

The Mechanism and Spatial Effects of FinTech Empowering New Quality Productive Forces

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Abstract

As a new round of technological revolution and industrial transformation advances, it is essential to clarify the pathways and boundaries through which FinTech empowers new quality productive forces. Based on panel data from 257 prefecture-level cities in China from 2015 to 2024, this paper constructs a two-way fixed-effects model for empirical analysis. The results show that FinTech significantly promotes local new quality productive forces, with technological innovation and industrial structure upgrading serving as important mechanisms. Further analysis indicates that FinTech promotes the development of local new quality productive forces while generating negative spillovers to neighboring regions. After decomposing the effects into short-run and long-run components, the short-run effect is found to be a siphon effect that exerts an inhibitory influence, whereas the long-run effect becomes positive through spillover effects. Accordingly, enterprises, financial institutions, and governments should take into account regional development heterogeneity, improve the precision of FinTech adaptation, coordinate local cultivation with interregional linkage, refine overall coordination mechanisms, and promote the development of new quality productive forces.

Keywords

FinTech; New Quality Productive Forces; Two-way Fixed-effects Model; Spatial Spillover.

1. Introduction

As a new round of technological revolution and industrial transformation advances, an innovation wave centered on artificial intelligence and quantum information is reshaping the global competitive landscape. Against this background, the strategy of “accelerating the formation of new quality productive forces and strengthening new drivers of development” has emerged. In recent years, the CPC Central Committee has made a series of deployments around high-quality development, all of which place the acceleration of new quality productive forces in a prominent position in the construction of a modern industrial system and the advancement of Chinese modernization. Unlike the traditional path of productive force development, new quality productive forces place greater emphasis on the leading role of scientific and technological innovation. With their high-tech, high-efficiency, and high-quality characteristics, they bring about a leap in laborers, labor materials, labor objects, and their optimized combinations, and substantially improve total factor productivity [1].

Among the many factors influencing the formation of new quality productive forces, the deep integration of the financial system and the science and technology system is increasingly becoming a core force that cannot be ignored [2, 3]. The combination of finance and technology has changed the traditional service model of finance, lowered customer access thresholds, and helped improve the quality and efficiency of financial development and allocate financial resources more precisely [4]. Specifically, relying on technologies such as big data, cloud computing, and blockchain, FinTech promotes the transformation of financial services,

significantly enhances the financial system's ability to identify innovation entities and control innovation risks, and effectively remedies the deficiency of traditional financial supply[5]. However, such technological means are characterized by concentration, procyclicality, and volatility, which means that while strengthening the service attributes of finance, they may also bring micro- and macro-level risks[6]. Therefore, how to give full play to the advantages of FinTech while defusing potential risks is a question worthy of in-depth study.

Based on the above analysis, this paper constructs an analytical framework combining "benchmark effects" and "spatial spillovers." First, based on panel data of Chinese prefecture-level cities, a two-way fixed-effects model is constructed to systematically examine the benchmark effect of FinTech on new quality productive forces, and mechanism tests are used to identify the transmission channels. Second, a dynamic spatial Durbin model (SDM) with two-way fixed effects is constructed to distinguish the spatial transmission paths under short-run shocks and long-run equilibrium, and to examine the dynamic characteristics of the local effects and neighboring spillover effects of FinTech on new quality productive forces. Finally, corresponding policy recommendations are proposed based on the research conclusions.

2. Literature Review

Compared with traditional productive forces, new quality productive forces, as a new form of productive forces under the concept of high-quality development, have become a hot topic in academic research[7]. In terms of definition, new quality productive forces are an important innovation developed from the Marxist theory of productive forces; they are characterized by new business forms, new directions, new layouts, and new fields, and are a key factor in future economic and social development[8, 9]. Regarding measurement, current methods mainly fall into three categories: the multidimensional indicator system method[10], the total factor productivity (TFP) perspective[11], and the process-oriented measurement method[12], which together constitute a relatively comprehensive quantitative measurement system.

Regarding the impact of FinTech on new quality productive forces, no consensus has yet been reached in academia[13]. Some scholars argue that financial and technological development can significantly improve the level of new quality productive forces through the technological marketization mechanism[14], by promoting industrial synergy[15], and by improving the matching degree with the real economy[16]. However, other scholars hold that FinTech may aggravate financial risks and data monopoly in its early stage of development[17]; moreover, when the institutional environment is imperfect or financial regulation lags behind, the promoting effect of FinTech on innovation performance is insignificant or even temporarily negative[18]. At present, more scholars emphasize that the impact of FinTech on new quality productive forces is affected by policy drivers, human capital, financial regulation, and regional development levels, and presents nonlinear characteristics[19, 20].

