https://doi.org/10.62836/emi.v5i2.0008

Global Science Publishing

EMI

Economics & Management Information

https://ojs.sgsci.org/journals/emi

Article

Bank Competition, Equity Financing, and Corporate Innovation

Yangfa Zhang

Jiangxi Normal University, Nanchang 330022, China

Abstract: Based on the theories of information asymmetry, information rent and resource dependence, this paper constructs an integrated analytical framework to investigate the impacts of bank market competition and equity financing on corporate innovation. Using panel data of Chinese A-share listed companies from 2013 to 2020, this paper conducts a systematic empirical examination. The results indicate that bank market competition presents a significant inverted U-shaped relationship with corporate innovation: moderate competition promotes innovation, while excessive market dispersion produces an inhibitory effect. Equity financing exerts a continuously increasing positive influence on corporate innovation, and its marginal promotional effect strengthens with the expansion of financing scale. There exists a notable complementary effect between bank market competition and equity financing; the two jointly enhance innovation support through information spillover, collaborative governance and risk diversification mechanisms. Heterogeneity analysis shows that private enterprises and small- and medium-sized enterprises are more sensitive to changes in the two financing channels.

Keywords: bank market competition; equity financing; corporate innovation; complementary effect; inverted U-shaped relationship

1. Introduction

Innovation is the core driving force of high-quality economic development. As China's economic growth enters a new normal and traditional factor dividends gradually diminish, improving enterprises' independent innovation capacity has become an inevitable choice to break through development bottlenecks and cross the middle-income trap. Nevertheless, corporate R&D activities are inherently featured by high investment, long cycle and strong uncertainty, which render firms facing more severe financing constraints than conventional investment projects. Internal capital accumulation is usually insufficient to satisfy the large capital demand of innovation activities, and enterprises are increasingly reliant on external financing [1]. How to alleviate corporate financing constraints via reasonable institutional arrangement of the financial system has become a key concern for both academia and policymakers.

China's financial system presents a dual pattern dominated by bank credit alongside the booming development of capital markets [2]. By the end of 2020, bank loans accounted for more than 60% of the stock of aggregate social financing, while the proportion of corporate equity financing was less than 5%. The core risk control mechanism of bank credit depends heavily on fixed collateral and stable cash flow, which forms a structural mismatch with the asset-light and high-uncertainty characteristics of innovative enterprises [3]. In recent years, a series of reforms including banking joint-stock restructuring and market access deregulation have greatly intensified bank market competition [4]. Meanwhile, the construction of a multi-level capital market has

Received: 23 April 2026; Accepted: 8 May 2026.

* Corresponding: Yangfa Zhang (zhangyangfa1991@163.com)

been steadily advanced. The launch of the Sci-Tech Innovation Board and the implementation of the registration-based IPO system have provided more convenient equity financing channels for innovative firms [5].

Against this background, it remains unclear whether changes in bank market competition affect corporate innovation. Moreover, as two fundamentally different external financing sources, whether bank credit and equity financing act as substitutes or complements in supporting corporate innovation still lacks systematic evidence. Most existing studies examine bank competition and equity financing separately, with insufficient understanding of their interactive mechanism and nonlinear characteristics [6].

This paper aims to establish an integrated theoretical framework to systematically explore the independent and interactive impacts of bank market competition and equity financing on corporate innovation. The theoretical contributions of this paper are threefold. First, it reveals the nonlinear effect of bank market structure transition from monopoly to competition, breaking the linear view that competition is always beneficial and reconciling the theoretical tension between competitive banking and relationship banking [7]. Second, it identifies the complementary mechanism between the banking system and capital market, providing a new intermediate perspective for the debate on bank-based and market-based financial systems [8]. Third, it further explores the heterogeneous effects under different ownership types and firm sizes, offering micro-level evidence for the precise formulation of innovation-supporting policies [9].

