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Digital Economy, Government Intervention, and High-Quality Financial Development

Qiangxing Hu

School of Anhui University of Finance and Economics, Bengbu, Anhui, China

Abstract

High-quality development is the paramount principle in the new era, and the deep integration of the digital economy with the real economy serves as a crucial driving force for cultivating new momentum for economic growth and achieving high-quality development in the financial sector. Empirically, this paper measures the comprehensive levels of both the digital economy and high-quality financial development across 31 Chinese provinces from 2013 to 2022. Government intervention is characterized using word frequency data related to the digital economy extracted from provincial government work reports. Based on this, econometric analyses are conducted. The results demonstrate that the digital economy significantly promotes high-quality financial development. This conclusion remains robust after addressing endogeneity concerns by employing the interaction term between the 1984 number of post offices per 100 people and the previous year's information technology service revenue as an instrumental variable, and after controlling for fixed effects and conducting other robustness tests. Mechanism analysis reveals that government intervention amplifies the positive effect of the digital economy on enhancing the level of high-quality financial development. Furthermore, utilizing spatial and threshold models, we find that high-quality financial development and the digital economy exhibit significant spatial agglomeration effects. However, both the digital economy and government intervention exert negative spatial spillover effects on high-quality financial development. Additionally, government intervention exhibits a significant non-linear threshold effect on the relationship between the digital economy and high-quality financial development. To foster high-quality development in finance, it is essential to promote the vigorous growth of the digital economy, optimize and upgrade traditional financial mechanisms to integrate them into the wave of digitalization. Simultaneously, governments need to maintain firm confidence in the digital economy and implement a series of supportive policy measures. Moderate intervention is warranted to pave a solid path for achieving high-quality development in the financial sector.

Keywords

Digital Economy; High-Quality Financial Development; Spatial Spillover Effects; Moderating Effect; Threshold Effect.

1. Introduction

Enhancing the development quality of the financial system has emerged as a critical contemporary issue. This necessitates strengthening financial regulation, improving institutional mechanisms, and optimizing service efficiency to consolidate the foundation for financial development. Concurrently, the digital economy, recognized as a new economic form following agriculture and industry, is widely regarded as a core driver of modern economic systems. By fostering emerging industries, novel business formats, and innovative models, it underpins stable economic operations and promotes long-term, high-quality development [1]. The deep integration of digital technology with the real economy is viewed as a crucial pathway

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to address the challenges of achieving high-quality economic development, offering new advantages and momentum for such development.

Against this backdrop, a central question arises: What is the enabling role of the digital economy in advancing high-quality financial development? Specifically, how does the institutional environment mediate this relationship? Furthermore, what variations exist in the mechanisms through which the digital economy fosters financial development quality, particularly concerning its intrinsic characteristics and spatial distribution patterns?

Therefore, focusing on the enabling role of the digital economy in promoting high-quality financial development and adopting an institutional environment perspective to deeply analyze its positive effects on enhancing financial development, quality holds significant theoretical value and presents pressing practical relevance.

A review of the existing literature reveals that high-quality financial development is a multi-dimensional and multi-attribute concept. Its evaluation and measurement primarily concentrate on the macroeconomic level [2]. Achieving high-quality financial development necessitates deepening supply-side structural reforms within the financial sector, adhering to the principles of respecting common sense, conforming to objective laws, and upholding the rule of law, while clarifying key reform points at all levels [3]. Wu et al. [4] posits that high-quality financial development is characterized by market orientation, serving the real economy as its goal, manifesting in the optimization of financial structures, employing the continuous improvement of efficiency and equity in financial resource allocation as its means, and ensuring financial security. It represents sustainable financial development where financial functions align with the prevailing stage of economic development. Regarding the measurement of high-quality financial development, Gao et al. [5] synthesized its multi-dimensional connotations and measured China's financial industry development level across three dimensions: efficiency, equity, and sustainability. Xu [6], based on financial functional theory and sustainable financial development theory, provided an in-depth interpretation of the essence of financial development quality. He defined its scope to encompass five core dimensions: "financial scale, financial structure, financial efficiency, financial functions, and financial stability," collectively forming a comprehensive framework for high-quality financial development. Li et al. [7] argued that measuring financial development quality in the new era should not only reflect the development level of the financial sector itself but also incorporate factors reflecting how finance supports the economy in achieving the five development concepts of innovation, coordination, greening, openness, and sharing.