It is worth noting that, from a spatial perspective, the distribution of new quality productive forces in China shows strong spatial correlation[21]. At the same time, the impact of FinTech on new quality productive forces shows significant spatial spillover effects and regional heterogeneity; that is, regions with higher financial levels will generate a certain external force in their growth and exert greater influence on the finance and economy of surrounding regions through spatial spillover effects and regional connectivity mechanisms[22]. Regional differences are reflected in the fact that the promoting effect of FinTech on new quality productive forces is more significant in regions with higher economic development levels, stronger innovation capacity, or higher degrees of financial agglomeration[23]; in less developed regions, weak economic and industrial foundations, together with relatively poor education levels, seriously hinder production and creation[24].

In summary, existing literature still has some shortcomings. First, at the level of variable measurement, the scope of indicator selection in existing studies is seldom refined at the city level. Second, in terms of research methods, most existing results rely on static spatial econometric models to conduct spatial empirical analysis, which only characterizes the spatial correlation features of FinTech at a specific time cross-section. Therefore, this paper further deepens the research in terms of city-level measurement and dynamic spatial spillovers. Specifically, city-level measurement can more accurately capture the micro mechanisms of technology diffusion and factor mobility and avoid the information loss caused by provincial data aggregation. On this basis, relying on a dynamic spatial Durbin model to distinguish long-run and short-run spatial transmission paths, this paper reveals the evolutionary characteristics of FinTech's local effects and neighboring spillovers and comprehensively uncovers the internal logic of the development of new quality productive forces.

3. Theoretical Mechanism and Research Hypotheses

3.1. Benchmark Effect Analysis

The promoting effect of FinTech on new quality productive forces is reflected at two levels: the “empowerment effect” and the “resource allocation effect.” At the empowerment level, by means of unstructured data mining and real-time risk profiling, FinTech converts “soft information” such as firms’ patent value, R&D trajectories, and supply-chain credit into measurable “hard assets,” significantly lowering the financing threshold and capital costs of innovation entities[25]. At the resource allocation level, relying on algorithm-driven intelligent matching, FinTech breaks the spatial and temporal constraints of financial services and guides financial resources to flow from traditional sectors with diminishing marginal output to strategic emerging industries and future industries with high growth potential and high technological content[26]. In recent years, academia has conducted extensive discussions on the relationship between FinTech and new quality productive forces. At the macro level, Zhu Bo and Zeng Lidan [13] based on city-level panel data, show that the development of digital finance has a significant positive driving effect on regional new quality productive forces. At the micro level, using the super-efficiency SBM method, Huang Jie et. al [27] find that the development of digital finance can effectively improve firms’ new quality productive forces. Based on the above analysis, this paper proposes:

Hypothesis 1: FinTech has a promoting effect on new quality productive forces.

3.2. Influence Mechanism Analysis

The core of FinTech’s promotion of technological innovation lies in easing financing constraints. On the one hand, relying on big-data risk control, machine learning algorithms, and blockchain certification, FinTech converts “soft information” such as firms’ patent value, R&D trajectories, and supply-chain credit into measurable “hard assets,” significantly reducing information asymmetry between banks and enterprises[28]. On the other hand, through diversified financing channels such as P2P lending, equity crowdfunding, and supply-chain finance, FinTech broadens the sources of funds for innovation entities and reduces their excessive reliance on traditional bank credit[25]. From the perspective of the transmission logic of technological innovation empowering new quality productive forces, the core role of technological innovation is reflected in the qualitative leap of production factors. Liu Xinghua and Yuan Qijing [29] point out that digital finance promotes the formation of new quality productive forces by empowering technological innovation, promoting the intelligent upgrading of labor materials and the green and digital expansion of labor objects. Based on this, this paper proposes:

Hypothesis 2: FinTech exerts a positive effect on new quality productive forces by promoting technological innovation.

From the perspective of the path through which FinTech promotes industrial structure upgrading, its core lies in improving the efficiency of resource allocation among industries. Zhao Shufang et. al [26] find that digital finance significantly promotes the optimization of industrial structure by reducing information asymmetry and transaction costs. From the perspective of the transmission logic of industrial structure upgrading empowering new quality productive forces, the advancement of industrial structure can give rise to new industrial clusters, form network effects through knowledge spillovers and technology diffusion, and accelerate the industrial application of innovation achievements; the rationalization of industrial structure, by reducing factor mismatch and structural imbalance among industries, lowers the operating costs of the economic system and releases more resource space for innovation activities. Wang Wen and Sun Yingxue [30] find that industrial structure upgrading is a key path to cultivating new quality productive forces; by promoting the evolution of industries toward digitalization, greening, and advancement, it can effectively reduce dependence on traditional factors and improve total factor productivity. Based on this, this paper proposes:

Hypothesis 3: FinTech exerts a positive influence on new quality productive forces by promoting industrial structure upgrading.

