (0.0059)
Controls	Yes
Year FE	Yes
Firm FE	Yes
Constant	0.3281*** (0.0201)
N	24,167
R ²	0.3296

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3. Alternative Measure of Dependent Variable

Change the dependent variable to re-test the robustness. Referring to the practice of Zheng et al. (2024), the measurement of innovation quality is changed from knowledge width to forward patent citation number (PKT). After the PK in the benchmark model is replaced by PKT, the DID coefficient in Table 5 is still significantly positive at the 1% level, and the conclusion that capital market opening improves the quality of enterprise innovation is again supported.

Table 5. Alternative Dependent Variable Results

Variable	PKT
DID	0.1181*** (0.0337)
Controls	Yes
Year FE	Yes
Firm FE	Yes
Constant	1.7912*** (0.1223)
N	23,279
R ²	0.6183

Notes: *** p<0.01, ** p<0.05, * p<0.1.

4. Time Expectation Effect Test

In the benchmark model, the lagged dummy variable (post2, 1 in the previous year) and the interaction term of Treat (DID2) were added to do the placebo-like test. Table 6 shows that after controlling the time expectation effect, the significance is roughly the same as the benchmark regression, and the benchmark results are still robust.

Table 6. Time Expectation Effect Test

Variable	PK
DID2	0.0256*** (0.0068)
Constant	0.4393*** (0.1371)
Controls	Yes
Year FE	Yes
Firm FE	Yes
N	24,157
R ²	0.3303

Notes: *** p<0.01, ** p<0.05, * p<0.1.

5. Placebo Test

Although this paper has used control variables to include other factors that affect the quality of innovation, it may still sometimes change confounding factors to interfere with the estimation. For this purpose, a placebo test was performed: the sham treatment group was randomly assigned from the sample enterprise,

and the simulation regression was repeated 500 times. Figure 2 shows that the pseudo-regression coefficients are concentrated near zero and far less than the true coefficients in the benchmark regression, and the benchmark results are still robust.

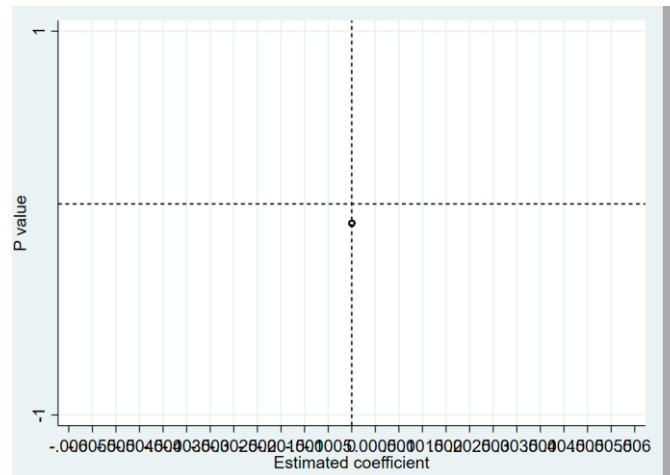


Figure 2. Placebo Test Results

6. Heterogeneity Analysis

To examine the differentiated impact of capital market opening on different enterprises, it is necessary to first look at the heterogeneity of enterprises themselves, which is the basis for them to respond to external changes in globalization. This paper selects two dimensions: the nature of property rights and whether they have overseas income, and analyzes how they shape the innovation response of enterprises under the opening of capital market.

The driving effect of capital market opening on innovation is not small among different enterprises. Whether an enterprise can catch the open dividend and adjust its innovation behavior depends largely on its own characteristics. This paper selects the two micro-dimensions of property rights and overseas income sources to examine the differences in innovation response of heterogeneous enterprises under the opening of capital markets.

From the perspective of the nature of property rights, state-owned enterprises and non-state-owned enterprises are different in resource endowments, policy support, and market positioning, and the ability to attract foreign investment and capital allocation efficiency also widen the gap. State-owned enterprises have government credit, high-quality resource reserves and stable operating expectations, which are more attractive to overseas investors and often become the preferred target for foreign capital in the opening of capital markets. As an important carrier of national strategy and industrial security, state-owned enterprises have higher market recognition and stronger anti-risk ability. They can broaden financing channels, ease R&D financing constraints, reduce long-term financing costs, and provide financial and resource support for continuous R&D and innovation quality improvement.

