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Research on Digital Finance and Financial Risk in the Context of High-quality Development: Evidence from Listed Real Estate Companies in China

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Abstract: The paper practically investigates relationships among digital finance, financial risks, and high-quality development of real estate companies using data from listed real estate companies and digital finance from 2011 to 2020. The research findings are as follows: (1) Digital finance significantly foster the high-quality development of real estate companies; (2) Mechanism analysis indicates that digital finance can advocate the high-quality development of real estate companies by alleviating financial risks. Therefore, this paper suggests policy recommendations such as the government issuing policies to drive the development of digital finance, companies establishing sound internal control and risk management mechanisms, and companies undergoing digital transformation to promote the high-quality development of real estate companies.

Keywords: digital finance, financial risk, total factor productivity

1. Introduction

In recent years, China's financial development and reform have been continuously advancing, and the financial market has gradually improved with an increasing variety of innovative financial products and instruments. Against this backdrop, China's overall financial scale has been expanding, and profound changes have occurred in the financial structure [1]. Financial support plays an indispensable role in the production and operation activities of real estate companies due to their need for large-scale development funds, making financing crucial for them. In recent years, emerging financial industries, represented by digital finance, have effectively supported the high-quality development of real estate companies by utilizing the advantages of digital technology to provide lower funding costs, faster transaction speeds, and more convenient service methods. Existing researches have shown that digital finance, as a new force in financial service, has significant benefits in alleviating financial mismatches, incentivizing enterprise innovation, and enhancing financing availability, further promoting enterprise progress [2]. However, along with the rapid development of digital finance, various issues such as data monopolies, regulatory arbitrage, and data misuse have emerged [3]. Consequently, there are risks associated with the application of digital finance in real estate companies, and these changes in financial risks bring uncertainties to their high-quality development. Currently, limited literature exists on the relationships among digital finance, financial

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risks, and the high-quality development of real estate companies, with most studies not specifically focusing on this sector. Therefore, this paper aims to explore the relationship and interactions among digital finance, financial risks, and the high-quality development of real estate companies, addressing the existing research gap.

2. Research Hypotheses

Real estate companies in China have long encountered challenges in obtaining significant funds and facing difficulties in financing due to the capital-intensive nature of the industry. However, the development of digital finance offers potential solutions to address these financing issues. These issues include high financing costs, limited financing methods that heavily rely on bank financing, and inadequate control over financing risks [4]. Digital finance, as an emerging financing method, presents characteristics such as low cost and low risk, making it an effective approach to resolving these challenges. The availability of adequate funding is crucial for the survival and development of real estate companies [5], as it plays a vital role in promoting their high-quality development. Therefore, the continuous development of digital finance can effectively address these funding challenges. Based on the analysis provided, the following hypothesis is proposed:

H1: The development of digital finance has a positive impact on the high-quality development of real estate companies.

The operational continuity of real estate companies is closely tied to the availability of funds. To secure funds, these companies need to make numerous investment and financing decisions, exposing them to financial risks. Additionally, the lack of knowledge in financial risk management is a common issue among management teams in many real estate companies. In response to this trend, digital finance expands the boundaries of financial services, extends the application of finance, and facilitates the development of high-precision risk control models and intelligent early warning systems. These advancements help companies accurately identify and effectively manage financial risks [6]. Consequently, digital finance reduces financial risks and promotes high-quality development in real estate companies. Based on the comprehensive analysis presented, the following hypothesis is proposed:

H2: Digital finance promotes the high-quality development of real estate companies by alleviating financial risks.

3. Study Design

Sample Selection and Data Source. The study focuses on Chinese real estate companies from 2011 to 2021. Companies with poor performance, such as ST (Special Treatment) companies, are excluded, resulting in a final sample of 1234 observations. The data on digital finance comes from the "Digital Finance Inclusive Finance Index" developed by Peking University, while other data are obtained from the CSMAR database.

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Table 1: Variable definitions.

variable type	Variable name	variable symbol	definition
explained variable	Total factor productivity	TFP	See the previous article for the algorithm
explanatory variable	Digital Finance Index	DiFin	Peking University Inclusive Inclusion General Index (2011-2020), taking the log
meta variable	financial risk	Z	See the previous article for the algorithm
controlled variable	enterprise age	Age	(Year year-establishment year + 1) Natural logarithm
	scale	Size	End-of-term total assets
	Equity concentration	Ten	The shareholding ratio of the top ten shareholders
	Two jobs in one	Dual	1 for the chairman and general manager, otherwise 0
	The proportion of independent directors	Inde	Number of independent directors / Board of Directors
	audit opinion	Aud	Take 1, otherwise, 0

Select and design variables. (1) Dependent Variable: Total Factor Productivity (TFP). Following the research method of Duan and Li [7], the variables Y, K, L, and M represent operating revenue, net fixed assets, number of employees, and the sum of raw materials and work in progress, respectively. TFP is calculated using the LP method.

(2) Independent Variable: Digital Finance Development (DiFin). The "Digital Inclusive Finance Index" developed by Peking University is used as a proxy variable to measure digital finance development. Provincial-level data is employed.

