

Research on the Impact of Digitalization on the Financialization of the Real Economy from the Perspective of Digital China

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ABSTRACT

The digital economy serves as a new engine for the endogenous development of China's economy, and its rapid growth will have a significant impact on enterprise financialization. This paper is based on the data of Shanghai and Shenzhen A-share listed companies from 2016 to 2021 and uses the fixed - effects model to explore the impact of the digital economy on enterprise financialization and its mechanism. The empirical results show that the digital economy promotes the deepening of enterprise financialization, and this result remains valid after robustness tests such as indicator replacement and the instrumental variable method. The digital economy increases the degree of enterprise financialization by exacerbating enterprise cash - flow pressure and reducing financing constraints. Further investigation of the impact path between them reveals that there are regional and enterprise - scale heterogeneities in the impact of the digital economy on enterprise financialization. This paper enriches the research on the digital economy and the financialization of the real economy of enterprises and provides a theoretical basis and policy reference for the digital economy to serve the real economy.

KEYWORDS

Digital economy; Enterprise financialization; Cash flow; Regional heterogeneity; Enterprise - scale heterogeneity

1. INTRODUCTION

The digital economy, as the most dynamic sector in China's economic development, plays an indispensable role in the rapid and high - quality development of China's economy. According to data released by the Cyberspace Administration of China, in 2023, the added value of China's core digital economy industries exceeded 12 trillion yuan, accounting for about 10% of GDP [28]. The 2024 Government Work Report listed "vigorously promoting the construction of a modern industrial system and accelerating the development of new - quality productive forces" as the top task of the government's work for that year, emphasizing the need to "deeply promote the innovative development of the digital economy" [29]. In 2025, the "Global Digital Economy Development Research Report (2024)" released by the China Academy of Information and Communications Technology pointed out that major countries around the world are showing a trend of digital capital intensification. Digital capital has become a key force driving economic growth in major digital - power countries. Focusing on major countries with a high proportion and large increment in the global digital economy, from 2014 to 2023, the growth rate of China's GDP derived from digital capital was 0.71%, significantly higher than that of the United States, Japan, Germany and other countries [30]. It can be seen that digital capital has significantly promoted China's economic development. Currently, the digital economy has become a new driving force for the high - quality development of China's economy.

Enterprises, as the micro - components of China's macro - economy, their digitalization has gradually become an important force promoting the transformation of the macro - digital economy, playing multiple roles such as facilitating industrial optimization and upgrading and achieving high - quality economic development. However, affected by multiple factors such as the pandemic, geopolitical issues, and economic downturn, real - economy enterprises face problems such as low profit margins, long investment payback periods, and high technical thresholds during the transformation and upgrading process. At the micro - level, in pursuit of maximum profits, enterprises often choose financial investment with a higher rate of return over real - economy investment. The proportion of financial asset investment in the investment structure is constantly increasing, which may lead to financial assets "crowding out" or even "substituting" fixed - asset investment, mispricing of risk and return of financial assets, and suppressing real - economy investment. At the macro - level, the higher the degree of enterprise financialization, the stronger its financing ability, and the weaker the promoting effect of monetary policy on real - economy investment [1]. This will result in problems such as the circulation of funds in the financial sector, an increase in the operating risks of the national economy, an imbalance in the employment structure, a low - end industrial structure, and an increased locking - in risk. Therefore, an increase in financial investment at the micro - level by enterprises deepens the degree of financialization, affecting real - economy investment, and thus weakening the implementation effect of monetary policy at the macro - level, having a negative impact on employment, industry, and the operation of the national economy [2]. That is, the financialization of micro - enterprises ultimately affects the normal operation of the macro - economy through specific transmission paths.

2. LITERATURE REVIEW

2.1. The Development of the Digital Economy

The concept of the digital economy was first proposed by American economist Don Tapscott, who believed that "digitized knowledge and information" has value. Most scholars at home and abroad focus their research on the digital economy on its role and impact mechanism on the social economy and enterprise production, especially on the paths to high - quality economic development. In terms of economic development quality, at the macro - level, the digital economy can drive the high - quality development of the manufacturing industry by expanding human capital accumulation and stimulating entrepreneurial vitality (Hui Ning et al., 2022), promote the improvement of resource allocation efficiency by substituting other capitals, bring about an increase in production efficiency through the coordination of other production factors, help the government establish a macro - economic decision - making system, and provide a supporting policy system for the digital economy to empower high - quality economic development (Ren Baoping, 2022). It can also indirectly drive high - quality development by boosting consumption levels and promoting the improvement of production efficiency in the secondary and tertiary industries (Yang Wenpu, 2022). At the micro - level, the digital economy uses emerging technologies such as the Internet and mobile communication to form an economic environment with both economies of scale and scope, matching supply and demand and improving the price mechanism, and enhancing the equilibrium level of the economy (Jing Wenjun et al., 2019). It can also improve the input - output situation of enterprise innovation by alleviating information asymmetry, enhancing market investors' expectations, and is conducive to enhancing the independent innovation ability and R & D efficiency of enterprises, accelerating enterprise innovation (Yan Yujun, 2023). In terms of the measurement of the digital economy, the measurement methods mainly include the digital economy added - value method, the digital economy index method, and the digital satellite account method [3]. The digital economy added - value is mainly measured by the contribution of the digital economy to GDP to measure the scale of economic development [4]. It can combine the growth accounting and the conventional GDP accounting method, or it can separately calculate the production and application of digital technology [5]. The digital