Non-state-owned enterprises can also be exposed to the light of capital market opening, but the

advantages are not great. Due to fierce market competition, insufficient credit endorsement, and many external financing frictions, the efficiency of introducing and utilizing foreign capital is naturally low. In terms of innovation quality, the pull of opening up to non-state-owned enterprises is weaker, and the time lag is more obvious.

In terms of the nature of property rights, there are many differences between state-owned enterprises and non-state-owned enterprises in terms of resource base, policy support and market positioning, and the attraction and utilization efficiency of foreign capital are also different. State-owned enterprises are backed by the government, have a wide network of resources, and are more advantageous in the opening of the capital market. They are often the first choice for foreign investment. This is because of both the advantages of policy orientation and the fact that state-owned enterprises are regarded as an important pillar of national economic security and strategic development, which makes it easier to gain the trust of capital markets. Therefore, state-owned enterprises can seize the opportunity of capital market opening, broaden financing channels, lower financing costs, add fire to innovation, and the quality of innovation will be faster. Non-state-owned enterprises also benefit, but the competition is more intense, financing is more difficult, the effect on the quality of innovation will take a while to see.

Second, whether the enterprise has overseas income is also a key factor in dealing with the opening of the capital market. With overseas income, it not only shows that the internationalization strategy has achieved results, but also means that there is an additional channel to obtain global innovation resources, technology transfer and knowledge spillover. Through in-depth interaction with the international market, such enterprises can grasp the forefront of the industry in a timely manner, the introduction of advanced technology and management methods, so as to accelerate their own technological innovation and industrial upgrading. The overseas market has opened up, and the space for resource integration is also greater, such as attracting and retaining international top talents, and obtaining R&D support for key technologies, which have laid the foundation for improving the quality of innovation. Therefore, in the context of capital market opening, enterprises with overseas income are more likely to rely on resource integration and optimal allocation to achieve a leap in innovation capabilities, and the pull of innovation quality is more obvious than that of enterprises without overseas income.

Existing research provides the theoretical foundation for the heterogeneity analysis. Following the property rights nature, a dummy variable SOE is set equal to 1 if the firm is state-owned, and 0 otherwise. Meanwhile, a dummy variable OPEN is set equal to 1 if the firm has overseas revenue, and 0 otherwise. To ensure sample comparability, following Zhang et al. (2023), this paper constructs a difference-in-difference-in-differences (DDD) model by adding the triple interaction terms $DID \times OPEN$ and $DID \times SOE$ (denoted as $DIDOPEN$ and $DIDSOE$) to the baseline model. These two variables are separately entered into the baseline model as dependent variables. The regression results in Table 7 show that the coefficient on $DID \times OPEN$ is significantly positive at the 10% level, with a coefficient of 0.0193 (vs. 0.0154 in the baseline), indicating that the effect of capital market opening on innovation quality is more pronounced among firms with international revenue. The coefficient on $DID \times SOE$ is significantly positive at the 1%

level, with a coefficient of 0.0329 (vs. 0.0154 in the baseline), indicating that the effect is more pronounced among state-owned enterprises.

Table 7. Heterogeneity Analysis Results

Variable	Overseas Revenue	SOE
DIDOPEN	0.0193* (0.0108)	
DIDSOE		0.0329*** (0.0108)
DID	0.0014 (0.0101)	0.0014 (0.0080)
Controls	Yes	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Constant	0.2909*** (0.0080)	0.2923*** (0.0080)
N	24,168	24,168
R ²	0.3289	0.3291

Notes: *** p<0.01, ** p<0.05, * p<0.1.

7. Mechanism Tests

The preceding sections show that capital-market opening improves corporate innovation quality based on theoretical analysis and empirical tests, and this conclusion is robust after a set of robustness checks. This section further explores the underlying mechanisms from three channels: corporate governance, financing constraints, and stock liquidity.

For mechanism analysis, this paper applies the mediation-effect test. The test proceeds in three steps. First, confirm the causal relation between the core independent and dependent variables. Second, verify significant effects of mediating variables on the dependent variable. Third, estimate the association between mediating variables and the core independent variable. Since the theoretical links between the three mediators and the outcome variable have already been elaborated earlier, they are not restated. This subsection adopts a two-way fixed-effects DID model: each mediating variable is taken as the dependent variable, while DID (the interaction term of Treat and Post) serves as the key independent variable.

