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Digital Inclusive Finance, Financing Constraints and Agricultural Enterprise Value

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ABSTRACT

The emergence of digital inclusive finance has breathed new life into the agricultural enterprises' growth. Utilizing A-share agricultural companies listed on Shanghai and Shenzhen Stock Exchanges between 2011 and 2020 as our research focus, this study empirically explores the impact of digital inclusive finance on agricultural enterprise value, as well as the intervening role of financing constraints. Our findings reveal that digital inclusive finance significantly boosts the value of agricultural enterprises. This conclusion remains robust even after addressing potential endogeneity issues and conducting instrumental variable method-based robustness tests. Additionally, financing constraints serve as a mediator between digital inclusive finance and agricultural enterprise value. Consequently, agricultural enterprises should capitalize on the opportunities presented by digital inclusive finance, alleviate financing constraints, fulfill their capital requirements for production, operations, and innovation, thereby fostering enterprise growth and enhancing their overall value.

KEYWORDS

Digital Inclusive Finance; Financing Constraints; Agricultural Enterprise Value

1. INTRODUCTION

Agricultural enterprises, as the driving force of agricultural progress and emblematic of advanced productivity, are instrumental in propelling the high-quality development of the agricultural economy. As the operational scale of these enterprises expands, so does their need for funding during their development. However, the agricultural sector, due to its susceptibility to natural factors, technological limitations, and economic conditions, exhibits significant vulnerabilities in its production and operational processes. This vulnerability impacts its financing capabilities and business progress. Compared to other industries, agricultural enterprises encounter financing challenges primarily due to these reasons. Firstly, the agricultural industry is inherently fragile, with enterprises' operations being significantly influenced by natural environments. Abnormal climatic conditions or natural disasters can lead to losses in agricultural production or product transportation. Unlike industrial enterprises, agricultural enterprises primarily rely on living organisms as collateral, and these assets often have relatively low values, making it challenging for them to secure loans from financial institutions. Therefore, alleviating financing constraints and fulfilling capital requirements for agricultural enterprises' growth are urgent issues that need to be addressed in furthering their development.

The advancement of digital technologies, including big data, blockchain, cloud computing, the Internet of Things, and artificial intelligence, offers greater possibilities for swift and effective data collection, processing, and sharing. Digital finance and technology have emerged as critical drivers for transforming the economic model. Digital inclusive finance, which provides financial services to all sectors and groups of society, can significantly reduce the cost of accessing convenient financial

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services (Huang Zhuo and Wang Pingping, 2022) [1]. For agricultural enterprises, digital inclusive finance offers innovative financial products, broadens financial service coverage through information technology, lowers entry barriers, cuts financial transaction costs, and fuels the rapid expansion of the digital economy. It has emerged as a new growth engine and a catalyst for economic development.

2. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

2.1. Digital Inclusive Finance and Agricultural Enterprise Value

When the asymmetry in information diminishes, enterprises are more likely to seek external financing (Motta and Sharma, 2020) [2]. Leveraging the power of Internet platforms and big data technologies, digital inclusive finance can precisely identify the capital needs of agricultural enterprises, gather pertinent user information and credit demands through transactional data and enterprise formats, and subsequently offer tailored financial services (Heiskanen, 2017) [3]. Digital inclusive finance's platform advantages allow numerous small-scale investors in the financial market to engage in investment and financing activities, thereby expanding the pool of funds available (Qi Huaijin et al., 2020) [4]. Improving the information disclosure quality of agricultural enterprises can assist external investors in comprehending their business development.

Digital inclusive finance leverages the Internet platform and mobile terminals to conduct remote business transactions with agricultural enterprises, streamlining transactional procedures and easing financing constraints. This approach offers agricultural enterprises more convenient financial services and facilitates direct connections between enterprises and financial institutions (Zhang Yue, 2021) [5]. Furthermore, the advancement of digital inclusive finance presents agricultural enterprises with diverse financing options and funding avenues, enabling a broader range of agricultural enterprises to access and benefit from financial services, while also minimizing their transactional costs.

Based on this, this paper puts forward hypothesis 1: the development of digital inclusive finance can increase the value of agricultural enterprises.