economy index method is to establish multi - dimensional indicators and assign weights to relevant indicators through subjective or objective weighting methods. On the one hand, scholars incorporate the development of the Internet into the indicator system to construct a digital economy evaluation system [6-8]. On the other hand, based on the input - output perspective, scholars refine dimensions such as digital input and digital output and conduct analysis from the perspective of spatial heterogeneity [9-11]. The digital satellite account can reflect the situation of various industries in the national economy engaged in digital - economy - characteristic activities. Relevant international organizations, some national government statistical agencies, and relevant scholars have mainly carried out research on constructing ICT satellite accounts and digital economy satellite accounts [12].

2.2. Research on the Financialization of Real - Economy Enterprises

Against the background of a downturn in the real economy and a low investment return rate, enterprises tend to allocate more assets to investment rather than traditional production and operation activities to obtain more profits, which restricts the long - term sustainable development of other production and operation departments within real - economy enterprises. Scholars' research on enterprise financialization mainly focuses on three aspects: the motivation, influencing factors, and negative impacts of enterprise financialization. In terms of the motivation of enterprise financialization, scholars mainly study the savings motivation and the speculative motivation. The savings motivation means that when enterprises face future economic risks, they hold a part of liquid assets in normal times to better invest in the real economy. The speculative motivation is that factors such as the "investment substitution" effect of financial assets, discrimination in the financing market, and the performance pressure of managers give rise to the speculative motivation of enterprises, which has a "crowding - out" effect on the development of the main business of enterprises [13]. In terms of the influencing factors of enterprise financialization, at the national level, economic policy uncertainty [14] and the relaxation of the lower limit of loan interest rate control [15] both inhibit the degree of enterprise financialization, but the impact of these two factors is significant in more competitive enterprises and enterprises with less profit - competition pressure respectively. At the enterprise level, corporate social responsibility exacerbates enterprise financialization [16] by alleviating financing constraints, and the operating profit [17] and ownership concentration of enterprises are negatively correlated with the degree of enterprise financialization [18]. In terms of the impact of financial risks, enterprise financialization will lead to an increase in the risk of stock price crashes [19], especially in enterprises with higher operating risks and lower internal supervision levels. It will reduce the total factor productivity of operating businesses and the core competitiveness of operating businesses [20]. Although it helps to improve enterprise operating performance in the short term, it will inhibit enterprise innovation motivation in the long term, and this impact is regulated by the enterprise life cycle [21]. At the macro - level, it will lead to the mispricing of risk and return of financial assets, suppress real - economy investment, and thus hinder the macro [22] - economic strategy. It will also weaken the boosting effect of monetary policy on the real economy [23].

2.3. Literature Review

Regarding the impact of digitalization on enterprise financialization, some scholars have constructed regression models to study the direct impact of digitalization on enterprise financialization and further explored the specific impact mechanism by introducing mediating variables such as free cash flow, financing efficiency [23], financing constraint degree, and enterprise internal control quality. Other scholars have explored the specific impact paths from different channels, such as the competition pattern channel, the production method channel, the organization and management channel, and the financial management channel [24]. Some scholars have introduced other variables to further analyze the differences and effects of the impact, such as enterprise heterogeneity, property - rights heterogeneity, policy - support heterogeneity, regional heterogeneity [25], and local government

behavior [26]. In addition to the direct impact path, digitalization still has a certain impact on the macro - and micro - levels by suppressing financialization. For example, by suppressing enterprise financialization, promoting the development of the main business, and upgrading the structure, digitalization of enterprises can stimulate the expansion of labor demand and enhance the wage - bargaining power, thus further increasing the labor income share [27].