7.1 Mechanism 1: Corporate Governance

For the corporate-governance mechanism analysis, drawing on the analytical framework proposed by Bai et al. (2005), this paper selects nine detailed indicators covering ownership structure, board characteristics, and management incentive, including property-right nature, executive compensation,

managerial shareholding, board size, institutional investors' shareholding ratio, equity restriction degree, CEO-chairman duality, and the shareholding concentration of the largest shareholder. These indicators are used to depict multi-dimensional corporate-governance features of listed firms. Subsequently, principal component analysis (PCA) is adopted to reduce the dimensionality of the nine indicators and construct a comprehensive corporate-governance index (CGI).

The CGI score measures the quality of corporate governance. The higher the score, the better the governance performance. The regression results show that CGI is significantly positively correlated with capital market openness at the 99% confidence level, indicating that capital market openness does improve corporate governance. Openness not only broadens the financing channels of enterprises, but also promotes the optimization of governance structure and efficiency by improving the transparency of information disclosure, attracting analysts' attention, and strengthening external supervision. According to the existing literature, governance improvement can alleviate agency conflicts and is also an important driving force for enterprise innovation (Feng et al., 2008). As soon as the level of corporate governance is improved, the short-sighted behavior of managers is inhibited (Qi et al., 2023). They are more willing to focus on the long-term development of enterprises, optimize the allocation of innovation investment, and improve the performance of technological innovation. This shows that the opening of capital market can indirectly promote the improvement of enterprise innovation quality through the intermediary channel of corporate governance.

7.2 Mechanism 2: Financing Constraints

Referring to the practice of Ju et al. (2013), this paper uses the enterprise-level SA index to measure financing constraints, and the algorithm is the same as above. The two-way fixed effect DID model is used to identify the causal relationship between capital market opening and financing constraints. In the regression results, the DID coefficient is significantly positive, indicating that the opening of the capital market has broadened the financing channels and lowered the financing costs. As a result, the financing difficulties of enterprises have been alleviated, and innovation has more sufficient financial support.

From the perspective of the resource-based view (RBV), heterogeneous resources that are scarce, inimitable, and irreplaceable constitute the core source of corporate competitive advantages and economic rents. Increased R&D investment helps firms gather high-quality innovative talents and focus on cutting-edge technological breakthroughs, laying a solid foundation for high-quality innovation output (Chen et al., 2020). High-quality innovation achievements represent crucial heterogeneous resources (Barney, 1991). Their characteristics of scarcity, high value, and inimitability enable firms to maintain sustainable competitive advantages. Accordingly, firms are motivated to undertake high-risk, long-cycle, and high-input innovation activities, which ultimately improve corporate innovation quality and market competitiveness.

Resource-based view (RBV) believes that scarce, difficult to imitate, irreplaceable heterogeneous resources are the fundamental source of competitive advantage and economic rent. With the increase of R&D investment, it is easier for enterprises to gather high-quality innovative talents and focus on cutting-

edge technologies, and high-quality innovation output will have a foundation (Chen et al., 2020). his high-quality innovation achievement itself is a key heterogeneous resource (Barney, 1991). It is scarce, valuable, and unlearned by others. Enterprises can stabilize their competitive advantages by relying on it. Because of this, enterprises are willing to do high-risk, long-cycle, high-input innovation activities, and innovation quality and market competitiveness eventually follow.

7.3 Mechanism 3: Stock Liquidity

This paper constructs the illiquidity index (Ami) according to the Amihud method, which is measured by the annual average ratio of the absolute daily return rate of the stock to the absolute daily trading volume. The higher the Ami, the greater the impact of trading volume on price, and the worse the stock liquidity. In order to facilitate the explanation, this paper also sets the reverse index liq, the larger the liq, the better the liquidity.

The estimation results of the two-way fixed effect DID model show that the DID coefficient is significantly positive at the 1% level, indicating that the opening of the capital market has indeed improved stock liquidity. Consistent with the theoretical analysis, increased liquidity has inhibited the quality of enterprise innovation. That is to say, the opening of capital market has a negative impact on the quality of innovation by pushing up stock liquidity.