Emerging technologies, represented by internet technology, are currently the most widely applied and mature innovative technologies. Consequently, they have given rise to a series of new economic forms, including the digital economy [8]. Existing literature demonstrates that the digital economy can effectively drive high-quality economic development through multiple channels. For instance, Zhao et al. [9], through empirical analysis of evidence from Chinese cities, found that the digital economy exerts a significantly positive impact on high-quality development by enhancing entrepreneurial activity. Concurrently, Zhang et al. [10], utilizing China's provincial panel data from 2011 to 2020, also demonstrated that the digital economy can significantly promote high-quality economic development, with this promotional effect being more pronounced in the eastern and central regions. Furthermore, in the era of the digital economy, deepened cooperation and integration are identified as one of the key pathways to promote high-quality development in industrial finance[11]. Moreover, at the macro level, the digital economy can propel high-quality financial development through new input factors, enhanced resource allocation efficiency, and new total factor productivity.

Government intervention exhibits a double-edged sword effect in high-quality financial development. On the one hand, research by Zhang et al. [10] indicates that appropriate government intervention can optimize the layout and development environment of the digital

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economy, thereby promoting high-quality economic development. On the other hand, studies by Zhao [12] suggest that excessive government intervention may lead to issues such as resource misallocation and market distortions, consequently inhibiting economic innovation and growth potential. These contrasting perspectives highlight the complex role of government intervention in the context of the digital economy and high-quality financial development, providing theoretical background for this study. Similarly, there exists a bidirectional influence between government and the digital economy. For effective local government intervention, higher fiscal transparency serves as a supporting condition that enhances the positive impact of the digital economy [12]. Furthermore, excessively strong government intervention may undermine the decisive role of the market in optimizing resource allocation and could negatively impact collaborative innovation capabilities [13].

In summary, numerous scholars have conducted extensive research on the digital economy, government intervention, and high-quality financial development. These findings are crucial for understanding the intrinsic logic among these three elements. However, existing literature either focuses on studying one aspect in isolation or discusses pairwise relationships; few scholars have characterized and interpreted the intrinsic logic among the three based on localized data and theory. Building upon prior research and incorporating the latest empirical data, this article will systematically analyze the mechanisms and pathways through which the digital economy influences high-quality financial development across provinces, providing new perspectives and evidence for research in related fields. Beyond existing studies, this article makes the following marginal contributions: First, it employs spatial econometric techniques to analyze and interpret the influencing factors and spatial effects of the digital economy on high-quality financial development. Second, based on the policy orientation of deep integration and sustainable development of the digital economy and high-quality finance, it delves into the relationship between the digital economy and high-quality financial development from the perspective of government intervention, offering a novel understanding of the role governments play in fostering high-quality financial development.

2. Mechanisms and Research Hypotheses

The Report to the 20th National Congress of the Communist Party of China explicitly stated that "the digital economy will become a new engine of economic growth," requiring "accelerating the deep integration of digital technologies with the real economy to promote the transformation and upgrading of traditional industries." The digital economy contributes to exerting resource allocation effects and innovation effects, thereby driving finance to better serve the real economy [14]. Concurrently, an essential intrinsic requirement of high-quality financial development is returning finance to its fundamental purpose of serving the real economy, providing it with efficient and high-quality services[15]. That is, the digital economy can advance high-quality financial development by facilitating technological innovation and optimizing the efficiency of factor allocation, among other pathways [16]. Based on this, we propose:

H1: The digital economy facilitates high-quality financial development by exerting resource allocation effects and innovation effects, thereby promoting finance to better serve the real economy.

Both the digital economy and high-quality economic development exhibit significant spatial economic-geographic agglomeration effects [17]. As an emerging industry underpinned by digital technology [18], the digital economy can significantly promote high-quality financial development within the local region, but it exerts a constraining effect on high-quality financial development in neighboring regions[19]. Furthermore, the spatial effects of other distinct influencing factors on high-quality financial development vary. Among these, government

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intervention demonstrates significant direct and spillover spatial effects, with the former being positive and the latter negative [20]. Based on this, we propose:

H2: High-quality financial development and the digital economy exhibit significant spatial agglomeration effects. However, both the digital economy and government intervention exert negative spatial spillover effects on high-quality financial development.