In summary, existing research in the field of the digital economy is quite rich in macro - aspects such as policy support and high - quality economic development, as well as in specific measurement methods. However, the research perspective at the micro - level is relatively single, mainly focusing on the promotion of the digital economy on technological progress and enterprise innovation. Scholars' research on enterprise financialization mainly includes the motivation of enterprise financialization, its influencing factors, and its macro - and micro - negative impacts, with less exploration of the impact of the external environment. Regarding the impact path of the digital economy on it, most scholars mainly explore the inhibitory effect of the digital economy on enterprise financialization, and few scholars explore the positive impact path and mechanism of the digital economy on it. Further exploration of heterogeneity is limited to the differences in the inhibitory effect. Therefore, the innovation points of this paper are as follows: (1) Based on the macro - background of "Digital China" construction, this paper analyzes the background of the integration of the digital and the real from the national - strategic level and conducts a specific path analysis from the micro - enterprise level, enriching the existing research on the linkage between the macro and the micro. (2) Starting from the external - environment factor of the digital economy, different from the current discussion on the negative relationship between the two, this paper mainly explores the positive impact mechanism of the digital economy on enterprise financialization, filling the gap in the single - dimensionality of the current research on the impact path and mechanism of the digital economy on enterprise financialization. (3) Under the influence mechanism of the promoting effect, this paper further conducts in - depth analysis from two dimensions: regional heterogeneity and enterprise - scale heterogeneity, revealing the differential characteristics of the impact of the digital economy on enterprise financialization. At the same time, specific suggestions are given for different differences, improving the generalization problem existing in the policy - recommendation level of existing research.

3. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESES

According to the investment substitution theory, when enterprises make investments, in order to maximize their interests, they often allocate funds to economic fields with lower costs and higher yields by weighing the risk levels and expected rates of return of different investment projects. In recent years, driven by new - generation information technologies such as cloud computing and blockchain, the digital economy has developed rapidly, and service and high - tech enterprises have emerged rapidly. Market competition has further intensified, leading to a significant increase in enterprises' demand for working capital. At the same time, the external environment such as policy updates and technological iterations has further aggravated the operating risks and financial pressures of traditional real - economy enterprises. To alleviate cash - flow shortages and enhance risk - resistance capabilities, real - economy enterprises tend to sell financial assets with lower transaction costs and higher value stability to obtain liquidity. This behavior not only directly improves the liquidity of financial assets but also promotes an increase in the proportion of enterprise financialization. On the other hand, the digital economy can ease enterprises' financing constraints. Traditional enterprises can use digital technologies such as artificial intelligence and blockchain to increase the innovation and development of financial service products, enhance their financing capabilities. At the same time, the new business models emerging in the context of the digital economy can also improve the efficiency of enterprise financial services and reduce enterprise financing constraints. Under this premise, according to the "investment substitution theory", enterprises tend to choose to invest their relatively abundant funds in financial assets with faster

returns, further promoting enterprise financialization. Therefore, the following hypothesis is proposed in this paper:

H1: The development of the digital economy can promote enterprise financialization.

Based on the regional economic theory, different regions vary in geographical location, resource endowment, and economic development level, which may lead to different degrees of influence of a certain factor in different regions. In China, the eastern region has a high level of economic development, relatively complete digital infrastructure construction, great market competition pressure, and stronger demand for liquid financial assets by enterprises. At the same time, enterprises in this region have stronger financial and technological capabilities to carry out more efficient financial services and financial asset investments. The promoting effect of the digital economy on enterprise financialization may be stronger. In contrast, in the western region, due to its relatively backward economy, the development of science and technology and talent is relatively sluggish, and a relatively mature financial market has not yet been formed. Enterprises have fewer opportunities to participate in financial asset investments due to financial and technological problems when their own development is relatively slow, and the degree of enterprise financialization is relatively low. The promoting effect of the digital economy on enterprise financialization may be weaker. Therefore, the following hypothesis is proposed in this paper:

H2: There is regional heterogeneity in the impact of the digital economy on enterprise financialization.

According to the enterprise - scale economy theory, the larger the enterprise scale, the lower the cost of its production and operation activities, and the higher the resource - allocation efficiency. Large - scale enterprises with more funds, technology, and talent have more resources to use digital technologies such as big data to optimize their investment decisions, establish a complete risk - prevention mechanism, and use diversified investment portfolios to reduce risks in financial investments, thus increasing investments in more liquid financial assets. The impact of the digital economy on enterprise financialization is stronger. On the contrary, due to scale and financial limitations, small and medium - sized enterprises find it difficult to afford and fully utilize the technologies brought about by the development of the digital economy. As a result, their risk - resistance and investment capabilities in the financial market are weak, the degree of enterprise financialization is low, and the impact of the digital economy on enterprise financialization is weak. Therefore, the following hypothesis is proposed in this paper:

H3: There is enterprise - scale heterogeneity in the impact of the digital economy on enterprise financialization.

4. DATA PROCESSING AND DESCRIPTIVE STATISTICS

4.1. Data Sources and Processing

This paper selects the annual data of Shanghai and Shenzhen A - share listed companies from 2016 to 2021 as the research sample. The enterprise - characteristic data of listed companies are sourced from the CSMAR database, and other data are from the China Statistical Yearbook. To ensure the reliability of the regression results, the sample data are processed as follows: (1) Exclude financial - type listed companies and ST companies; (2) Delete enterprise samples in a bankrupt state; (3) Remove extreme values; (4) Winsorize continuous variables at the 1% level at both ends.