2.2. Digital Inclusive Finance, Financing Constraints and Agricultural Enterprise Value

Financing constraints arise when enterprises encounter difficulties meeting their capital needs with internal funds and must seek external financing, often at high costs (Fazzari et al., 1987) [6]. Agricultural enterprises, due to their inherent vulnerabilities, are particularly susceptible to severe financing constraints in their investment, financing activities, R&D innovation, and business development plans. These constraints, stemming from insufficient funding, can hinder agricultural enterprises' ability to sustain their production and operations. However, the emergence of digital inclusive finance has the potential to reduce financing costs for agricultural enterprises. Given the high risks involved in agricultural production, traditional financial institutions often subject agricultural enterprises to rigorous qualification assessments, leading to increased financing costs. Digital inclusive finance, on the other hand, can optimize resource allocation, address credit distortions faced by enterprises, and thereby mitigate financing constraints (Li and Liu, 2022) [7].

The need for a stable cash flow is paramount for agricultural enterprises during production and operation, given the seasonal nature of agricultural production. During the procurement of raw materials, agricultural enterprises require significant funding to support their growth. Digital inclusive finance can alleviate their financing constraints, enabling them to access substantial financial support. This support is crucial for expanding business scale, funding investment projects, enhancing production capacity, promoting new product development, improving service levels, and exploring new markets (Li Xiaoling et al., 2020) [8].

Based on this, this paper proposes Hypothesis 2: digital inclusive finance can enhance the value of agricultural enterprises by alleviating financing constraints.

3. RESEARCH DESIGN

3.1. Sample Selection And Data Sources

This paper focuses on agricultural enterprises listed on the A-shares of Shanghai and Shenzhen Stock Exchanges from 2011 to 2020, utilizing data sourced from the CSMAR database. The sample data was preprocessed according to several methods: excluding ST and ST* enterprises, eliminating enterprises with missing or abnormal sample data, and processing the sample data with Winsorize to mitigate the impact of extreme values on the research outcomes. The digital inclusive financial index was jointly compiled and published by the Digital Finance Research Center of Peking University and the Ant Group Research Institute. The study employed the statistical software stata16.0 and ultimately obtained a total of 858 sample values.

3.2. Variable Definition

Variable being explained: Tobin Q. The calculation method is: Tobin Q = market value/total assets at the end of the period.

Explanatory variable: Digital Inclusive Finance (DIF). Divide the value of the digital inclusive financial index by 100, which is recorded as DIF.

Mediator variable: Financing constraints (SA). Its calculation formula is: SA = -0.737*SIZE + 0.043*SIZE2-0.04*AGE, where SIZE refers to the size of the enterprise, AGE refers to the age of the enterprise.

Control variables: The control variables included in this paper are diverse and comprehensive. Specifically, enterprise size (Size) is gauged by taking the logarithm of the company's total assets at the end of the fiscal year. Ownership concentration (Top10) is calculated by multiplying the proportion of shares held by the top ten shareholders to the total shares by 100. The enterprise listing age (Listage) is determined by subtracting the year of listing from the current year, adding 1, and then taking the logarithm. Enterprise growth (Growth) is measured using the growth rate of business income. Cash flow ratio (Cashflow) is calculated as the ratio of net cash flow generated from operating activities to total assets. Asset-liability ratio (Lev) is represented by the ratio of total liabilities to total assets at the end of the year. Additionally, this study also takes into account industry (Ind) and time (Year) dummy variables for further control.

3.3. Model setting

This paper establishes the following basic models to verify the impact of digital inclusive finance on the value of agricultural enterprises.

$$TobinQ_{i,t}=\alpha_0+\alpha_1 DIF_{i,t}+\alpha_2 \Sigma CONTROL_{i,t}+\mu_{i,t}+\lambda_{i,t}+\varepsilon_{i,t} \quad (1)$$

i refers to the enterprise, t refers to the year, α_0 refers to the constant term, α_i refers to the estimated parameter, $\mu i,t$ refers to the year dummy variable, $\lambda i,t$ refers to the industry dummy variable, $\varepsilon i,t$ is a random disturbance term.