2. Theoretical Analysis and Research Hypotheses

2.1. Financing Constraints, Information Rent and Bank Market Competition

The essential cause of corporate financing dilemmas lies in information asymmetry. R&D projects are characterized by high uncertainty and complex profit structures, making it difficult for external investors to accurately evaluate project risks and returns. This substantially aggravates adverse selection and moral hazard problems. Consequently, banks tend to implement credit rationing or require high collateral for innovative projects, resulting in severe financing constraints for corporate innovation.

Information rent theory provides an important theoretical perspective for understanding bank-firm relationships. In long-term cooperation, banks can accumulate substantial soft information regarding firms' operational capacity, repayment willingness and development prospects, thereby forming information monopoly and charging interest rates higher than the competitive market level, namely information rent. Changes in bank market competition directly affect the scale of information rent. When the number of banks increases and competition intensifies, individual banks can no longer maintain high information rent, as firms can switch to other banks for more favorable loan conditions. Driven by competitive pressure, banks tend to lower lending rates, reduce collateral requirements, and actively expand relationship lending, which helps ease financing constraints for innovative activities.

However, excessive bank competition is not always conducive to innovation. Excessively increased bank quantity and fragmented market share may lead to three potential problems. First, maintaining long-term stable bank-firm relationships requires continuous resource input, while excessive competition weakens banks' incentives for long-term relationship investment and induces short-term lending behavior. Banks prefer short-term standardized loans rather than customized long-term loans tailored for innovation projects. Second, information collection of individual banks on a single firm becomes fragmented. Excessively diluted information rent reduces banks' motivation to collect soft information, which further aggravates information asymmetry. Third, over-competition may induce banks to relax credit audit standards and accumulate potential risks. Once encountering external negative shocks, credit contraction will occur and severely restrain corporate innovation [10].

Accordingly, there exists an optimal interval for bank market competition. When the banking market evolves from high monopoly to moderate competition, the promoting effect on innovation dominates; when competition exceeds a critical threshold, the inhibitory effect begins to appear. Therefore, we propose:

H1: *The intensity of bank market competition has an inverted U-shaped relationship with corporate innovation. Moderate competition from monopoly promotes innovation, while excessive market dispersion inhibits innovation.*

2.2. Mechanism of Equity Financing Supporting Corporate Innovation

The incentive effect of equity financing on innovation can be explained from three dimensions: risk matching, maturity matching and governance matching.

First, risk sharing. Equity investors bear limited losses according to their capital contribution, without requiring collateral or fixed interest payment obligations. This feature highly matches the high-risk and high-uncertainty attributes of R&D activities. From the perspective of modern financial theory, debt financing with fixed claim rights is prone to asset substitution and underinvestment under information asymmetry. In contrast, equity financing with residual claim rights allows investors to share future earnings, and thus has higher tolerance for project failure. Therefore, equity financing is inherently a risk-matched financing method for innovative activities.

Second, long-term orientation. Equity capital has no fixed maturity repayment date. Investors pay more attention to long-term value creation rather than short-term financial performance, providing stable long-term capital support for continuous R&D investment. For basic research and original technological innovation with long investment cycles, the patient capital attribute of equity financing is irreplaceable.

Third, governance and supervision. External shareholders participate in major corporate decisions through the board of directors and effectively restrain managerial short-termism. Faced with performance pressure, managers tend to cut R&D expenditure to manipulate short-term profits, while the long-term orientation of equity investors helps correct such myopia and guides resource allocation toward innovative investment.

Furthermore, the promotional effect of equity financing presents an increasing marginal trend. Larger equity financing scale corresponds to a broader investor base, richer external information and social network resources. Large-scale equity financing is also accompanied by stricter due diligence and market supervision, which strengthens corporate governance constraints. In addition, post-financial investment in human capital and R&D equipment exhibits obvious economies of scale, forming a positive feedback loop for innovation [11]. We thus propose:

H2: *Equity financing exerts a continuously increasing positive promotional effect on corporate innovation.*

2.3. Complementary Mechanism between Bank Market Competition and Equity Financing

There are two contradictory viewpoints on the relationship between the banking system and capital market. The substitution hypothesis holds that the two compete for capital supply, and a developed capital market will crowd out bank credit. The complementary hypothesis argues that bank credit and equity financing can form mutually reinforcing interaction through information spillover and collaborative governance. This paper supports the complementary hypothesis and elaborates on two underlying channels.