4.2. Selection and Construction of Main Indicators

Core explanatory variable: Referring to the research of Liu Jun et al. (2020) and Jiang Wei et al. (2021), this paper selects appropriate indicators from the two dimensions of Internet development and informatization development to measure the digital economy. The main measurement indicators

include Internet penetration rate, the number of Internet access ports, the length of long - distance optical cable lines, the number of IPv4 addresses, and the number of domain names per 10,000 people. The data of the above five indicators are standardized, and the comprehensive development index of the digital economy is obtained by using the principal component analysis method.

Explained variable: According to existing research, there are two main methods to measure the degree of enterprise financialization: the financial - asset - to - total - asset ratio method and the financial - channel - income - to - total - income ratio method. Considering the uncertainty of financial income and the direct reflection of the financial - asset - to - total - asset ratio on investment, this paper draws on the research of Demir (2009) and uses the proportion of financial assets in total assets to measure the degree of enterprise financialization. At the same time, with the rapid development of the real - estate industry, the financial - asset characteristics of investment real estate have become more prominent, so investment real estate is also included in financial assets. Therefore, financial assets include monetary funds, trading - financial assets, available - for - sale financial assets, held - to - maturity investments, long - term equity investments, dividend receivables, interest receivables, and investment real estate.

Control variables: To minimize the impact of other factors on the research results, this paper selects control variables by referring to relevant literature (Yan Wu and Wan Liangwei, 2022; Yang Mingyan and Pu Zhengning, 2022). The main control variables include enterprise size (Size), return on equity (ROE), enterprise growth (Growth), duality (Dual), Tobin's Q (TobinQ), and enterprise listing age (ListAge).

Table 1. Specific Definitions of Main Variables

Variable Type	Variable Name	Variable Symbol	Variable Definition
Explained variable	Digital Economy Development Index	DEI	Principal Component Analysis Method
Explanatory variable	Degree of Enterprise Financialization	fin	Proportion of Financial Assets in Total Assets
Control variables	Enterprise Size	Size	Natural Logarithm
	Return on Equity	ROE	Measured by the ratio of the enterprise's net profit to the average balance of shareholders' equity
	Enterprise Growth	Growth	The growth rate of operating revenue
	Duality	Dual	If the chairman of the board also serves as the general manager, assign a value of 1; otherwise, assign a value of 0.
	Tobin's Q Ratio	TobinQ	The ratio of the company's market value to its total assets
	Enterprise Listing Age	ListAge	The number of years since the enterprise went public

4.3. Descriptive Statistics

The descriptive statistics of each variable in this paper are shown in Table 2. The mean and standard deviation of enterprise financialization (fin) are 0.052 and 0.09 respectively, with a minimum value of 0 and a maximum value of 0.867. This indicates that the overall level of enterprise financialization is relatively low, but there are significant individual differences, and there may be a polarization phenomenon among different enterprises. The mean and standard deviation of the digital economy development index (DEI) are 0.359 and 0.173 respectively, with a minimum value of 0.098 and a maximum value of 0.954. This shows that the overall level of digital economy development is medium, and there are large differences in the degree of digital transformation among different

companies. From the data of enterprise size (Size), enterprise listing age (ListAge), and duality (Dual), it can be seen that the differences in enterprise scales are small and relatively concentrated. Most enterprises are relatively young listed companies, with relatively short listing ages and no centralized arrangement of the dual positions of chairman and CEO. From the data of return on equity (ROE), enterprise growth (Growth), and Tobin's Q (TobinQ), it can be seen that there are large differences in profitability, growth rate, and market valuation among different enterprises. Some enterprises may face serious financial difficulties, and there may also be behaviors of over - or under - valuation in the market.

Table 2. Descriptive Statistics of Relevant Variables

Variable	Sample Size	Mean	Standard Deviation	Minimum Value	Maximum Value
fin	13946	0.052	0.09	0	0.867
DEI	13946	0.359	0.173	0.098	0.954
Size	13946	22.582	1.308	19.735	26.43
ROE	13946	0.057	0.15	-1.072	0.406
Growth	13946	0.169	0.411	-0.66	4.31
Dual	13946	0.261	0.439	0	1
TobinQ	13946	1.913	1.313	0.802	11.461
ListAge	13946	2.383	0.76	0.693	3.367

5. ECONOMETRIC MODELS AND ESTIMATION METHODS

5.1. Benchmark Model

To verify the impact of digitalization on enterprise financialization, the following model is constructed in this paper:

$$fin_{i,t} = \beta_0 + \beta_1 DEI_{i,t} + \sum Controls + \varepsilon \quad (1)$$

Where $fin_{i,t}$ represents the financialization degree of company i in year t , $DEI_{i,t}$ represents the digital economy development index of company i in year t , Controls represents the control variables, and ε is the random error term.

