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How Bank Competition Drives the Development of New Productive Forces

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Abstract: This article discusses the mechanism of banking competition in the development of new quality productivity under the background of China's economic transformation. As a key role in the financial market, banks play an important role in scientific and technological research and development, resource allocation and monetary policy transmission. This paper sorts out relevant domestic and foreign studies through literature review and uses variables proposed by existing studies to perform regression. The regression results show that bank competition is positively correlated with the new quality productivity of enterprises, and financial technology has significant adjustments to this. The intermediary effect shows that intensified bank competition can alleviate corporate financing constraints, promote innovation and labor structure upgrading, while financial technology accelerates this process by reducing information asymmetry and improving service efficiency and inclusiveness. Heterogeneity analysis shows that the competitive effect of banks in economically developed regions is more significant, with large enterprises benefiting less, while small and medium-sized enterprises have enhanced their competitiveness due to ease of financing constraints and increased innovation. Therefore, it is recommended to deepen banking reform, optimize the competitive environment, guide credit flow to high-quality innovative enterprises, and at the same time increase the application and innovation of financial technology to achieve innovation-driven sustainable development.

Keywords: Bank competition, new quality productivity of enterprises, degree of development of financial technology, financing constraints

1. Introduction

In the financial market, banks play an important role in encouraging scientific and technological research and development and optimizing resource allocation, and are also an important channel for monetary policy[1-3]. Therefore, in the context of the development of new quality productivity, as China has begun to transform from the industrial economy to the digital economy, new quality productivity - the product of the integration of cutting-edge technology and innovation, is gradually becoming an important force in promoting China's economic transformation and upgrading. Its high-tech characteristics accelerate corporate technological innovation and digital transformation, and also promote the improvement of economic efficiency by optimizing resource allocation. It also plays a key role in promoting social fairness and agricultural modernization. In addition, new quality productivity also profoundly affects the structure and efficiency of the industrial chain. Through

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innovation-driven, it leads the industrial chain to move towards modernization, intelligence and greening[4].

At present, under the pressure of the economy and the increasing financial risks, bank competition has shown a pro-cyclical phenomenon. Due to excessive caution in risk management, some banks have set high thresholds for loan approval and placement, and ownership discrimination and scale discrimination have occurred, resulting in financing difficulties for some small and medium-sized enterprises. The development of new quality productivity mainly depends on enterprise research and development [5]. If a company cannot obtain loan funding support from the bank, the bank may become an obstacle to the development of the company. What is even more dangerous is that it even leads to the emergence of a large number of zombie companies and bankrupt companies.

The intensified degree of competition in the banking industry will help reduce financing constraints for private enterprises and allow funds and labor to flow to efficient enterprises [6]. Bank competition will further promote enterprises' capital investment in R&D and improve the efficiency of enterprises' resource allocation [7]. Therefore, it is of great significance to study how bank competition promotes corporate innovation and thus promotes the development of new quality productivity.

The marginal contribution of this article is as follows: First, this topic will help expand the research vision of new quality productivity in the context of financial technology development, closely link new quality productivity with the development of financial markets, and thus provide us with a more comprehensive understanding. The formation and development of new quality productivity provides new theoretical support. Second, it expanded the research perspective of banking competition, and the paper further explored the potential impact of banking competition on corporate innovation and new quality productivity. Third, the mechanism of action of banks on new quality productivity is analyzed from the perspective of industrial upgrading: Bank competition may promote the development of new quality productivity of enterprises through multiple dimensions such as promoting corporate innovation, stimulating labor structure upgrading, and driving industry green transformation. This discovery not only enriches the economic effect of banking competition, but also provides policy makers with new ideas on how to improve corporate competitiveness by optimizing the competitive environment of the banking industry.