Table 8. Mechanism Test Results

Variable	CGI	SA	liq
DID	0.0496*** (0.0114)	0.0397*** (0.0027)	0.0396*** (0.0085)
Constant	2.3581*** (0.2304)	-22.5668*** (0.0940)	-1.2728*** (0.1395)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
N	24,116	24,157	24,157
R ²	0.3536	0.9950	0.2137

Notes: *** p<0.01, ** p<0.05, * p<0.1.

5. Conclusions and Policy Implications

5.1 Main Conclusions

This paper systematically investigates the impact and mechanism of capital market opening on corporate innovation quality, taking corporate governance, financing constraints, and stock liquidity as mediating variables. The main conclusions are as follows:

1. Capital market opening significantly improves firms' innovation quality. By introducing foreign capital and expanding external financing channels, capital market opening provides strong financial support for high-quality innovation. Different from existing studies that mainly focus on innovation input and output, this paper verifies that capital market opening also effectively promotes innovation quality, and the result remains robust after a series of tests. Heterogeneity analysis shows that this promotional effect is more pronounced for state-owned enterprises and firms with overseas businesses.
2. The intermediary role of financing constraints is significant. Financing constraints are a key obstacle to enterprise innovation, and capital market opening can effectively alleviate this problem. Specifically, the opening of the capital market has increased the proportion of equity financing, reduced financing costs, and provided sufficient funding for high-quality corporate innovation.
3. When stock liquidity is high, high-quality innovation of enterprises is affected. The opening of the capital market has opened more mouths to domestic and foreign investors, more active transactions, more participants, liquidity, operational efficiency and transaction transparency. High liquidity itself indicates that the market is dynamic and mature, but this paper finds that excessive liquidity will drag down long-term high-quality innovation of enterprises. First, high liquidity makes it easy for investors to focus on short-term returns, ignoring the long-term R&D layout and innovation investment of enterprises. Second, market volatility has been amplified, financing costs have followed, and innovation power has been whittled down. Further analysis of moderating effects shows that the alleviation of financing constraints and the improvement of corporate governance can effectively hedge this negative impact. Optimized financing environments and reduced financing costs can provide sufficient financial support for corporate innovation activities, while improved corporate governance structures restrain managers' short-term profit-seeking behaviors and urge them to balance short-term operating benefits and long-term innovative development of enterprises.
4. Corporate governance improvement acts as a long-term driving force for high-quality innovation. Capital market opening introduces foreign investors with higher governance requirements. These investors exert external supervisory effects to constrain managerial opportunistic behaviors and optimize corporate governance mechanisms. A sound corporate governance structure encourages managers to actively carry out innovative activities and ultimately improves firms' long-term value.

5.2 Policy Implications

Based on the above conclusions, this paper proposes the following policy recommendations to better promote the coordinated development of capital market opening and high-quality corporate innovation:

1. Deepen capital market opening. The government should unwaveringly advance capital market opening, develop opening models consistent with the trends of the times, and promote deep integration of the two markets. Meanwhile, cross-border capital flows should be closely monitored to prevent the impact of large-scale short-term capital inflows and outflows on firms' capital needs.
2. Optimize the financing environment. Strengthen financial infrastructure development and improve the financing efficiency of the capital market. The mechanisms of credit rating and guarantee enhancement

can be further strengthened to lower the financing threshold and cost of enterprises. Financial institutions should also innovate more products and provide more suitable financing tools for technology-based enterprises.

3. Enhance corporate governance. Strengthen the formulation and enforcement of laws and regulations related to corporate governance, and guide firms to establish sound governance structures. In particular, the supervisory role of foreign investors should be leveraged by introducing more investors with international vision and governance experience to improve the overall governance level of Chinese enterprises, ensuring that management attends to both short-term returns and long-term development and innovation capabilities.

4. Corporate governance also has to catch. Relevant laws and regulations should be well established and implemented in place to guide enterprises to complete the governance structure. The supervisory role of foreign investors should be used in particular, and more investors with international vision and governance experience should be introduced to bring up the overall governance level of domestic enterprises, so that management can see both short-term returns and long-term innovation capabilities.