Government intervention, fiscal decentralization, the level of rule of law, informatization level, and globalization all significantly promote high-quality financial development [20]. Specifically, government intervention plays a positive moderating role in the positive impact of the digital economy on high-quality economic development. Government participation can effectively mitigate problems arising from market failures, such as monopolies, negative externalities, and information asymmetry, thereby contributing positively to economic development [12]. Furthermore, threshold effect tests, employing government intervention as the threshold variable, reveal that as the intensity of government intervention increases, the positive effect of the digital economy on high-quality economic development gradually strengthens [10]. Based on this, we propose:

H3: Government intervention enhances the positive effect of the digital economy on elevating the level of high-quality financial development, and government intervention exhibits a threshold effect.

3. Empirical Examination of the Impact of the Digital Economy on High-quality Financial Development

3.1. Benchmark Regression Results

Table 1. Benchmark Regression Results of the Digital Economy on High-quality Financial Development

Variable	(1)	(2)	(3)	(4)
Ft	0.352***	0.323***	0.276***	0.253***
	(0.0521)	(0.0516)	(0.0540)	(0.0554)
Trans		-0.0586***	-0.0411***	-0.0311*
		(0.0136)	(0.0145)	(0.0170)
Con		-0.117	-0.178	-0.183*
		(0.106)	(0.109)	(0.108)
Dm			0.0169***	0.0249***
			(0.00444)	(0.00539)
Pfe			-0.373***	-0.314*
			(0.139)	(0.162)
Tax				0.163
				(0.418)
Fin				0.168**
				(0.0663)
Constant	0.147***	0.884***	0.747***	0.493*
	(0.0154)	(0.166)	(0.163)	(0.253)
N	310	310	310	310
R^2	0.3246	0.4355	0.4807	0.5325

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses. The same applies to subsequent tables.

Table 1 reports the benchmark estimation results examining the impact of the digital economy on high-quality financial development. As shown in column (1) of Table 1, the estimated

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coefficient of the core explanatory variable, the digital economy (Fq), is significantly positive. Furthermore, columns (2) through (4) demonstrate that the digital economy continues to exert a statistically significant and positive influence on high-quality financial development after the sequential inclusion of control variables. These findings suggest that the development of the digital economy does indeed significantly enhance high-quality financial development. This effect operates primarily by leveraging the resource allocation effect and the innovation effect, thereby promoting the financial sector's capacity to better serve the real economy and ultimately advancing high-quality financial development. The results provide empirical evidence supporting the validity of Hypothesis 1.

3.2. Moderating Effect Analysis

As evidenced in Table 1, a significant positive relationship exists between the digital economy and high-quality financial development. To further investigate the mechanism through which government involvement moderates this relationship, an interaction term between the digital economy and government involvement was generated and incorporated into the benchmark regression model. The results are presented in Table 2.

Table 2 reveals that the coefficient of the interaction term (Ft* Gov) carries the same sign as the coefficient of the digital economy variable in the baseline model (Table 1) and is statistically significant at the 10% level. This indicates that government involvement amplifies the positive effect of the digital economy on the level of high-quality financial development, thereby supporting Hypothesis 3.

This moderating effect may be attributed to the critical role government involvement plays in enhancing the digital economy's contribution to financial development. Specifically, governments can foster high-quality digital financial development and provide robust support for sustained economic growth through measures such as: Optimizing the digital economy environment; Guiding digital financial innovation; Strengthening financial regulation and risk prevention, and Promoting coordinated regional development.

Table 2. Benchmark Mechanism Test: Effect of the Digital Economy on High-quality Financial Development

Variable	(1)	(2)
Ft	0.245***	0.271***
	(0.0552)	(0.0562)
Gov	0.139**	0.117*
	(0.0647)	(0.0648)
Ft* Gov		0.959*
		(0.136)
Constant	-0.0177	-0.0704
	(0.349)	(0.329)
N	310	310
R^2	0.5252	0.5475

3.3. Spatial Spillover Effects Analysis

As presented in Table 3, within the SDM framework, the coefficient of the spatially lagged digital economy variable (W*Fq) and the spatial autoregressive coefficient (ρ) are both negative. This indicates the presence of both: Exogenous negative interaction effects stemming from neighboring provinces' digital economies, and Endogenous negative spatial interaction effects in high-quality financial development itself across provinces.

However, the regression coefficients of the spatial interaction terms cannot be directly interpreted as marginal impacts of the digital economy on local financial development. As

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emphasized in the spatial econometrics' literature, relying solely on point estimates to analyze cross-regional spillovers may yield biased inferences.