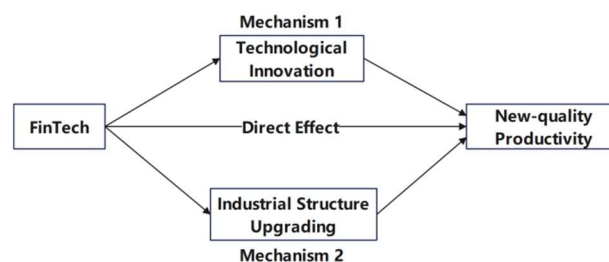


Figure 1. Framework of the mechanism

3.3. Spatial Spillover Effect Analysis

The impact of FinTech on regional new quality productive forces is reflected not only at the local level but also in spatial interaction effects through factor mobility, resource competition, and technology diffusion. From a short-run perspective, the development of FinTech may first manifest as a “siphon effect.” Regions with higher FinTech development levels often have more complete digital infrastructure and a better innovation ecosystem, and can attract key innovation factors such as capital, talent, and data from surrounding areas through more convenient financing channels and a better business environment[31]. This cross-regional agglomeration of factors, while improving local new quality productive forces, may cause neighboring regions to face difficulties such as the loss of innovation factors, insufficient industrial supporting capacity, and absence of financial services, thereby producing negative spatial spillovers on new quality productive forces[32]. However, from a long-run perspective, the spatial effect of FinTech is not static. With the unification of FinTech technical standards, the maturity of service platforms, and the strengthening of cross-regional coordination demand in industrial chains, the knowledge spillovers, technology exports, and industrial linkages of FinTech will drive its spatial effect from negative to positive[33]. Based on the above analysis, this paper proposes:

Hypothesis 4a: The effect of FinTech on local new quality productive forces is positive, while its effect on neighboring regions is negative.

Hypothesis 4b: After effect decomposition, the effect of FinTech on local new quality productive forces is positive; in the short run, affected by the “siphon effect,” the effect on neighboring regions is negative; in the long run, affected by the “spillover effect,” the effect on neighboring regions also becomes positive.

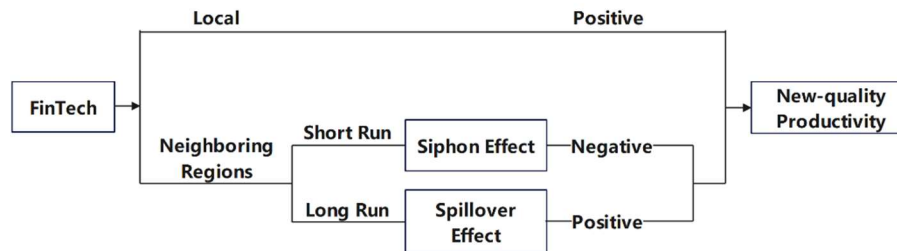


Figure 2. Framework of spatial effects

4. Model Specification and Variable Selection

4.1. Model Specification

4.1.1. Benchmark Regression Model

Combining the preceding analysis, to test the effect of FinTech on new quality productive forces, this paper follows Sun Li and Zhang Jie [34] and constructs the following two-way fixed-effects benchmark regression model, as shown in Equation (1):

$$npq_{it} = \alpha_0 + \alpha_1 fintech_{it} + \sum_{k=2}^n \alpha_k Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where npq_{it} is the dependent variable; $fintech_{it}$ is the core explanatory variable and α_1 is its coefficient to be estimated; $Controls_{it}$ is the vector of control variables; α_0 is the constant term; μ_i is the city fixed effect; λ_t is the year fixed effect; ε_{it} and is the random disturbance term.

4.1.2. Mechanism Test Model

Following Jiang Ting [35], this paper focuses on testing the direct impact of FinTech on the mechanism variables, as shown in Equation (2):

$$Mid_{it} = \beta_0 + \beta_1 fintech_{it} + \sum_{k=2}^n \beta_k Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

Where Mid_{it} is the mechanism variable and β_1 is the coefficient to be estimated.

4.1.3. Spatial Econometric Model

To simultaneously capture the combined influence of geographical proximity and economic linkage on spatial spillover effects, this paper follows Shao Shuai et. al [36] and constructs a nested spatial weight matrix of geography and economy, as shown in Equation (3):

$$w_{ij}^{de} = \begin{cases} \varphi \cdot w_{ij}^d + (1 - \varphi) \cdot w_{ij}^e, & i \neq j \\ 0, & i = j \end{cases} \quad (3)$$

Where φ is the weight coefficient of the geographical distance matrix in the nested matrix. Following Shao Shuai et. al [36], this paper sets $\varphi = 0.5$ to balance the relative contributions of geographical proximity and economic linkage to spatial spillover effects.