5. Supervision and risk prevention also have to keep up. In the process of capital market opening, risk prevention and supervision cannot be relaxed. It is necessary to establish a sound risk early warning and response mechanism to detect and deal with potential risks in a timely manner. At the same time, strengthen the monitoring and management of cross-border capital flows to prevent external risks from impacting China's capital market.

6. Stock liquidity also has to have a degree. In the process of opening up, the government should keep an eye on liquidity changes and do not let it rise too much. You can adjust the trading rules, add some transaction costs, put a pressure on speculation, so that investors see more of the company's long-term value. Capital market opening is closely related to high-quality innovation of enterprises. We should deepen the opening up, complete the multi-level capital market system, adjust the financing environment, improve corporate governance, keep up with investor education, and strengthen supervision and risk prevention. Only by promoting these things together can capital market opening and high-quality innovation of enterprises be coordinated.

References

- Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, 5(1), 31-56. [https://doi.org/10.1016/S1386-4181\(01\)00024-6](https://doi.org/10.1016/S1386-4181(01)00024-6)
- Bai, C. E., Liu, Q., Lu, Z., Song, M., & Zhang, J. X. (2005). An empirical study on the governance structure of Chinese listed companies. *Economic Research Journal*, 2.
- Barney, J. B., Ketchen, D. J., & Wright, M. (2011). The future of resource-based theory: Revitalization or decline. *Journal of Management*, 37(5), 1299-1315. <https://doi.org/10.1177/0149206310391805>
- Bravo-Biosca, A., Criscuolo, C., & Menon, C. (2016). What drives the dynamics of business growth?. *Economic Policy*, 31(88), 703-742. <https://doi.org/10.1093/epolic/eiw013>

- Chen, Y. S., Huang, J. Q., & Han, H. Y. (2019). Does stock market opening-up increase cash dividend levels? A quasi-natural experiment based on the Shanghai-Hong Kong Stock Connect. *Accounting Research*, 3, 55-62.
- Chen, Z. G., Li, G. W., Liang, T., & Wang, Q. W. (2020). R&D investment, intellectual property protection and enterprise innovation quality. *Science & Technology Progress and Policy*, 10.
- Fang, V. W., Tian, X., & Tice, S. (2014). Does stock liquidity enhance or impede firm innovation?. *The Journal of Finance*, 69(5), 2085-2125. <https://doi.org/10.1111/jofi.12187>
- Feng, G. F., & Wen, J. (2008). An empirical analysis of the relationship between corporate governance and technological innovation of listed companies in China. *China Industrial Economics*, 7, 91-101.
- Ferreira, M. A., & Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, 88(3), 499-533. <https://doi.org/10.1016/j.jfineco.2007.07.003>
- Holmstrom, B. (1989). Agency costs and innovation. *Journal of Economic Behavior & Organization*, 12(3), 305-327. [https://doi.org/10.1016/0167-2681\(89\)90025-5](https://doi.org/10.1016/0167-2681(89)90025-5)
- Jan, B., Ferreira, M. A., Pedro, M., & Pires, P. (2017). Are foreign investors locusts? The long-term effects of foreign institutional ownership. *Journal of Financial Economics*, 126(1), 122-146. <https://doi.org/10.1016/j.jfineco.2017.07.005>
- Ju, X. S., Lu, D., & Yu, Y. H. (2013). Financing constraints, working capital management and the sustainability of enterprise innovation. *Economic Research Journal*, 1.
- Leuz, C., Lins, K. V., & Warnock, F. E. (2009). Do foreigners invest less in poorly governed firms?. *Review of Financial Studies*, 22, 3245-3285. <https://doi.org/10.1093/rfs/hhn089>
- Li, Q. Y., & Chen, T. (2022). Capital market opening-up, analyst attention and stock liquidity: Quasi-natural experiment based on Shanghai-Shenzhen-Hong Kong Stock Connect mechanism. *Finance & Economy*, 12, 77-87.
- Li, Q. Y., & Chen, T. (2022). Capital market opening-up, analyst attention and stock liquidity. *Finance & Economy*, 12.
- Li, Q. Y., He, Y. Y., Liu, X. Q., & Ma, T. P. (2023). Research on the influence mechanism of capital market opening-up on corporate financing constraints: Evidence from Shanghai-Shenzhen-Hong Kong Stock Connect. *World Economy Studies*, 4.
- Lian, L. S., Zhu, S., & Chen, C. (2019). Capital market opening-up and the guiding effect of stock price on corporate investment: Evidence from the Shanghai-Hong Kong Stock Connect program. *China Industrial Economics*, 3, 100-118.
- Lin, Z. F., Du, J. M., & Long, X. X. (2021). Stock liquidity and Chinese enterprises' innovation strategy: Stagnant water breeds no fish or a flood wrecks havoc?. *Journal of Financial Research*, 3, 188-206.
- Lü, X. J., Hu, H. X., & Wang, H. J. (2022). Capital market opening-up and enterprise innovation quality: From the perspective of China's enterprise "innovation trap" of emphasizing quantity over quality. *Journal of Systems Management*, 31(5), 1018-1027.