(3) Mediating Variable: Corporate Financial Risk (Z). The comprehensive Z-score proposed by Altman [8] is widely used to assess the financial condition of listed companies in emerging capital markets. The calculation model is as follows: Z = (1.2 * working capital + 1.4 * retained earnings + 3.3 * EBIT + 0.6 * market value of equity + 0.999 * sales) / total assets. A smaller Z-score indicates higher financial risk for the company.

(4) Control Variables: There are various factors influencing the total factor productivity of real estate companies. The control variables selected in this study, based on the research methods of Chen and Jiang [9] and Jiang and Jiang [10], include company age (Age), company size (Size), ownership concentration (Ten), CEO-chair duality (Dual), proportion of independent directors (Inde), and audit opinion (Aud).

Table 1 displays the aforementioned variables. To examine multicollinearity among the variables, the study calculates the variance inflation factor (VIF). The VIF values for all the main variables are below 10, indicating the absence of severe multicollinearity issues.

To test hypothesis 1, a regression model is designed to examine the relationship between the development of digital finance and the high-quality development of real estate companies.

Model Specification: Based on hypothesis 1, the model is specified as follows:

$$TFP_{it} = \alpha_0 + \alpha_1 index_{it} + \Sigma Control_{it} + \Sigma Year_{it} + \Sigma Pro + \Sigma Ind + \varepsilon_{it} \quad (1)$$

In the regression model, the variable TFP represents the total factor productivity of the company. The variable "index" denotes the digital finance index of the city where the company is located. The

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variable "Control" represents the control variables included in the model. Additionally, the variables "Year," "Pro," and "Ind" represent the year, province, and industry fixed effects, respectively. Lastly, the variable ε represents the error term in the regression equation. Here, i denotes the company, and t denotes the year.

Referring to the mediation analysis method proposed by Wen and Ye [11], the mediation mechanism models (2) and (3) are designed based on hypothesis 2:

Model Specification:

$$Z_{it} = \beta_0 + \beta_1 DiFin_{it} + \Sigma Control_{it} + \Sigma Year_{it} + \Sigma Pro + \Sigma Ind + \varepsilon_{it} \quad (2)$$

$$TFP_{it} = \gamma_0 + \gamma_1 DiFin_{it} + \gamma_3 Z_{it} + \Sigma Control_{it} + \Sigma Year_{it} + \Sigma Pro + \Sigma Ind + \varepsilon_{it} \quad (3)$$

4. Empirical Analysis

Descriptive Statistics: Table 2 presents the descriptive statistics of the variables. It can be observed that the average TFP of the companies is 9.085 with a standard deviation of 1.127. The maximum value is 13.58, and the minimum value is 5.626. The difference between the mean and the maximum/minimum values is approximately the same, indicating that the TFP of the sample companies roughly follows a normal distribution. The significant difference between the maximum and minimum values suggests noticeable variations in TFP among the companies over the sample period, which adds practical significance to the study. Additionally, the control variables selected in this study exhibit a wide range of distribution, allowing for effective control in the empirical analysis.

Empirical Regression Results Using model (1) to examine the impact of digital finance on the high-quality development of companies, the specific results are presented in Table 3. Analyzing the regression results in column (1), it is observed that the coefficient of DiFin is significantly positive. This suggests that digital finance plays a significant role in promoting the high-quality development of companies. These findings provide preliminary validation for hypothesis 1 in this study.

Table 2: Descriptive statistics of the variables.

variable	sample number	mean	variance	least value	crest value
TFP	25,466	9.085	1.127	5.626	13.58
DiFin	1234	2.318	0.278	1.210	2.662
Z	1234	2.313	7.261	-6.917	155.6
Age	1234	3.075	0.268	1.609	3.761
Size	1234	23.36	1.563	19.08	28.29
Ten	1234	58.45	15.57	15.91	90.34
Dual	1234	0.138	0.345	0	1
Inde	1234	37.80	5.793	22.22	66.67
Aud	1234	0.951	0.217	0	1

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Table 3: Basic regression.

variable	TFP
DiFin	1.165766
	0.014
Age	0.3143295
	0.601
Size	0.2131873
	0.002
Ten	-0.0221047
	0.006
Dual	-0.1334761
	0.811
Inde	0.0038213
	0.800
Aud	-0.1740304
	0.823
Cons	2.166347
	0.499

In order to test the robustness of the findings, a robustness test is conducted following the approach of Tang, Wu, and Zhu [12]. This test takes into consideration the impact of the 2015 Chinese stock market crash on listed companies and the significant economic characteristics of municipalities directly under the central government that may affect the development of digital finance. By excluding these unobservable yet potentially influential factors, separate regressions are performed. The regression results in Table 4 show that, even after excluding these factors, the coefficient of DiFin remains significantly positive. This robustness test confirms the conclusion of this study, which states that digital finance promotes the high-quality development of companies.

Table 4: Robustness test —— Eliminate abnormal data.