As shown in Table 3, columns (1), (2), and (3) represent the OLS regression, fixed - effects (FE) regression, and random - effects (RE) regression under the full sample respectively. Under the three regression models, the regression coefficients of the digital economy development index (DEI) are all significantly positive, indicating that the development level of the digital economy significantly promotes the degree of enterprise financialization. Specifically, the coefficient in the OLS regression is 0.0621, the coefficient in the fixed - effects regression is 0.0523, and the coefficient in the random - effects regression is 0.0304. These coefficients are all statistically significant and positively correlated with enterprise financialization. In the choice between fixed - effects and random - effects, the following considerations are made in this paper: A Hausman test is performed on the model, and the results show that the Hausman test value is greater than the critical value at the significance level (5%), rejecting the null hypothesis. Therefore, the fixed - effects model is selected as the benchmark model for estimation.

Table 3. Regression Results of the Digital Economy on Enterprise Financialization

Variable	(1) OLS	(2) Fixed Effects	(3) Random Effects
DEI	0.0621(14.02)***	0.0523(13.72)***	0.0304(7.10)***
Size	-0.00625(-9.06)***	-0.00473(-4.32)***	-0.00885(-4.33)***
ROE	0.0309(5.80)***	0.00974(2.31)**	0.00810(1.85)*
Growth	-0.0103(-5.39)***	-0.00352(-2.65)***	-0.00255(-1.88)*
Dual	0.00927(5.26)***	0.00228(1.27)	-0.00273(-1.35)
TobinQ	0.00155(2.46)**	0.00502(8.39)***	0.00474(7.12)***
ListAge	0.0144(12.98)***	0.0235(14.60)***	0.0568(20.55)***
_cons	0.131(8.58)***	0.0778(3.29)***	0.0971(2.24)**
N	13946	13946	13946
R2	0.033		0.070

Note: *, **, and *** in the table represent significance at the 1%, 5% and 10% levels respectively, and the values in parentheses are standard deviations. The same below.

5.2. Multicollinearity Test

To test the multicollinearity problem in the regression model, this paper calculates the variance inflation factor (VIF) of each independent variable. According to the standard, when the VIF value of a variable is less than 10, it usually indicates that there is no serious multicollinearity. When the VIF is close to 1, it indicates that there is almost no linear relationship between variables, indicating weak multicollinearity. According to Table 4, the VIF values of all variables are far less than 10 and close to 1. It can be seen that the correlations among all variables are low, there is no serious multicollinearity, the regression results of the model are robust, and are not significantly affected by multicollinearity.

Table 4. Multicollinearity Test Results

Variable	VIF	1/VIF
Size	1.440	0.693
ListAge	1.260	0.794
TobinQ	1.220	0.818
ROE	1.130	0.889
Growth	1.090	0.919
Dual	1.060	0.940
DEI	1.040	0.965
Mean	VIF	1.180

5.3. Robustness Tests

The robustness test examines the robustness of the evaluation method and the explanatory power of the indicators, that is, when certain parameters are changed, whether the evaluation method and indicators can still maintain a relatively consistent and stable explanation of the evaluation results. First, this paper uses the indicator replacement method, that is, by replacing the control variables to examine the consistency and stability of the results. The control variables used in the original model include enterprise scale (Size), return on equity (ROE), enterprise growth (Growth), enterprise listing age (ListAge), etc. To verify that the results are not affected by the selection of control variables, some control variables are replaced as follows: Dual (duality) is replaced by ROA (return on assets) to test the impact of profitability on enterprise financialization. TobinQ is replaced by Top10 (the shareholding ratio of the top 10 major shareholders of the company) to measure the impact of the

degree of corporate control concentration on enterprise financialization. The regression results are shown in Table 5. Columns (1) and (2) show the regression results of the original model and the model after replacing the control variables respectively. By comparing the regression coefficients of the two models, it can be found that the coefficients of DEI (Digital Economy Development Index) are positive in both models and statistically significant at $p < 0.01$, indicating that the positive impact of the digital economy on enterprise financialization remains consistent under different control variables. The coefficients of Size, ROE, Growth, and ListAge change little in significance and sign in the two models. Therefore, it can be concluded that the regression model of this paper is still robust after replacing the control variables.