2. Literature review

Competition in the banking industry, as a common phenomenon in the financial industry, has been widely studied in the domestic academic community in recent years. This article focuses on the impact of banking competition on corporate development, especially how it affects the improvement of new quality productivity of enterprises: Huang Yunjue and Ye Dezhu believe that banking competition can improve the efficiency of credit funds redistribution and enable funds to flow to efficient and high-quality enterprises[2]. Wu Jia found that the increase in bank competition significantly improved the availability of corporate bank credit and reduced corporate financing costs and financing constraints[3]. Cai Jing and Dong Yan's research prove that competitive banking market structure will promote corporate R&D and innovation behavior[4]. Fu Yingjun further researched that banking competition mainly promotes corporate innovation by alleviating external financing constraints and reducing financing costs[7]. Wang Hao and others found that bank competition will promote the quality improvement of export products of manufacturing enterprises by alleviating the financing constraints of enterprises[8]. The existing papers mainly focus on corporate financing constraints, enterprise technology upgrades and product quality, and have less research on industrial structure upgrading and the improvement of regional labor comprehensive quality.

The new quality productivity of enterprises is a comprehensive ability to integrate innovative technologies, management innovation, efficient business models and labor quality improvement.

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Driven by scientific and technological innovation, it promotes a significant improvement in total factor productivity [9]. It is generally believed in China that scientific and technological innovation, innovative allocation of production factors, industrial transformation and upgrading, improvement of total factor productivity, and digital economy are the main factors affecting new quality productivity, and some of which can promote the development of new quality productivity in enterprises. When Zhong Changbiao was studying new infrastructure, he found that the technological innovation-driven mechanism, industrial upgrading promotion mechanism and factor allocation optimization mechanism can empower enterprises' high-quality productivity [10]. On this basis, Yao Shujie came to a conclusion by studying digital infrastructure and new quality productivity. The technological innovation of enterprises and the development of enterprise human capital will promote the formation of new quality productivity in enterprises [5].

In terms of theoretical basis, the theoretical basis of this article covers the financial market development theory, the banking competition theory, the information asymmetry theory and the Marxist productivity theory. Among them, the banking industry competition theory explores the impact of bank competition on market efficiency, corporate financing and innovative activities; while the Marxist productivity theory emphasizes that productivity is the fundamental driving force for social development, and new quality productivity, as a new type of productivity, also follows This rule. Combining the two, this paper speculates that intensified bank competition may promote the development of new quality productivity of enterprises.

Analyzing existing articles, we can see that existing papers have relatively little research on bank competition and corporate new quality productivity. After the reform of interest rate market policy, the intensification of bank competition has provided more opportunities for private enterprises to obtain bank loans, which may be used for research and development, thereby promoting the development of new quality productivity of enterprises. As bank competition further intensifies, information asymmetry between banks and enterprises is gradually eliminated, and bank loans will be reconfigured to high-quality and efficient departments and enterprises. By curbing the development of zombie enterprises, labor factors will also flow to high-efficiency enterprises, and enterprises will present labor to the development of heterogeneous demand has led to the further development of labor quality and ultimately promoted the development of new quality productivity of enterprises [11].

3. Mechanism analysis and hypothesis analysis

First, bank competition will promote the development of new quality productivity of enterprises by alleviating corporate financing constraints (SA). As the degree of competition among banks intensifies, loans from large enterprises will gradually become saturated, and competition among banks will focus on obtaining loans from small and medium-sized enterprises, so loan interest rates will also decline. This reduces the company's loan capital cost and thus alleviates the company's financing constraints. In addition, in order to obtain more profits, banks will launch various financial credit products, which will increase the availability of loans and further reduce financing constraints for private enterprises [6]. The reduction of financing constraints will increase the possibility of efficient enterprises and departments obtaining funds, achieving efficient allocation of funds [11]. Therefore, for efficient enterprises that can obtain credit funds from banks by relying on their own operating advantages, these funds can be used to hire high-quality labor, purchase efficient labor objects, and update labor factors. These resources are allocated It has a positive effect on improving the new quality productivity of enterprises[11].