On this basis, this paper constructs a spatial Durbin model under two-way fixed effects, as shown in Equation (4):

$$\begin{aligned} npq_{it} = & \rho W npq_{it} + \varphi_1 fintech_{it} + \sum_k \varphi_k Controls_{it} \\ & + \eta_1 W fintech_{it} + \sum_k \eta_k Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (4)$$

Where ρ is the spatial autocorrelation coefficient; W denotes the spatial weight matrix; φ_1 and η_1 represent the coefficients of explanatory variables and their spatial lag terms.

To further capture the dynamic adjustment process of the impact of FinTech on new quality productive forces, this paper constructs a dynamic spatial Durbin model (DSDM) on the basis of Equation (4), as shown in Equation (5):

$$\begin{aligned} npq_{it} = & \tau npq_{i,t-1} + \rho W npq_{it} + \theta W npq_{i,t-1} + \varphi_1 fintech_{it} + \sum_K \varphi_k Controls_{it} \\ & + \eta_1 W fintech_{it} + \sum_K \eta_k Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \end{aligned} \quad (5)$$

Where the coefficient τ reflects the persistent impact of the previous period's new quality productive forces on the current period; the coefficient θ reflects the spatial radiation effect of neighboring regions' lagged new quality productive forces on the local current period.

4.2. Variable Description and Data Sources

4.2.1. Dependent Variable

Following Wang Jue and Wang Rongji [10] and Han Wenlong et al. [37], this paper constructs a comprehensive evaluation system covering three dimensions-laborers, labor objects, and labor materials-and uses the entropy weight method to assign weights, thereby obtaining the level of new quality productive forces of prefecture-level cities.

4.2.2. Explanatory Variable

Following Shen Yue and Guo Pin [38], this paper uses text mining of Baidu search indices for FinTech-related keywords and employs the entropy weight method to construct a FinTech index. The indicator setting and keyword selection refer to Sheng Tianxiang and Fan Conglai [39].

4.2.3. Mechanism Variables

Technological innovation (TI): Following Liu Jinhua et al. [40], the total number of patent applications is used in logarithmic form to measure regional technological innovation. Industrial structure upgrading (ISU): Following Gan Chunhui et al. [41], the ratio of the added value of the tertiary industry to that of the secondary industry is used to measure the level of industrial structure upgrading.

4.2.4. Control Variables

Population density (pop): Following Deng Xiaojun et. al [21], the ratio of the year-end resident population to the total administrative area is used in logarithmic form. Urbanization level (urb): Following Zhao Tao et. al [42], the proportion of urban resident population to total resident

population is used. Social consumption level (con): Following Song Ze [43], the ratio of total retail sales of consumer goods to regional GDP is used. Degree of openness (open): Following Shen Yue and Guo Pin [38], the ratio of foreign direct investment to regional GDP is used.

4.3. Data Sources

This paper takes 257 prefecture-level cities in China from 2015 to 2024 as the research object and comprehensively uses multiple sources, including provincial statistical yearbooks, prefecture-level city statistical yearbooks and statistical bulletins, Baidu search indices, and the Wind database. Missing data for some years are supplemented by linear interpolation, and individual extreme outliers are winsorized at the 1% level.

5. Empirical Results and Analysis

5.1. Benchmark Regression Analysis

Table 1 reports the benchmark regression results. The estimated coefficients of FinTech are significantly positive at the 1% level, indicating that FinTech has a significant positive promoting effect on new quality productive forces. The reason is that the core carriers of new quality productive forces are scientific and technological innovation and industrial innovation, while innovation activities generally feature large investment, long cycles, and high risks. Compared with the traditional financial system, FinTech, relying on big data, artificial intelligence, and blockchain technologies, can effectively reduce information search costs, allocate financial resources precisely to scientific and technological innovation, ease financing difficulties, and provide sustained financial support for the formation of new quality productive forces. Hypothesis 1 is verified.

Table 1. Benchmark Regression Results

Variables	(1)
	npg
fintech	1.1240***
	(4.71)
pop	5.9045***
	(22.83)
urb	-0.1111**
	(-2.22)
con	0.0316
	(1.01)
open	-0.4902***
	(-5.09)
_cons	3.8339***
	(11.54)
N	2570
R2	0.9892
Region fixed effects	Yes
Time fixed effects	Yes

*Note: t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

5.2. Robustness Tests

This paper conducts robustness tests in the following ways. First, the dependent variable is replaced by using principal component analysis (PCA) to re-measure the development level of

new quality productive forces as an alternative indicator. Second, the control variable economic development level (eco) is added. Third, the four municipalities directly under the central government, namely Beijing, Shanghai, Tianjin, and Chongqing, are excluded. The results are reported in Table 2 and show no substantial difference from the benchmark regression results, indicating that the results are robust.