ZThe 2015 data were excluded		Excluding the municipality data	
variable	TFP	variable	TFP
DiFin	1.01925	DiFin	0.5639586
	0.041		0.327
controlled variable	Yes	controlled variable	Yes
constant term	2.518928	constant term	4.958251
	0.467		0.204
fixed effect	Yes	fixed effect	Yes

5. Mechanism Analysis

Table 5 displays the outcomes of the mechanism analysis, examining whether the promotion of high-quality development in real estate companies through digital finance is facilitated by mitigating financial risks. The regression results demonstrate that the coefficient of DiFin in the first column exhibits a significant positive relationship at a 5% significance level, indicating that digital finance effectively mitigates the financial risks faced by real estate companies. In the second column, both the coefficients of Z and TFP are significant, and the coefficient of DiFin demonstrates an increase

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compared to the first column. This suggests the presence of an intermediate effect of financial risk. As a result, Hypothesis 2 is supported, affirming that digital finance promotes high-quality development in companies by alleviating financial risks.

Table 5: Analysis of mediation effects —— Financial risk.

variable	Z	TFP
DiFin	0.3990386	1.165766
	0.674	0.014
Z		-0.0061902
		0.428
controlled variable	Yes	Yes
fixed effect	Yes	Yes
constant term	1.575253	9.566085
	0.808	0

6. Conclusion and Recommendations

This study aims to exam the impact of digital finance development and financial risk on the high-quality development of real estate companies from 2010 to 2023, as well as analyzing the underlying mechanism. The findings of the study are as follows: (1) Digital finance promotes the high-quality development of real estate companies. (2) The mechanism analysis reveals that digital finance can facilitate high-quality development by mitigating financial risks for companies.

Based on the aforementioned findings, the study provides the following implications:

Firstly, governments should increase their support for digital finance. The research results indicate that the policies implemented by the government effectively promote the development of digital finance.

Secondly, companies should establish sound internal control and risk management mechanisms to enhance the supervision of financial activities. They should identify, evaluate, and manage risks, promptly address issues, reduce financial risks, and safeguard the reputation and sustainable development of companies.

Thirdly, companies should undergo technological transformation. They should adapt to the development trends of the digital age, achieve high-quality development through digital transformation, leverage digital finance tools to improve operational efficiency and customer experience, reduce costs and risks, and explore new markets and business models, thereby laying the foundation for the sustainable development of companies.

However, this study has some limitations in exploring the relationship between digital finance, financial risk, and high-quality development of companies. The research focuses on real estate companies, but different real estate companies adopt various investment and financing methods, resulting in differences in financial risks they face. Further research that delves into these variations would provide more practical value in understanding the impact of digital finance on the high-quality development of real estate companies.

References

[1] *Yuan Weiwei. A Study on the Relationship between Financial Structure and Economic Growth in China based on social Financing scale [D]. Shanxi University of Finance and Economics, 2016.*

[2] *Ma Wangfeng, Cao Zhipeng, Digital finance, Green innovation and High-quality enterprise development [J]. Economics and Management Science, 2023 (03): 125-129.*

[3] *Han Mei. Analysis of the current situation of digital finance development [J]. Economic Research Guide, 2022 (11): 113-115.*

DOI: 10.54254/2754-1169/40/20231986

[4] *Luo Yonghua. analyzes the application of financial statements in the financial management of real estate companies. Enterprise reform and management, 2022 (09): 132-134.*

[5] *Shi Miyan, Meng Fanbing, an analysis of the financing problems of real estate companies in China [J]. China market, 2021 (08): 78-79.*

[6] *Liu Xinghua, Shi Hanlin, Digital Finance and Corporate Financial Risk —— Based on the Empirical Research of Shanghai-Shenzhen A-share listed companies [J]. Journal of Yangtze River University (Social Science Edition), 2023,46 (01): 103-113.*

[7] *Duan Mei, Li Zhiqiang, Economic policy uncertainty, financing constraints and total factor productivity: empirical evidence from Listed companies in China [J]. Contemporary Finance, 2019 (6): 3-12.*

[8] *Lu Dong, Chi Yi, NatChaohong Risk Management Committee reduce the risk of the company?[J]. Finance and Trade Research, 2021 (4): 83-87.*

[9] *Chen Zhongfei, Jiang Kangqi, Digital Financial Development and enterprise total factor productivity [J]. Economic Dynamics, 2021 (10): 82-89.*

[10] *Jiang Hongli, Jiang Pengcheng, digital finance can improve the total factor productivity of companies? Empirical evidence from Chinese listed companies [J]. Journal of Shanghai University of Finance and Economics, 2021 (3): 3-18.*

[11] *Wen Zhonglin, Ye Baojuan, mediation effect analysis: method and model development [J]. Advances in Psychological Science, 2014 (5): 731-745.*

[12] *Tang Song, Wu Xuchuan, Zhu Jia, Digital Finance and Enterprise Technology Innovation: Structural characteristics, mechanism identification and effect difference under financial supervision [J]. Monthly Accounting magazine, 2020 (3): 140-146.*