Second, bank competition will promote corporate innovation and drive the development of new quality productivity of enterprises. As the competition for banks intensifies, the information asymmetry between banks and enterprises will also be alleviated, which enhances the efficiency and

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professionalism of banks in credit issuance based on the business conditions of enterprises. Therefore, in order to obtain credit funds from banks, the good companies will take the initiative to disclose the company's business information to the society, which makes companies with poor operating conditions have to take measures to improve the business efficiency of the company. Among them, the most direct measures are innovation in technology, management and data. In addition, policy-based credit issuance will also provide financial support for enterprise innovation, thereby promoting the cultivation and development of new quality productivity of enterprises [1].

Third, bank competition will drive the labor structure of enterprises in the region to promote the development of new quality productivity of enterprises. In the path of affecting labor resource allocation for bank competition, Lu Wenli mentioned that when corporate financing constraints are reduced and corporate innovation efforts are intensified, enterprises will experience heterogeneity in labor demand, and high-efficiency departments will reduce the average labor force. increase the demand for high-quality talents. As an indispensable labor factor for production factors, the gathering effect of high-quality talents will increase the R&D, production and sales efficiency of enterprises, and thus improve the productivity of all factors, and ultimately drive the development of new quality productivity of enterprises [9]. Based on this, this paper proposes Hypothesis 1 (H1): Intensified bank competition will have a significant positive impact on the development of new quality productivity of enterprises.

In the process of bank competition affecting the new quality productivity of enterprises, the degree of development of financial technology plays a regulatory effect. It can significantly reduce information asymmetry between banks and enterprises, improve service efficiency and inclusiveness, and provide innovative services such as big data risk control and intelligent credit approval, so that banks can more accurately assess corporate credit risks and lower loan thresholds, further alleviate financing constraints. Especially for small and medium-sized enterprises, financial technology breaks the limitations of the traditional credit model and improves the availability and convenience of loans. Therefore, this paper proposes Hypothesis II (H2): The development of regulating variables will significantly enhance the impact of bank competition on the new quality productivity of enterprises.

4. Variable setting

4.1. Explanation variable setting

Regarding the relationship between bank competition and new quality productivity of enterprises, the explanatory variables of the paper choose the degree of bank competition, and draw on the research methods of Cai Jing and Dong Yan— Hefendal Index (HHI) and Banking Concentration Indicators (CR). The larger the value, the lower the degree of competition among banks.

4.2. Explained variable setting

According to Song Jia, the new quality productivity of enterprises (Npro) can be measured from the three constituent elements of labor, namely workers, labor objects, and labor factors.

4.3. Control variable settings

Referring to the empirical analysis of the existing article, the following control variables were selected, namely, corporate profitability (ROA): ratio of net profit to total assets, equity concentration (OC): shareholding ratio of the largest shareholder, and corporate age (AGE), Board size (BD): Natural logarithm of the number of directors, Enterprise assets (ASSET): Natural logarithm of the total assets of the enterprise, Innovation ability (Create): The proportion of the number of invention patent

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applications in the number of patent applications, debt-to-asset ratio (LEV) and the Big Four audit firms (AUDIT).

4.4. Intermediary variable setting

This article selects financing constraints (SA), enterprise innovation (create), and labor structure (degree, here we simply use the educational structure, that is, bachelor's degree or above The ratio of the number of people to the total number of workers) as intermediary variables.

4.5. Model setting

$$Npro_{i,t} = \alpha_0 + \alpha_1 HHI_{c,t} + \sum \beta_l Control_{i,t} + \delta_t + \gamma_k + \varepsilon_{i,t} \quad (1)$$

In the model, the subscripts i and t represent the enterprise and year respectively. The interpreted explanatory variable ($Npro_{i,t}$) "new quality productivity" is the new quality productivity level of the enterprise i in t year, and the core explanatory variable bank competition degree ($HHI_{c,t}$) represents the competitive intensity of city banks in t year, Controls is a series of control variables, δ_{year} and$\gamma_{industry}$ represent the year fixed effect and industry fixed effect, respectively, and $\varepsilon_{i,t}$ are the random error terms. k represents the industry k where i is located, and l represents the number of control variables.