Table 2. Robustness Tests

Variables	(1)	(2)	(3)
	r_pca	r_control	r_city
fintech	0.2020***	0.9209***	0.7407***
	(3.70)	(3.88)	(3.80)
pop	0.8912***	6.0393***	5.8532***
	(15.09)	(23.59)	(29.06)
urb	-0.0140	-0.0833*	-0.0666*
	(-1.22)	(-1.68)	(-1.67)
con	0.0076	0.0232	0.0255
	(1.06)	(0.75)	(1.00)
open	-0.1208***	-0.2216**	-0.2197***
	(-5.49)	(-2.19)	(-2.80)
eco		0.6380***	
		(7.69)	
_cons	-0.2807***	4.1161***	3.8404***
	(-3.70)	(12.47)	(14.50)
Region fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
N	2570	2570	2530

*Note: t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

5.3. Mechanism Tests

The mechanism test results are reported in Table 3. Column (1) shows that the development of FinTech significantly promotes the technological innovation level of prefecture-level cities. Small, medium, and micro technology enterprises and traditional manufacturing enterprises in transition in China generally face financing difficulties such as insufficient collateral and information opacity. FinTech reduces information asymmetry between banks and enterprises through digital means and broadens the coverage of financial services. After financing constraints are eased, enterprises' willingness and ability to invest in R&D improve, supporting production optimization and technological breakthroughs. The spillover effect of technological innovation promotes the diffusion of knowledge along industrial chains and ultimately improves total factor productivity. Hypothesis 2 is verified. Column (2) shows that the coefficient of industrial structure upgrading (ISU) is also significantly positive. In light of China's reality, FinTech can optimize the allocation of financial resources, guide social capital from traditional industries with excess capacity to strategic emerging and high-tech industries, and promote the transfer of production factors from low-efficiency sectors to high-efficiency sectors. The formation of new industrial clusters and new business forms lays an industrial foundation for the qualitative and efficiency leap of productive forces. Hypothesis 3 is verified.

Table 3. Mechanism Tests

Variables	(1)	(2)
	TI	ISU
fintech	0.6220*** (18.12)	0.1298*** (2.81)
pop	0.3645*** (14.89)	-0.0948* (-1.90)
urb	0.5025*** (21.16)	0.0094 (0.97)
con	0.1629*** (7.84)	0.0336*** (5.53)
open	0.2198*** (9.14)	0.0981*** (5.26)
_cons	7.2734*** (140.41)	-0.0344 (-0.53)
Region fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
N	2570	2570

*Note: t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

6. Further Research

6.1. Spatial Autocorrelation Test

This paper uses the global Moran’s I index to test the spatial correlation of new quality productive forces, and the results are reported in Table 4. There is positive spatial correlation. In addition, the Moran’s I index during the sample period shows a fluctuating upward trend, indicating that the spatial agglomeration characteristics of new quality productive forces among Chinese prefecture-level cities are gradually strengthening.

Table 4. Global Correlation Test Results for New Quality Productive Forces, 2015–2024

Year	Moran’s I	p-value	Gerry’s C	p-value
2015	0.131	0.000	0.878	0.000
2016	0.141	0.000	0.869	0.000
2017	0.156	0.000	0.853	0.000
2018	0.166	0.000	0.846	0.000
2019	0.164	0.000	0.850	0.000
2020	0.168	0.000	0.846	0.000
2021	0.152	0.000	0.858	0.000
2022	0.148	0.000	0.864	0.000
2023	0.154	0.000	0.857	0.000
2024	0.161	0.000	0.850	0.000

6.2. Spatial Econometric Model Tests

To determine model applicability, this paper conducts LM tests, LR tests, Wald tests, and the Hausman test. The results are reported in Table 5. The spatial Durbin model with two-way fixed effects is finally selected as the regression model.

Table 5. Test Results for Spatial Econometric Models

Test	Indicator	Statistic	p-value
LM test	LM-error	130.574	0.000
	Robust LM-error	153.688	0.000
	LM-lag	42.491	0.000
	Robust LM-lag	65.605	0.000
LR test	LR-SDM/SEM	182.27	0.000
	LR-SDM/SAR	9964.29	0.000
Wald test	Wald-SDM/SEM	27.66	0.000
	Wald-SDM/SAR	26.94	0.000
Hausman test	Hausman	158.70	0.000

6.3. Regression Result Analysis

The spatial regression results are reported in Table 6. Columns (1) and (2) report the benchmark regression results. The coefficient of FinTech is significantly positive, consistent with the benchmark regression conclusion. The spatial coefficient is significantly negative, indicating that the development of FinTech produces a significant negative spatial spillover on the new quality productive forces of neighboring regions. At the prefecture-level city dimension, the total amount of financial resources, digital infrastructure, and high-end talent is relatively limited, and adjacent cities often have a high degree of homogeneity in industrial positioning. When a locality increases credit support for science and technology enterprises and optimizes industrial-chain financial services through FinTech, it attracts financial capital, technical labor, and data elements that originally belonged to neighboring regions, forming a “siphon effect.” Hypothesis 4a is verified.