- Ma, Y. M., Ma, J. Y., & Hu, C. Y. (2021). Can capital market opening-up improve the governance quality of listed companies? An empirical test based on the progressive double difference model of Shanghai-Hong Kong Stock Connect. *Journal of Guangdong University of Finance & Economics*, 4.
- Maug, E. (1998). Large shareholders as monitors: Is there a trade-off between liquidity and control?. *The Journal of Finance*, 53(1), 65-98. <https://doi.org/10.1111/0022-1082.35053>
- Pang, J. R., Zhang, H., & Zhang, M. J. (2020). Capital market opening-up and equity capital cost: Empirical research based on Shanghai-Hong Kong and Shenzhen-Hong Kong Stock Connect. *Journal of Financial Research*, 12, 169-188.
- Qi, D. (2020). Research on the Shanghai-Shenzhen-Hong Kong Stock Connect mechanism and enterprise innovation: Empirical evidence based on multi-period DID. *Contemporary Finance & Economics*, 2, 76-88.
- Qi, Y. D., Zhang, Q. L., & Yu, X. Y. (2023). The mechanism and path of executives' overseas experience promoting technological innovation. *Economic Perspectives*, 2, 52-70.
- Sun, Z. Y., & Sun, F. (2021). Capital market opening-up and corporate financialization: A quasi-natural experiment based on the Shanghai-Shenzhen-Hong Kong Stock Connect. *Management Science*, 34(6), 15-28.
- Tang, Y. Z., Wang, J. W., & Wang, S. J. (2020). Capital market opening-up and corporate bond financing cost: Evidence from Shanghai-Shenzhen-Hong Kong Stock Connect. *Securities Market Herald*, 7, 52-60.
- Tong, Y., Wang, X., Zeng, Y., et al. (2020). M&A motivation, financing decision and innovation output of acquirers. *Accounting Research*, 5, 104-116.
- Wang, X. Y., & Qin, J. Y. (2024). Innovative competition and high-quality innovation model selection of enterprises: Empirical evidence from patent invalidation. 2024:1-19.
- Wright, P., Ferris, S. P., Sarin, A., & Awasthi, V. (1996). Impact of corporate insider, blockholder, and institutional equity ownership on firm risk taking. *Academy of Management Journal*, 39(2), 441-463. <https://doi.org/10.2307/256787>
- Xu, C. Y., Zhao, X. Y., & Xu, G. (2020). Risks or opportunities: The impact of economic policy uncertainty on breakthrough innovation in manufacturing industry. *Science & Technology Progress and Policy*, 8.
- Zhang, J., & Zheng, W. P. (2018). Does innovation catch-up strategy inhibit Chinese patent quality?. *Economic Research Journal*, 5.
- Zhang, K. Y., Feng, S., & Xi, Q. M. (2023). Policy effect evaluation of east-west cooperation: From the perspective of factor flow. *China Industrial Economics*, 12, 61-79.
- Zheng, M. N., Li, W. J., & Tan, Y. C. (2024). Technology transfer and high-quality enterprise innovation. *The World Economy*, 3, 66-93.

Zhu, L., & Yi, Z. H. (2020). Can capital market opening-up promote enterprise innovation? Empirical evidence from the Shanghai-Hong Kong Stock Connect program. *Business Management Journal*, 42(2), 40-57.