This paper constructs the following intermediary model to test the intermediary role of financing constraints.

$$SA_{i,t}=\beta_0+\beta_1 DIF_{i,t}+\beta_2 \Sigma CONTROL_{i,t}+\mu_{i,t}+\lambda_{i,t}+\varepsilon_{i,t} \quad (2)$$

$$TobinQ_{i,t}=\gamma_0+\gamma_1 DIF_{i,t}+\gamma_2 SA_{i,t}+\gamma_3 \Sigma CONTROL_{i,t}+\mu_{i,t}+\lambda_{i,t}+\varepsilon_{i,t} \quad (3)$$

γ_1 is the direct effect of digital inclusive finance on agricultural enterprise value, $\beta_1\gamma_2$ represents the mediating effect, and α_1 represents the total effect.

4. EMPIRICAL ANALYSIS

4.1. Descriptive Statistic

The descriptive statistics of each variable are shown in Table 1. Among them, Mean refers to the average value of the variable, S.D. refers to the standard deviation of the variable, Min refers to the minimum value of the variable, Max refers to the maximum value of the variable.

Table 1. Variables Descriptive Statistics

Variable	Numbers	Mean	S.D.	Min	Max
TobinQ	858	2.1862	1.0883	0.9944	6.8689
DIF	858	2.3116	0.6570	0.6989	3.5153
SA	858	3.8703	0.2046	3.4172	4.4449
Size	858	22.1490	0.9721	20.3357	24.9398
Top10	858	59.8872	14.7061	25.9719	87.7577
Listage	858	2.2114	0.8203	0.0000	3.3322
Growth	858	0.1277	0.2612	-0.4866	1.3179
Cashflow	858	0.0665	0.0767	-0.1486	0.2949
Lev	858	0.3683	0.1763	0.0429	0.8718

4.2. Benchmark Regression Analysis

Table 2 presents the direct regression outcomes of digital inclusive financial development on the worth of agricultural enterprises. Column (1) displays the regression results without incorporating control variables, employing a two-way fixed effect model that considers both industry and year. Column (2) demonstrates the regression results after introducing control variables. Notably, even without control variables, the regression coefficient of digital inclusive finance on agricultural enterprise value stands at 4.2641, indicating a significant positive relationship at the 1% level. Upon introducing control variables, the regression coefficient reduces to 3.3929 but remains significantly positive at the 1% level. This underscores that the growth of digital inclusive finance has effectively mitigated information asymmetry in agricultural enterprises, diversifying their financing avenues. This enhances financial service accessibility, reduces transaction costs, fulfills enterprises' capital needs in production and operations, and ultimately boosts the value of agricultural enterprises. Therefore, hypothesis 1 is confirmed.

Table 2. Benchmark regression analysis results

	(1)	(2)
	TobinQ	TobinQ
DIF	4.2641***	3.3929***
	(3.5797)	(3.8781)
Size		-0.4783***
		(-3.5848)
Top10		0.0237**
		(2.1016)
Listage		1.2907***
		(4.0109)
Growth		0.2842**
		(2.4694)
Cashflow		1.7182***
		(2.7090)
Lev		-0.7303*
		(-1.7842)
_cons	-1.2048	6.2662*
	(-1.3633)	(1.9022)
Ind FE	Yes	Yes
Year FE	Yes	Yes
N	858	858
R-squared	0.1732	0.3022

The t-value statistics are in parentheses. *, **, *** are significant at the 10%, 5% and 1% levels, respectively.

4.3. Robustness Test

This paper employs three techniques to validate the robustness of the benchmark regression results. Firstly, to circumvent potential endogenous biases caused by reverse causality, the explanatory variable, Digital Inclusive Financial Development Level (DIF), is lagged. The corresponding findings, presented in Table 3's column (1), reveal a significantly positive regression coefficient of 8.53 for digital inclusive finance on agricultural enterprise value at the 5% level. Secondly, considering digital inclusive finance's susceptibility to market fluctuations, particularly the domestic financial crisis in 2015, the analysis excludes the sample period from 2015 to 2021. Instead, it focuses on the impact of digital inclusive finance on agricultural enterprise value from 2011 to 2014. The results in Table 3's column (2) indicate a significantly positive regression coefficient of 2.493 at the 5% level. Finally, this paper substitutes the explained variable by using return on assets (ROA) as a proxy for agricultural enterprise value and incorporates it into the base regression model. The results in Table 3's column (3) demonstrate a significantly positive regression coefficient of 0.1251 for digital inclusive finance on agricultural enterprise value at the 1% level. Through these three robustness tests, it becomes evident that the positive correlation between digital inclusive finance and agricultural enterprise value persists, thereby reconfirming the validity of hypothesis 1.