Table 6. Dynamic SDM Effect Decomposition

Variables	Baseline Regression		Short-run and Long-run Effects Decomposition					
			Short Run			Long Run		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
fintech	0.3468***		0.3450***		0.1844***	0.3520***		0.4358***
	(9.63)		(9.95)		(3.86)	(10.34)		(3.63)
Wfintech		-0.1642***		-0.1606***			0.0838	
		(-2.84)		(-2.83)			(0.74)	
pop	0.2003***	-0.1925***	0.2019***	-0.1953***	0.0066	0.1886***	-0.1730**	0.0157
	(11.12)	(-4.47)	(11.65)	(-4.73)	(0.17)	(10.73)	(-2.05)	(0.17)
urb	0.3374	-0.1562***	0.3361***	-0.1504***	0.1857***	0.3440***	0.0954	0.4394***
	(15.13)	(-4.58)	(15.97)	(-4.42)	(6.21)	(15.99)	(1.23)	(5.19)
con	0.2199	-0.2319***	0.2195***	-0.2300***	-0.0104	0.2021***	-0.2264***	-0.0242
	(13.97)	(-8.17)	(14.16)	(-7.88)	(-0.39)	(13.05)	(-3.86)	(-0.38)
open	0.0422***	0.0487	0.0435***	0.0481	0.0916***	0.0561***	0.1606**	0.2166***
	(2.25)	(1.54)	(2.33)	(1.50)	(3.01)	(2.92)	(2.36)	(2.89)

*Note: t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

The spatial effects are further decomposed into short-run and long-run effects. Columns (3) to (5) report the short-run effects. The indirect effect is significantly negative, indicating that spatial competition dominates in the current period. From the perspective of China’s current urban development, in the short run, the factor reallocation brought by FinTech has a significant contest feature. Resources are not supplied infinitely; when a city quickly

agglomerates resources by introducing and implementing FinTech policies, the same type of resources available to adjacent prefecture-level cities decreases accordingly, strengthening the negative spatial influence. Columns (6) to (8) report the long-run effect decomposition. The indirect effect changes from negative to positive. Although it does not pass the conventional significance test, it already shows a positive spatial spillover. The long-run total effect coefficient is significantly positive, and its absolute value is significantly larger than that of the short-run total effect. The change of the neighboring effect from negative to positive in the long run reflects the transformation of intercity relations from “competition” to “coordination.” With the continued advancement of urban agglomeration and metropolitan area construction, administrative barriers and market segmentation between adjacent prefecture-level cities gradually weaken in the long run, and factor mobility shifts from one-way “siphoning” to two-way “radiation.” Cities with faster FinTech development will export technological capabilities and service models to surrounding areas in the long run, producing a technology spillover effect. At the same time, in the long run, adjacent prefecture-level cities can form an industrial division of labor based on their respective resource endowments and avoid homogeneous competition. Hypothesis 4b is verified.

7. Research Conclusion and Policy Recommendations

Based on panel data from 257 prefecture-level cities in China from 2015 to 2024, this paper uses a two-way fixed-effects model to systematically examine the impact of FinTech on new quality productive forces. The findings are as follows. First, FinTech has a significant positive promoting effect on new quality productive forces. Second, technological innovation and industrial structure upgrading are important transmission mechanisms between the two. Third, the impact of FinTech on new quality productive forces has significant spatial effects, manifested as a direct promoting effect on local new quality productive forces but a negative spatial spillover on neighboring regions. In terms of the decomposition of long- and short-run effects, the effect is significantly negative in the short run due to the siphon effect, while in the long run, affected by the spillover effect, the influence changes from negative to positive. Based on the above conclusions, this paper proposes the following policy recommendations at the levels of enterprises and the government.

At the enterprise level. First, real enterprises should make full use of the dividends of FinTech development, actively access online financing platforms such as digital credit and supply-chain finance, and ease capital bottlenecks in R&D investment and capacity renewal. At the same time, enterprises should strengthen internal digital capacity building, improve the digital recording of financial data and operating information, enhance information transparency, and increase financial institutions' willingness to grant credit. Second, technology-based enterprises should focus on the continuity of technological innovation and avoid short-term behavior. In the context of rapid FinTech development, enterprises should actively explore the path of integrating digital and real economies, improve total factor productivity through intelligent transformation, and effectively transform the financial support obtained through FinTech into technological breakthroughs and process improvements, thereby forming a virtuous cycle in which finance supports innovation and innovation drives development.