First, information spillover channel. Banks accumulate abundant private information about firms through long-term relationship lending, including repayment records, supply chain conditions and managerial capability. Such information can indirectly spill over to equity investors through bank underwriting, guarantee business and investment-loan linkage, effectively reducing information asymmetry and improving equity financing efficiency. Meanwhile, public information generated by the capital market, such as stock price volatility, credit rating changes and analyst reports, provides valuable references for banks to evaluate corporate credit, serving as an effective signal mechanism in bank-firm lending. The two-way information flow realizes mutual reinforcement.

Second, joint supervision channel. Under the dual financing structure, banks focus on firms' short-term solvency and cash flow stability, while equity investors pay more attention to long-term strategic layout and corporate governance compliance. The two external supervision forces form an effective complementary mechanism. Bank supervision prevents asset substitution risks faced by equity investors, while equity investor supervision restrains firms' excessive risk-taking and abuse of bank funds. The superimposed supervision improves corporate governance and makes innovation decisions more prudent and efficient.

The popularization of investment-loan linkage and integrated financing practices in China further verifies the existence of this complementary mechanism [12]. Accordingly, we propose:

H3: *Bank market competition and equity financing present a significant complementary effect in supporting corporate innovation, and the two mutually reinforce their promotional impacts.*

3. Research Design

3.1. Sample Selection

This paper selects Chinese A-share listed companies from 2013 to 2020 as the initial research sample. The year 2013 is selected because it marks the accelerated reform of interest rate liberalization and profound structural changes in the banking industry driven by internet finance. The sample screening criteria are set as follows: (1) Exclude financial listed enterprises; (2) Exclude ST, *ST and delisted companies; (3) Exclude samples with serious missing data of R&D expenditure and financial indicators;(4) Conduct 1% winsorization at both tails of all continuous variables to eliminate the interference of extreme values.

3.2. Variable Definition

3.2.1. Dependent Variable

Measured by the proportion of R&D expenditure to operating revenue, reflecting the intensity of corporate innovation input. In robustness tests, the natural logarithm of patent grants is adopted as an alternative indicator.

3.2.2. Core Explanatory Variables

Bank Market Competition (BMS): Adopt the Boone index for measurement [13]. Based on the efficiency structure hypothesis, the Boone index reflects market competition by measuring the profit sensitivity to marginal cost. A higher original Boone index implies weaker competition. We take the negative value of the original index, so that a larger BMS value represents stronger bank market competition.

Equity Financing Scale (EF): Defined as the ratio of net equity financing amount (including IPO, seasoned equity offering and rights issue) to total external financing amount (net equity financing + net debt financing), reflecting firms' relative dependence on equity financing.

Stock Market Performance (SR): Measured by annual cumulative stock return considering cash dividend reinvestment, capturing capital market expectations of corporate value.

3.2.3. Control Variables

Firm Size (SIZE): Natural logarithm of total assets; Leverage (LEV): Total liabilities/total assets; Tobin's Q (TQ): Market value/asset replacement cost; Operating Cash Flow (CF): Net operating cash flow/total assets; Ownership Nature (OWN): State-owned enterprises assigned 1, private enterprises assigned 0; Long-term Bank Loan Ratio (LD): Long-term bank loans/total assets; The models further control for year fixed effects and industry fixed effects.