4.6. Source of data

This article takes Shanghai and Shenzhen A-share listed companies from 2012 to 2021 as research samples, eliminates samples with serious data missing, samples with lack of important financial indicators, samples with ST or *ST and other operating abnormalities, and finally obtains 29,935 observations and all The variable is 1% shortened. Among them, the relevant data for enterprise research and development comes from the Wande Database (Wind).

5. Empirical test

5.1. Descriptive regression

The descriptive statistical analysis results of the main variables are shown in Table 1. The mean of new quality productivity (NQP) is 4.95, the standard deviation is 2.26, and the 99-digit percentile is 12.13, which is quite different from the 1-digit percentile, indicating that there is a big gap in new quality productivity of enterprises. The mean of bank competition degree (HHI) is 0.11 and the standard deviation is 0.04, and the remaining control variables are also very small in contrast to existing literature.

Table 1: The descriptive analysis of each variable is as follows

	N	Mean	SD	1st Perc.	99th Perc.	t-value
Npro	29935	4.95	2.26	0.94	12.13	379.08
HHI	29938	0.11	0.04	0.05	0.26	418.38
PE	25963	3.77	0.94	2.01	6.42	645.10
audit	30545	0.06	0.23	0.00	1.00	43.22
ESG	30010	4.07	0.96	1.50	6.00	733.52
Dt	30210	2.85	1.24	0.00	5.60	399.92
CR	29935	0.57	0.20	0.13	0.93	504.38

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5.2. Benchmark regression

The benchmark regression results of the degree of bank competition on the new quality productivity of enterprises are as follows. Column (1): no control variables added and no year or industry impact was fixed; Column (2): no control variables added but year or industry impact was fixed; Column (3): no year or industry impact was fixed after joining the enterprise control variable; Column (4): control variables were added and fixed. The results show that regardless of whether the control variable is added or the control industry and year, the coefficient of bank competition on the new quality productivity of enterprises is significantly negative at the 1% level. Increased HHI value means weakening competition, so improving bank competition can promote the new quality productivity of enterprises ($p<0.01$). According to the list (4), for every unit increase in bank competition, the average increase in the new quality productivity of enterprises will increase by 1.4582 units. In terms of control variables: The more profitable the enterprise's profitability is, the more Strong, with four major audits, better ESG performance, and greater digital transformation, all are conducive to the formation of new quality productivity of enterprises, while a higher current asset ratio is not conducive to the formation of new quality productivity of enterprises.

Table 2: The benchmark regression results are as follows

variable	Npro	Npro	Npro	Npro
	(1)	(2)	(3)	(4)
HHI	-3.29***	-1.07***	-2.96***	-1.46***
	(0.31)	(0.30)	(0.32)	(0.31)
Control variables	NO	NO	YES	YES
Fixed effect	NO	YES	YES	YES
Number	30545	30545	26463	26463
Adjust R-sq	0.004	0.221	0.142	0.290

5.3. Robustness test

To explore the reliability of benchmark regression, this paper conducted a robustness test on benchmark regression results, including replacing the interpreted variable (column 1), replacing the interpreted variable (column 2), controlling the missing variable (column 3) and grouping regression (column 4, 5)

Replace explanatory variables: Since the existing articles have CR in addition to HHI, the article also selected CR3 as the explanatory variable for regression, and the results were significant and passed the 1% test. The coefficient is negative, indicating that the degree of bank competition has a positive effect on the new quality productivity of enterprises. Replace the interpreted variable: According to the practices of Zhang Xuelan and others, the article selected the total factor productivity of the enterprise as the interpreted variable. According to the robustness test, HHI's regression results on the total factor productivity of the enterprise are significant, and the coefficient symbol remains unchanged, which is consistent with the benchmark regression results. Control omission variables: In order to alleviate the endogenous problems caused by omission variables, the article has added variables such as the scale, income, age of the enterprise that may affect the development of new quality productivity in the robustness test, such as: current asset ratio (CR), inventory turnover Rate (ITR), total operating income (Income), debt-to-asset ratio (Lev), total assets (Asset), and enterprise age (age). After these variables were added, the coefficient of HHI was still significantly negative, indicating that the conclusions of this paper were not affected by other factors, and the empirical results were robust and reliable. Sub-sample regression: We can observe whether the impact of bank