At the government level. Considering that FinTech may trigger a siphon effect among adjacent cities in the short run, local governments should avoid adopting race-to-the-bottom methods such as suppressing factor costs and relaxing environmental regulations in investment promotion. It is recommended that a platform for the overall allocation of financial resources and a cross-regional credit information sharing mechanism be established at the urban agglomeration level, and that supply-chain finance and industrial-chain finance be extended

upstream and downstream along regional industrial chains, so as to transform short-run competition into long-run coordination.

References

- [1] Xi, J. P. (2024). Developing new quality productive forces is an inherent requirement and important focus for promoting high-quality development. *Ningxia Journal of Agriculture and Forestry Science and Technology*, 65(11), 1–2.
- [2] Yang, J. (2026). Research on the impact of FinTech on new quality productive forces. *Academic Journal of Business & Management*, 8(1).
- [3] Wen, S. Y., Wang, C. Y., & Wu, K. (2026). Financial development and new quality productive forces: Analysis and empirical test from the perspective of Marxist financial theory. *Contemporary Economic Science*, 1–14.
- [4] Ding, N., Gu, L., & Peng, Y. (2022). Fintech, financial constraints and innovation: Evidence from China. *Journal of Corporate Finance*, 73.
- [5] Zhao, J. G., & Ma, R. (2026). The impact and mechanism of financial agglomeration and FinTech synergy on enterprise innovation resilience. *On Economic Problems*, (03), 71–79+98.
- [6] Zheng, H. Y., & Cai, J. Y. (2026). FinTech, digital technology innovation, and new quality productive forces. *Journal of Statistics and Information*, 41(5), 70–81.
- [7] An, B. W., Xu, P. Y., Lu, Y. F., & Li, C. Y. (2025). New quality productive forces promote high-quality economic development: Driving sources and regional coordination. *Journal of Industrial Technological Economics*, 44(03), 14–23.
- [8] Jiang, Y. M., Sun, X. Y., & Qiao, Z. Y. (2024). The great significance, basic framework, and realization path of developing new quality productive forces from the perspective of Chinese modernization. *Journal of Management*, 37(03), 1–15.
- [9] Liu, W. (2024). Scientifically understanding and effectively developing new quality productive forces. *Economic Research Journal*, 59(03), 4–11.
- [10] Wang, J., & Wang, R. J. (2024). New quality productive forces: Indicator construction and spatiotemporal evolution. *Journal of Xi'an University of Finance and Economics*, 37(01), 31–47.
- [11] Syverson, C. (2011). What determines productivity? *Journal of Economic Literature*, 49(2), 326–365.
- [12] Chen, Y. F., Yang, S. S., & Hu, S. H. (2025). Construction and measurement of a new quality productive forces evaluation index system: Based on the “input-process-output” perspective. *Science Research Management*, 46(02), 1–11.
- [13] Zhu, B., & Zeng, L. D. (2024). The impact and mechanism of digital finance development on regional new quality productive forces. *Finance & Economics*, (8), 16–31.
- [14] Zou, K., Liu, X., & Li, X. M. (2024). Research on the generation effect and mechanism of new quality productive forces from the development of technology finance. *Finance Economics Research*, 39(06), 3–18.
- [15] Ke, D. L., & Zhang, X. N. (2026). A political economy study of the high-level circular ecology of “technology-industry-finance”. *Contemporary Economic Research*, (01), 118–128.
- [16] Chen, M. Q., Li, B. E., & Deng, Y. F. (2026). How does the matching between “FinTech and the real economy” affect enterprises’ new quality productive forces? *Finance Economics Research*, 41(02), 48–64.
- [17] An, J. J., Zhao, X. R., & Li, B. H. (2025). The impact of technology finance on provincial financial risk: Spatial effects from the perspective of financial regulation. *Contemporary Economic Research*, (12), 102–117.
- [18] Yang, C. (2025). New quality productive forces and common prosperity: Paths enabled by digital technology. *China Soft Science*, (S1), 427–432.
- [19] Su, H. (2025). Technology finance, new quality productive forces, and innovation efficiency of high-tech industries. *Statistics & Decision*, 41(13), 30–35.