Table 5. Robustness Test: Regression Results of Replacing Control Variables

Variable	(1) Original Model	(2) Replaced Control Variables
DEI	0.0249(5.90)***	0.0249(5.90)***
Size	-0.0103(-4.98)***	-0.0103(-4.98)***
ROE	0.00255(0.27)	0.00255(0.27)
Growth	-0.00264(-1.93)*	-0.00264(-1.93)*
ROA	0.0251(1.11)	0.0251(1.11)
Top10	-0.0175(-1.57)	-0.0175(-1.57)
ListAge	0.0590(19.65)***	0.0590(19.65)***
_cons	0.145(3.39)***	0.145(3.39)***
N	13946	13946
R2	0.065	0.065

Secondly, to verify whether the impact of the digital economy on enterprise financialization is consistent in different industries, this paper uses the sub - sample regression method. By dividing the sample into different industry categories and selecting the manufacturing industry, which is an important pillar industry for the development of the national real economy, for regression analysis. On the basis of generating new variables for industry classification and creating annual dummy variables to eliminate the impact of year effects, the results shown in Table 6 are obtained. The regression coefficient of the digital economy development index (DEI) is 0.0375 and is significant at the 1% significance level, indicating that the digital economy significantly promotes the financialization of manufacturing enterprises, and this conclusion can support the results of the benchmark regression.

Table 6. Robustness Test: Regression Results of Sub - sample Test

Variable	Manufacturing Industry
DEI	0.0375(7.11)***
Size	-0.00524(-1.99)**
ROE	0.0194(3.41)***
Growth	-0.00457(-2.31)**
Dual	-0.00259(-1.06)
TobinQ	0.00357(4.82)***
ListAge	0.0563(17.38)***
_cons	0.0133(0.24)
N	9033
R2	0.088

5.4. Endogeneity Tests

(1) Endogeneity of omitted variables: Panel fixed - effects model

In regression analysis, endogeneity problems are usually caused by issues such as omitted variables, simultaneity, and measurement errors, resulting in biases in the estimation results. To address the endogeneity problem caused by omitted variables, this paper uses the panel data fixed - effects model. By eliminating the time - invariant characteristics of each individual, it solves the endogeneity problem caused by the unobserved heterogeneity among individuals, thereby improving the accuracy of the estimation results. The introduction of control variables can further reduce the impact of potential endogeneity. Based on this, this paper selects six control variables, including enterprise scale (Size), return on equity (ROE), enterprise growth (Growth), duality (Dual), Tobin's Q (TobinQ), and enterprise listing age (ListAge). According to column (1) of Table 7, the correlation coefficients of enterprise scale and enterprise growth are - 0.00885 and - 0.00255 respectively, indicating a negative correlation with enterprise financialization. That is, large - scale enterprises with high growth potential and strong financing capabilities tend to use internal resources and funds for business expansion and market development rather than relying on the capital market for financing, and their degree of financialization is relatively low. The coefficients of Tobin's Q and enterprise listing age are 0.00474 and 0.0568 respectively, indicating that enterprises with longer listing years are experienced in the capital market, have stronger adaptability and competitiveness in the capital market, and are more proficient in relying on the capital market for financing, with a higher degree of financialization.

(2) Endogeneity of two - way causality: Instrumental variable method (IV)

This paper refers to the method of Sun Churen (2015) and uses the one - period lag of the core explanatory variable of the digital economy as its instrumental variable to test the model results, as shown in Table 7. Comparing the estimation results of the fixed - effects model in column (1) and the instrumental variable regression in column (2), the regression coefficients of the digital economy are 0.0304 and 0.249 in the two models respectively. Although the coefficient sizes are different, both are significant at the 1% significance level, indicating that although the model settings are different, the impact of the digital economy on enterprise financialization remains consistent, which can prove the reliability of the regression results. In addition, the coefficients of other control variables show a relatively consistent trend in the two models, further supporting the robustness of the model.

Table 7. Regression Results of the Digital Economy and Enterprise Financialization

Variable	(1) Fixed - Effects Model	(2) Instrumental Variable Regression
DEI	0.0304(7.10)***	0.249(18.92)***
Size	-0.00885(-4.33)***	-0.00673(-5.41)***
ROE	0.00810(1.85)*	0.00828(1.58)
Growth	-0.00255(-1.88)*	0.0150(6.64)***
Dual	-0.00273(-1.35)	0.00367(1.62)
TobinQ	0.00474(7.12)***	0.00699(8.45)***
ListAge	0.0568(20.55)***	0.0189(8.75)***
_cons	0.0971(2.24)**	0.0489(1.83)*
N	13946	10753
R2	0.070	

6. EMPIRICAL ANALYSIS RESULTS

This paper uses the fixed - effects model for regression analysis. In column (2) of Table 3, the correlation coefficient between the digital economy development index and enterprise financialization is 0.0523, which is significant at the 1% level. This indicates that the development of

the digital economy can significantly increase the degree of enterprise financialization. That is, for every 1 - standard - deviation increase in the digital economy, enterprise financialization will increase by 10.05% of a standard deviation. The development of the digital economy intensifies market competition, which may cause enterprises to face problems such as insufficient cash flow, increasing the demand for liquid financial assets and raising the proportion of enterprise financialization. At the same time, the technological progress brought about by the digital economy enhances the efficiency and competitiveness of enterprises in providing financial services, promoting enterprises to increase investments in high - return financial assets, thus verifying Hypothesis H1. Among the control variables, the coefficients of enterprise scale (Size) and enterprise growth (Growth) are - 0.00473 and - 0.00352 respectively, and both are significant at the 1% statistical level. This shows that large - scale enterprises with high growth potential pay more attention to their own investment and the rational use of internal resources and rely less on financial instruments. The coefficients of Tobin's Q (TobinQ) and enterprise listing age (ListAge) are 0.00502 and 0.0235 respectively, and both are significant at the 1% level. This indicates that when the market has a high perception of a company's value, the enterprise tends to increase financialization activities for better investment or financing. The longer an enterprise has been listed, the higher its reputation and loyalty, and the easier it is to obtain funds for financial asset investment.