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competition on the new quality productivity of enterprises is consistent in different sub-samples. In this regard, the sample enterprises are divided into two sub-samples based on the enterprise scale, and the sample enterprises are divided into two sub-samples of large enterprises and small and medium-sized enterprises, so as to evaluate the impact of bank competition on the new quality productivity of enterprises of different sizes. The coefficients of the explanatory variables in the grouped regression results remain significant.

Table 3: The results of robustness test are as follows

variable	Npro	TFP_OP	Npro	Npro	Npro
	(1)	(2)	(3)	(4)	(5)
HHI		-1.45***	-1.33***	-36.91***	-35.36***
		(0.10)	(0.31)	(6.41)	(4.46)
CR3	-36.85***				
	(4.32)				
Control variables	NO	NO	YES	YES	YES
Fixed effect	NO	NO	YES	YES	YES
Number	30545	29458	26141	8083	16308
Adjust R-sq	0.002	0.267	0.298	0.298	0.339

5.4. Intermediary effect inspection

According to the previous article, there are three key paths for bank competition to affect the development of new quality productivity of enterprises: First, corporate financing constraints (SA) are reduced, bank competition has intensified, reduced loan interest rates, increased loan availability, and helped high-efficiency enterprises to obtain funds to improve their access to high-efficiency enterprises. productive forces. Second, corporate innovation activities (create) are strengthened, and competition intensifies, prompting enterprises to improve operational efficiency through technological innovation and management innovation, obtain credit support, and promote the development of new quality productivity. Third, the labor structure of enterprises in the region has been upgraded, and the demand for high-quality talents has increased in high-efficiency departments. The talent gathering effect has improved R&D, production and sales efficiency, improved the productivity of all factors, and ultimately driven the development of new quality productivity of enterprises. The test results show that the regression coefficients of the explanatory variable HHI and the three mediating variables are significantly negative, which shows that as HHI, that is, the degree of competition in banks increases, the values of the three mediating variables are also increasing, showing a significant positive effect.

Table 4: The mediation effect regression results are as follows

variable	SA	create	Degree	Npro
	(1)	(2)	(3)	(4)
HHI	-0.21***	-1.45***	-1.36***	-36.91***
	(0.03)	(0.10)	(0.31)	(6.41)
Control variables	NO	NO	YES	YES
Fixed effect	NO	NO	YES	YES
Number	30545	29458	26141	8083
Adjust R-sq	0.002	0.267	0.298	0.298

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5.5. Heterogeneity analysis

Ban Yuanhao pointed out that generally speaking, the eastern coastal areas have developed economies, rich financial resources, sufficient innovation funds for enterprises, less financing constraints, and high-tech enterprises have great innovation vitality. Therefore, bank competition has a greater effect on promoting the new quality productivity of enterprises in areas with high economic development. In order to verify the hypothesis, this paper selects the degree of economic development as a classification indicator and divides it into two groups based on its mean. The regression results are shown in Table (1) (2) below. The results show that the difference in coefficients between groups is significantly negative ($p<0.01$). It shows that the degree of bank competition has promoted the new quality productivity of enterprises in economically developed regions more and more significant.

In addition, the scale of the enterprise will also have a heterogeneous impact on the development of the enterprise's new quality productivity. The article divides the sample into large enterprises and small and medium-sized enterprises according to its scale. Empirical tests found that the coefficient is significantly positive, indicating that the increase in bank competition has a more positive effect on the development of new quality productivity of small and medium-sized enterprises. The reason is: Due to the existence of loan ownership and scale discrimination, large enterprises have relatively advantages in financing, but the transformation costs and risks are high, and the development of new quality productivity is relatively slow. In contrast, small and medium-sized enterprises usually face more serious financing constraints due to their small scale. Intensified bank competition will significantly lower the financing threshold for small and medium-sized enterprises and make it easier to obtain loans for technological innovation and market expansion. Moreover, it has strong flexibility and innovation, and the new quality productivity has developed faster.