3.3. Econometric Model Specification

Model A (Test for H1: Inverted U-shaped effect of bank):

$$RD_{i,t} = \alpha_0 + \alpha_1 BMS_t + \alpha_2 BMS_t^2 + \alpha_3 LD_{i,t} + \alpha_4 CF_{i,t} + \alpha_5 OWN_{i,t} + \alpha_6 TQ_{i,t} + \alpha_7 SIZE_{i,t} + \alpha_8 (BMS_t \times LD_{i,t}) + \varepsilon_{i,t}$$

Model B (Test for H2: Increasing effect of equity):

$$RD_{i,t} = \beta_0 + \beta_1 EF_{i,t} + \beta_2 EF_{i,t}^2 + \beta_3 SR_{i,t} + \beta_4 CF_{i,t} + \beta_5 OWN_{i,t} + \beta_6 TQ_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 (EF_{i,t} \times LD_{i,t}) + \varepsilon_{i,t}$$

Model C (Test for H3: Complementary interactive effect):

$$RD_{i,t} = \gamma_0 + \gamma_1 EF_{i,t} + \gamma_2 EF_{i,t}^2 + \gamma_3 SR_{i,t} + \gamma_4 BMS_t + \gamma_5 BMS_t^2 + \gamma_6 (BMS_t \times EF_{i,t}) + \gamma_7 (BMS_t \times SR_{i,t}) + \sum \gamma_k Control_{i,tk} + \varepsilon_{i,t}$$

4. Empirical Results Analysis

4.1. Descriptive Statistics and Correlation Analysis

The mean value of corporate R&D intensity (RD) is 5.12% with a standard deviation of 4.82%, indicating obvious differences in innovation input among listed firms. The mean of bank market competition index is 18.32 with a standard deviation of 2.14, showing a rising trend from 2013 to 2020 and implying continuous intensification of banking competition [14]. The average proportion of equity financing is far lower than that of debt financing, indicating that debt financing still dominates external financing. Correlation results show that

BMS is significantly positively correlated with RD, while BMS squared is significantly negatively correlated with RD, providing preliminary evidence for the inverted U-shaped hypothesis.

4.2. Benchmark Regression Results

Model A results show that BMS is significantly positive and BMS squared is significantly negative at the 1% level, confirming the inverted U-shaped relationship between bank competition and corporate innovation. The inflection point is within the sample interval. When BMS is lower than the threshold, competition promotes innovation; when exceeding the threshold, excessive competition inhibits innovation. The interactive term of BMS and long-term bank loan ratio is significantly positive, indicating that bank competition promotes innovation by increasing long-term credit supply.

Model B results show that both EF and EF squared are significantly positive, verifying the increasing marginal effect of equity financing on innovation. Stock market performance is also significantly positive, suggesting that favorable market conditions enhance equity financing capacity and further boost innovation.

Model C results show that the interactive terms of BMS × EF and BMS × SR are significantly positive, strongly supporting the complementary effect between bank competition and equity financing. The two financing channels produce synergistic promotion on innovation through information spillover and joint governance.

4.3. Heterogeneity Analysis

Grouped by ownership nature, private enterprises are more sensitive to bank competition and equity financing than state-owned enterprises, with larger regression coefficients and lower inverted U-shaped inflection points. Grouped by firm size, small and medium-sized enterprises show stronger sensitivity to changes in financing channels, and the increasing effect of equity financing is more prominent for SMEs [15]. The results are attributed to tighter financing constraints faced by private firms and SMEs.

4.4. Robustness Test and Endogeneity Treatment

This paper conducts multiple robustness checks: replacing the dependent variable with patent grants, replacing Boone index with HHI index, lagging core explanatory variables, adopting instrumental variable method (2SLS), and re-estimating after removing extreme samples and municipal samples. All conclusions remain consistent, confirming the robustness and validity of the research findings.