Table 3. Robustness test results

	Instrumental variable	Change the sample interval	Excluding municipalities
	(1)	(2)	(3)
DIF	8.5300**	2.4930**	0.1251***
	(2.1737)	(2.2496)	(2.7331)
Controls	Yes	Yes	Yes
Ind FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	830	252	858
R-squared	0.2590	0.2742	0.4836

4.4. Test of Mediation Mechanism

Using a mediating effect model, we tested the intervening role of financing constraints. The findings, presented in Table 4, indicate that the development of digital inclusive finance has a significantly negative impact on financing constraints for agricultural enterprises, with a regression coefficient of -0.0907 at the 10% level. Similarly, financing constraints exert a significantly negative influence on agricultural enterprise value, reflected by a regression coefficient of -3.6636 at the 5% level. When analyzed under the same model, digital inclusive finance exhibits a significantly positive effect on agricultural enterprise value, with a regression coefficient of 3.0606 at the 1% level. Therefore, it is evident that digital inclusive finance can facilitate the growth of agricultural enterprise value by easing corporate financing constraints.

Table 4. Intermediary Mechanism Test

	(1)	(2)
	SA	TobinQ
DIF	-0.0907*	3.0606***
	(-1.9325)	(3.5806)
SA		-3.6636**
		(-2.3604)
Controls	Yes	Yes
Ind FE	Yes	Yes
Year FE	Yes	Yes
N	858	858
R-squared	0.9266	0.3189

5. CONCLUSIONS AND IMPLICATIONS

Empirical research reveals a significant positive relationship between digital inclusive finance and the value of agricultural enterprises, a finding that remains robust after multiple tests. Additionally, financing constraints serve as a mediator in this relationship, as digital inclusive finance mitigates these constraints to enhance enterprise value. Therefore, agricultural enterprises should recognize the importance of digital inclusive finance in boosting their worth, leveraging it to expand financing

avenues and secure necessary funds for operations. By seizing development opportunities and adapting to the digital economy, these enterprises can allocate ample resources for innovation, product upgrades, and technological advancements, ultimately strengthening their market competitiveness and enterprise value.

REFERENCES

[1] Huang Zhuo, Wang Pingping. The role of digital inclusive finance in the development of digital agriculture [J]. Agricultural economic issues, 2022(05): 27-36.

[2] Motta V, Sharma A. Lending technologies and access to finance for SMEs in the hospitality industry [J]. International Journal of Hospitality Management, 2020, 86: 102371.

[3] Heiskanen A. The technology of trust: How the Internet of Things and blockchain could usher in a new era of construction productivity [J]. Construction Research and Innovation, 2017, 8(2): 66-70.

[4] Qi Huaijin, Cao Xiuqin, Liu Yanxia. The impact of digital economy on corporate governance -from the perspective of information asymmetry and managers' irrational behavior [J]. Reform, 2020(04): 50-64.

[5] Zhang Yue, Zhou Yingheng. Digital inclusive finance, traditional financial competition and rural industrial integration [J]. Agricultural technology economy, 2021(09): 68-82.

[6] Fazzari S, Hubbard R G, Petersen B C. Financing constraints and corporate investment [J]. 1987.

[7] Li Yongkui, Liu Xiaokang. Market Power and Government Role: Exploring the Mechanism of Digital Finance Promoting Enterprise Innovation [J].Western Forum, 2022,32(03): 46-62.

[8] Li Xiaoling, Cui Shulin, Lai Xiaobing. Can digital finance enhance the value of listed companies? Theoretical Mechanism Analysis and Empirical Test [J]. Modern Finance and Economics (Journal of Tianjin University of Finance and Economics), 2020, 40 (09): 83-95.