It can be concluded that bank competition has a heterogeneous impact on the economic development level of enterprises in the region and the development of new quality productivity of enterprises of different sizes. The economic development level of the region is high, and bank competition has a more obvious effect on promoting new quality productivity of enterprises; large enterprises have relatively low benefits due to factors such as scale and transformation costs; while small and medium-sized enterprises have a ease of financing constraints and innovative ability. Improve and show stronger competitiveness and development potential in the environment of bank competition.

Table 5: The results of heterogeneity analysis are as follows

variable	Developed areas	Undeveloped areas	Small scale enterprises	Large-scale enterprise
	(1)	(2)	(3)	(4)
HHI	-5.80***	-0.38	0.047	-1.52***
	(0.65)	(0.34)	(1.38)	(0.32)
Control variables	YES	YES	YES	YES
Fixed effect	YES	YES	YES	YES
Number	14128	12335	11489	14974
Adjust R-sq	0.252	0.337	0.299	0.295
Component coefficient differences	-2.97***		2.074***	

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5.6. Regulation effect test

As mentioned above, the degree of development of financial technology will affect the intensity of the intensification of bank competition to promote the new quality productivity of enterprises. Therefore, in order to verify H2, the article selected the digital inclusive financial index as an indicator. According to the results of the table below, it can be seen that the degree of development of financial technology plays a regulating role in promoting the new quality productivity of enterprises by intensifying bank competition, and the coefficient of the cross-border term is significantly negative, indicating that with the further development of financial technology, the degree of bank competition has a stronger role in promoting the new quality productivity of enterprises.

Table 6: The results of the regression of the regulation effect are as follows

variable	Npro	Npro
	(1)	(2)
HHI	-1.73***	-5.80***
	(0.39)	(0.65)
FT	-0.39***	0.55***
	(0.14)	(0.21)
Handle the term		-3.12***
		(0.62)
Control variables	NO	YES
Fixed effect	NO	YES
Number	27105	23596
Adjust R-sq	0.221	0.309

6. Conclusion

This study focuses on the driving role of China's banking industry competition in the development of new quality productivity and explores the regulatory effect of financial technology. The study found that the intensified bank competition significantly promoted the development of new quality productivity of enterprises, and this conclusion remains true after controlling for various internal and external factors of enterprises. Bank competition has effectively improved the new quality of enterprises through multiple dimensions such as stimulating corporate innovation, optimizing labor structure, and reducing financing constraints. The development of financial technology has played an important regulatory role in this process. The widespread application of financial technology not only innovates the financial service model, but also improves service efficiency and coverage. It further intensified the competition among banks, encouraged banks to provide financial services such as financing to enterprises efficiently, and accelerated the formation of new quality productivity of enterprises. The study also found that the impact of bank competition on the new quality productivity of enterprises is heterogeneous in different regions and enterprise scales. In economically developed areas, bank competition has a more significant role in promoting the new quality productivity of enterprises; while for small and medium-sized enterprises, they show stronger competitiveness in the environment of bank competition.

Based on the above conclusions, this study puts forward the following suggestions: 1. The government should continue to deepen banking reform, optimize the competitive landscape of the banking industry, reduce unnecessary administrative intervention, create fair and transparent competitive competition, strengthen financial technology supervision. 2. Further promote balanced regional economic development, narrow economic gaps, enhance the overall economic sustainable

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development capabilities, and increase support for small and medium-sized enterprises to solve their financing and innovation problems. 3. Banks should improve internal management efficiency, use financial technology to improve business capabilities and risk management levels, and reduce information asymmetry. 4. Banks should pay attention to the needs of different enterprises, especially increase credit support for small and medium-sized enterprises, optimize the credit structure, promote corporate innovation and labor structure upgrading, and thus promote the development of new quality productivity.

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