7. ANALYSIS OF THE IMPACT MECHANISM

7.1. Impact Mechanism Based on Regional Heterogeneity

In China, the development levels of the digital economy vary in different regions, and listed enterprises also have significant differences in scale, market share, and profitability. This may lead to different degrees of impact of the digital economy on enterprise financialization in different regions. Therefore, this paper divides the samples into the eastern, central, and western regions according to regional characteristics and conducts group regression analysis. The results are shown in Table 8. From columns (1) to (3), the regression coefficients of the digital economy development index (DEI) on enterprise financialization in the eastern and central regions are 0.0324 and 0.0443 respectively, both of which are significantly positive at the 1% level, and the regression coefficient in the central region is higher than that in the eastern region. However, the regression coefficient of the digital economy development index (DEI) on enterprise financialization in the western region is 0.0128, which is positive but has a low significance level. This indicates that the promoting effect of digitalization on enterprise financialization in the three regions is in the order of central > eastern > western. Specifically, in the eastern region, the economic development level is high, and enterprises generally have a strong digital foundation. The high - level digitalization improves the efficiency of information transmission and the speed of technological innovation, further accelerating the innovation of financial instruments and capital, and thus accelerating the process of enterprise financialization. The stronger promoting effect of the digital economy on enterprise financialization in the central region may be because the central region is undergoing economic restructuring, and the development of the digital economy has become a key means to enhance the competitiveness of small and medium - sized enterprises and promote economic transformation. Their close participation in the capital market provides a way to accelerate enterprise financialization. In the western region, the development of the digital economy is restricted by many factors, including backward infrastructure, tight enterprise financing channels, and limited talent. Therefore, it is difficult for enterprises to connect with the capital market through digitalization, resulting in a low demand for financial assets. At the same time, the level of financialization services is low, and financing is difficult.

Table 8. Regional Heterogeneity

Variable	(1) Eastern Region	(2) Central Region	(3) Western Region
DEI	0.0324(6.23)***	0.0443(3.93)***	0.0128(1.15)
Size	-0.0130(-4.92)***	0.00584(1.44)	-0.00842(-1.61)
ROE	0.00942(1.68)*	0.00277(0.32)	0.0000482(0.00)
Growth	-0.00222(-1.23)	-0.000915(-0.37)	-0.00408(-1.24)
Dual	-0.000768(-0.31)	0.000175(0.04)	-0.0250(-4.28)***
TobinQ	0.00475(5.44)***	0.00650(4.85)***	0.00459(3.11)***
ListAge	0.0606(18.08)***	0.0472(7.02)***	0.0535(6.45)***
_cons	0.189(3.37)***	-0.240(-2.80)***	0.0841(0.76)
N	9900	2300	1521
R2	0.072	0.088	0.070

7.2. Impact Mechanism Based on Scale Heterogeneity

To explore whether there is heterogeneity in the impact of the digital economy on enterprise financialization in terms of enterprise scale, this paper divides the samples according to enterprise scale and conducts regression analysis at different quantiles. The results are shown in Table 9. In the small - scale enterprise group in column (1), the impact of the digital economy development index (DEI) on enterprise financialization (fin) is significantly positive at the 1% level. Small - scale enterprises usually face problems such as information asymmetry and difficult financing. The development of the digital economy can improve the transparency of information disclosure, reduce the difficulty of obtaining external funds, and enhance the enterprise's financial forecasting and risk - control capabilities, thereby increasing the level of financial asset investment and market capitalization. In the medium - scale enterprise group in column (2), although the coefficient of the digital economy development index (DEI) is still positive, its statistical significance is slightly lower than that of small - scale enterprises. This may be because medium - scale enterprises already have a relatively strong financial foundation and more mature market resources compared to small - scale enterprises, and their financing channels and internal governance systems are also relatively complete. The marginal effects of the improvements in information transparency and financing efficiency brought about by the development of the digital economy are relatively limited. In column (3), for large - scale enterprises, the coefficient of the digital economy does not reach statistical significance. Large - scale enterprises usually have more capital, technology, and management resources. At the same time, these enterprises may already have a high level of informatization and financialization, a high degree of participation in the financial market, and a large proportion of financial asset investment. Further digital transformation has a relatively limited promoting effect on their financialization process.