5. Conclusions and Policy Recommendations

Based on the data of Chinese A-share listed companies from 2013 to 2020, this paper systematically investigates the impact and interactive mechanism of bank market competition and equity financing on corporate innovation. The main conclusions are as follows. First, bank market competition and corporate innovation present an inverted U-shaped relationship, and the current degree of banking competition has approached the optimal threshold. Second, equity financing exerts a continuously increasing positive effect on corporate innovation, with a stronger incentive effect on private enterprises. Third, bank market competition and equity financing have a significant complementary effect, which jointly supports innovation through information spillover and collaborative governance rather than simple substitution.

Accordingly, this paper puts forward the following policy suggestions. First, optimize the competitive structure of the banking industry and avoid excessive competition. Regulators should guide banks to develop differentiated positioning and maintain moderately concentrated and orderly market competition. Second, further improve the multi-level equity financing market, deepen the registration-based reform, and release the increasing innovation incentive effect of equity financing. Third, promote the integrated development of "credit plus equity" financing model, expand investment-loan linkage, and give full play to complementary advantages. Fourth, implement differentiated supportive policies for private enterprises and SMEs to ease their financing constraints. Fifth, improve the national unified credit information platform to reduce systemic information asymmetry between financial institutions and innovative enterprises.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Not applicable.

Conflicts of Interest

The author declares no conflict of interest.

References

1 Yu H. *Research on the Impact of External Financing on Corporate Innovation Input*; Shandong University: Jinan, China, 2021; *pp*. 45–67.
2 Lin Y, Sun X. Banking Structure and Economic Development—Based on China's Provincial Panel Data. *Journal of Financial Research* 2008; **5**: 1–16.
3 Wan X, Ye Y, Fang F. From Collateral to Cash Flow: How Does Indirect Financing Support Innovative Enterprises? *Journal of Financial Research* 2025; **4**: 1–18.
4 Zhang J, Zheng W, Xin F. Banking Deregulation, Structural Competition and Corporate Innovation in China. *China Industrial Economics* 2017; **10**: 118–136.
5 Institute of Finance, Chinese Academy of Social Sciences. Capital Market Opening Empowers Sci-Tech Innovation Development. *China Finance* 2025; **8**: 35–37.
6 Zhang D, Li J. Enterprise Digital Transformation, Bank Competition and Corporate Innovation. *Statistics & Decision* 2025; **2**: 168–172.
7 Wu C, Li W, Tang Q. Bank-firm Relationship, Banking Competition and R&D Investment of Private Enterprises. *Finance & Trade Economics* 2016; **1**: 74–91.
8 Wang H, Yang Z, Li Z. Financing Structure, Institutional Environment and Innovation Capability: Mathematical Analysis and Empirical Test from Micro Perspective. *Economic Research Journal* 2020; **55(5)**: 89–105.
9 Chen S, Zhang H. The Impact of Banking Competition on Firm Innovation Efficiency: Micro-Level Evidence Based on Financial Geographical Structure. *Journal of Banking & Finance* 2025; **152**: 106872.
10 Xiang T, Liu Y, Yang J. The Effects of Bank Competition on Firm R&D Investment: An Inverted-U Relationship. *Chinese Management Studies* 2021; **15**(**3**): 641–666.
11 Chen M, Zou J. Capitalization of R&D Expenditure, External Financing and Corporate Innovation Input. *Monthly Journal of Finance and Accounting* 2022; **24**: 41–48.
12 Wu X, Xu R. Ecological Effect and Screening Effect: An Analysis on the Innovative Financial Mechanism of Capital Market Distinct from Fiscal and Banking Sectors. *Management World* 2025; **41**(**3**): 1–18
13 Boone J. A New Way to Measure Competition. *The Economic Journal* 2008; **118**(**531**): 1245–1261.
14 Yin X. Research on Market Competition, Non-Interest Income and Performance of China's Listed Commercial Banks; Jimei University: Xiamen, China, 2018; pp. 22–35.
15 Hu G, Liang X. Does Bank Competition Alleviate Financing Constraints of SMEs. *Finance and Trade Research* 2019; **30**(**10**): 53–62.