- [20] Wang, H. F., Li, H. F., & Xiang, F. Y. (2026). The impact of FinTech on the modernization of the manufacturing industry chain: From the perspective of new quality productive forces. *Finance & Theory and Practice*, 47(1), 17–24.
- [21] Deng, X. J., Xie, X. Y., & Zou, J. (2025). The mechanism and spatial effects of FinTech empowering new quality productive forces. *Southwest Finance*, (11), 94–106.
- [22] Zhang, H. F., & Li, R. X. (2023). Research on the impact of financial agglomeration on the transformation and upgrading of manufacturing in the Yangtze River Delta from the perspective of spatial effects. *Journal of Suzhou University (Philosophy and Social Sciences)*, 44(06), 26–39.
- [23] Ji, W. J., & Liu, W. H. (2026). Technology finance policy and the entry of new technology service enterprises: A study from the perspective of cultivating new quality productive forces. *Journal of Industrial Technological Economics*, 45(02), 56–66.
- [24] Ji, X. Q., Zhang, Z., Li, Z. Q., & Zhang, Y. S. (2025). Spatiotemporal evolution characteristics and driving factors of China's new quality productive forces spatial correlation network structure. *Resources Science*, 47(02), 373–388.
- [25] Wang, Y., Feng, X. G., & Zhao, C. Y. (2026). Digital finance, information asymmetry, and small and micro enterprise financing: Evidence from loan facilitation institutions. *Journal of Quantitative & Technological Economics*, 43(1), 242–264.
- [26] Zhao, S. F., Liang, W. Q., & Cui, Z. X. (2025). Digital finance and industrial structure optimization: From the perspective of regional financial industry expansion. *Macroeconomics*, (2), 57–71.
- [27] Huang, J., Xiang, Y. T., & Du, M. Z. (2026). Key digital technology innovation and the development of enterprises' new quality productive forces. *Economic Perspectives*, (6), 99–121.
- [28] Wu, J., Zhang, Y. F., Cheng, L. Y., & Wang, C. X. (2025). FinTech and enterprise total factor productivity: Dual perspectives of external and banking FinTech. *Economic Perspectives*, (9), 39–58.
- [29] Liu, X. H., & Yuan, Q. J. (2025). The effect path of FinTech empowering the green transformation of manufacturing enterprises. *Journal of Statistics and Information*, 40(7), 58–73.
- [30] Wang, W., & Sun, Y. X. (2025). Intelligent manufacturing and new quality productive forces: From the perspective of total factor productivity of strategic emerging industries and future industries. *Contemporary Economic Science*, 47(05), 34–51.
- [31] Gao, L. T., Meng, F., & Tian, Q. B. (2024). The impact and spatial effects of digital finance on enterprise technological innovation. *Science Research Management*, 45(6), 72–82.
- [32] He, X. Q., & Liu, L. L. (2026). The impact of urban digital inclusive finance on entrepreneurial activity and its spatial effects. *Economic Geography*, 46(3), 78–86.
- [33] Zhang, G. J., Liang, Z. Y., & Wu, Z. S. (2024). Evolution characteristics of digital inclusive finance in Chinese urban agglomerations and its effects on high-quality development. *Geographical Research*, 43(3), 621–639.
- [34] Sun, L., & Zhang, J. (2025). Can coordinated development of two-way FDI boost new quality productive forces? An empirical test based on spatial econometrics and panel threshold models. *Journal of International Economic Cooperation*, 41(2), 62–75+91–92.
- [35] Jiang, T. (2022). Mediating effects and moderating effects in causal inference empirical research. *China Industrial Economics*, (5), 100–120.
- [36] Shao, S., Li, X., Cao, J. H., & Yang, L. L. (2016). Economic policy choices for haze pollution control in China: From the perspective of spatial spillover effects. *Economic Research Journal*, 51(9), 73–88.
- [37] Han, W. L., Zhang, R. S., & Zhao, F. (2024). Measurement of new quality productive forces and new drivers of China's economic growth. *Journal of Quantitative & Technological Economics*, 41(06), 5–25.
- [38] Shen, Y., & Guo, P. (2015). Internet finance, technology spillover, and commercial banks' total factor productivity. *Journal of Financial Research*, (03), 160–175.
- [39] Sheng, T. X., & Fan, C. L. (2020). FinTech, optimal banking market structure, and credit supply to small and micro enterprises. *Journal of Financial Research*, (06), 114–132.

- [40] Liu, J. H., Yang, M. J., & Chen, S. S. (2026). Research on the impact of technology finance system innovation on key digital technology innovation: Evidence from “technology branches”. *Journal of Finance and Economics*, 52(3), 34–48.
- [41] Gan, C. H., Zheng, R. G., & Yu, D. F. (2011). The impact of China’s industrial structure change on economic growth and fluctuation. *Economic Research Journal*, 46(5), 4–16+31.
- [42] Zhao, T., Zhang, Z., & Liang, S. K. (2020). Digital economy, entrepreneurial activity, and high-quality development: Empirical evidence from Chinese cities. *Management World*, 36(10), 65–76.
- [43] Song, Z., Yu, X., Zou, H., & He, Y. (2026). Research on the extensive margin and intensive margin of household consumption in structural transformation: From the perspective of demand scale based on market accessibility. *Management World*, 42(8), 19–37.