Table 9. Scale Heterogeneity

	(1) Small - scale	(2) Medium - scale	(3) Large - scale
DEI	0.0607(6.11)***	0.0430(5.67)***	0.00501(0.98)
Size	-0.0139(-2.01)**	-0.00541(-0.92)	-0.00568(-1.86)*
ROE	0.00801(0.85)	0.00871(1.16)	0.00175(0.29)
Growth	0.00478(1.43)	-0.00251(-1.00)	-0.00328(-2.15)**
Dual	-0.00951(-2.22)**	-0.0000386(-0.01)	-0.000971(-0.36)
TobinQ	0.00429(3.69)***	0.0107(7.23)***	0.00862(6.26)***
ListAge	0.0590(11.26)***	0.0515(8.92)***	0.0403(7.28)***
_cons	0.203(1.43)	0.0154(0.12)	0.0602(0.90)
N	4649	4649	4648
R2	0.086	0.076	0.036

8. CONCLUSIONS AND POLICY RECOMMENDATIONS

8.1. Deepen the Integrated Development of the Digital Economy and the Real Economy

In line with the development trend of the digital economy, the government should actively guide real - economy enterprises to carry out digital transformation. First, with real - economy enterprises as the core, rationally and orderly formulate industry - specific digital transformation roadmaps, and actively promote different types of digital economy cooperation, such as the construction of digital operator service platforms and data - sharing resource libraries in multiple fields of various industries. Through cross - industry cooperation between the digital and the real, strengthen information exchanges among different industries and achieve the maximization of the interests of both sides and multiple parties. Second, appropriately provide resources and financial support for the development of the digital economy, lower the threshold for enterprises to introduce the digital economy, expand the diversification of the main bodies applying digital technologies, and enhance the competitiveness and sustainability of the development of the digital industry. Third, improve the mechanism for introducing and cultivating digital talents. Introduce high - end digital - economy talents at home and abroad, provide them with preferential treatment and guarantees in housing, medical care, and other aspects, and facilitate their digital research and innovation in economically developed regions. Cultivate talents with digital literacy. The government, enterprises, and schools should work together to form a digital - talent training mechanism, strengthen the training of digital theories and skills, and focus on cultivating "digital +" compound talents.

8.2. Implement Region - Differentiated Policies

The state should coordinate the development of the digital economy in different regions and formulate region - differentiated policies. In the eastern region, pay attention to coordinating the development of financialization and the main business. Introduce corresponding policies to clarify that while enterprises conduct capital operations and financialization, they should attach importance to achieving the goals of the main business, and establish a corresponding supervision mechanism to prevent excessive resources from flowing into the financialization field and squeezing the resources of the real economy. In the central region, provide support for the digitalization of small and medium - sized enterprises. Through multi - faceted support in terms of funds and technology, improve their participation in the digital economy. By simplifying the procedures for small and medium - sized enterprises to enter the capital market and lowering the financing threshold, reduce their difficulty in raising funds and further promote the improvement of their financialization level. In the western region, strengthen the construction of digital infrastructure, such as 5G and cloud - computing platforms, build a digital - economy cooperation platform facing the western region, promote resource sharing and technology cooperation between eastern and western enterprises. At the same time, formulate preferential policies, reduce the costs of enterprises' Internet access and data services, and provide financial subsidies, tax preferences, and other support.

8.3. Provide Classified Guidance for Enterprises with Different Scales

When formulating policies, fully consider the characteristics of enterprise scales and adopt a strategy of classified guidance. For small - scale enterprises, promote the establishment of cooperative relationships between financial technology companies and them. Make full use of technologies such as big data and artificial intelligence to provide them with accurate credit assessments and financing suggestions. The government should set up special risk - compensation funds to provide guarantees for financial institutions such as banks, improving the convenience of capital circulation. For medium - scale enterprises with a relatively small marginal effect of financialization in the process of digital development, while paying attention to the promotion of the digital economy, focus on enhancing

their comprehensive competitiveness. Set up special science and technology innovation funds or tax - preference policies to encourage them to increase investment in technology research and development. Issue relevant policies to support them in participating in supply - chain financial innovation through digital technologies, optimize the capital flow between suppliers and customers, and improve the capital turnover rate. For large - scale enterprises with a high degree of informatization and financialization, guide them to use digital means to expand overseas markets. Through the establishment of transnational digital platforms, realize the digital management of the global supply chain and market. At the same time, guide enterprises to balance the operation of financial businesses and the real economy. Set an upper - limit standard for enterprise financialization, and use emerging digital technologies such as big data and cloud technology to conduct real - time monitoring and precise supervision of enterprises' financialization behaviors, such as the launch of financial products and the transactions of credit funds, reduce enterprise financial risks, and guide enterprises to increase investment in real - economy operations to avoid "de - real - economy and financialization".

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