To accurately decompose the total effects, the partial derivative interpretation method proposed by LeSage and Pace [21] was employed: Direct effects quantify the impact of a change in an explanatory variable within a province on the dependent variable in the same province. Indirect effects (spatial spillover effects) measure the impact of a change in an explanatory variable within a province on the dependent variable in neighboring provinces.

Furthermore, based on the comparative analysis of the coefficients δ^2, goodness-of-fit (R^2), and log-likelihood values (LogL), the fixed-effects Spatial Durbin Model (SDM) estimated using the spatial contiguity weight matrix was ultimately selected as the final model.

Table 3. Spatial Econometric Regression Results: Effect of the Digital Economy on High-quality Financial Development

	SAR		SDM	
Variable	**Spatial Contiguity Matrix**	**Spatial Inverse Squared Distance Matrix**	**Spatial Contiguity Matrix**	**Spatial Inverse Squared Distance Matrix**
Ft	**0.248*** (0.0534)**	**0.253*** (0.0519)**	**0.239*** (0.0569)**	**0.246*** (0.0543)**
W* Ft			**-0.011 (0.114)**	**-0.183 (0.343)**
ρ	**-0.339*** (0.0868)**	**-1.248*** (0.255)**	**-0.351*** (0.0900)**	**-1.144*** (0.264)**
δ2	**0.00355*** (0.000289)**	**0.00336*** (0.000278)**	**0.00340*** (0.000277)**	**0.00317*** (0.000261)**
LogL	**430.472**	**433.857**	**436.824**	**443.521**
R2	**0.005**	**0.002**	**0.058**	**0.009**
N	**310**	**310**	**310**	**310**

3.4. Threshold Effect Analysis

Table 4. Regression Results of Government Intervention Threshold Effects

Variable	(1)
Ft(Gov< 4.1414)	-0.135 (0.110)
Ft(Gov≥4.1414)	0.245* (0.152)
Constant	-0.00451 (1.073)
N	310
R^2	0.184

The test results reveal heterogeneous effects of the digital economy on high-quality financial development across different levels of government intervention. When government intervention falls below the threshold value (4.1414), the digital economy exhibits a statistically insignificant negative impact on financial development. Conversely, when government intervention exceeds the threshold (4.1414), the digital economy demonstrates a significant positive effect. This implies that government intervention must reach a critical

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intensity-surpassing an "effectiveness threshold”to fully unleash the potential of the digital economy in advancing financial development. These findings underscore the importance of both policy magnitude and implementation quality.

Further analysis suggests that beyond its direct influence, the digital economy amplifies financial development through government intervention's moderating role. Specifically, when intervention intensity crosses the identified threshold, governments may implement supportive measures-such as tax incentives, capital subsidies, and other pro-digitalization policies-to foster deeper integration between the digital economy and financial systems. These interventions reduce operational costs for digital enterprises, enhance their innovation capacity and market competitiveness, and ultimately significantly enhance high-quality financial development.

4. Conclusion

The impact of appropriate government intervention and regulatory guidance on the digital economy's role in advancing high-quality financial development has emerged as a critical focus domestically and internationally. Under China’s national policy directives encouraging digital economy-driven financial services to the real economy, moderate government intervention proves essential for harnessing the digital economy’s potential to enhance financial development. Regulatory frameworks must achieve dynamic alignment with digital economic evolution, requiring governments to strengthen governance capacity and deepen understanding of digital economy mechanisms.

Using government intervention as a moderating variable within a Spatial Durbin Model (SDM), this study empirically examines the impact of the digital economy on financial development quality across China’s 31 provinces from 2013 to 2022. Key findings reveal:

First, the digital economy facilitates financial development by activating resource allocation efficiency and innovation effects, thereby enabling financial systems to better serve the real economy and ultimately drive high-quality financial advancement. Second, while significant spatial agglomeration effects exist between financial development quality and the digital economy, both digital economic activity and government intervention exhibit negative spatial spillovers on regional financial development. Third, government intervention amplifies the positive impact of the digital economy on financial development, but this moderating effect follows a threshold pattern. When intervention intensity falls below a critical threshold value, the digital economy exerts a negative influence on financial development; beyond this threshold, digital economic growth substantially promotes financial development.

Although government intervention in markets is a global phenomenon, not all interventions effectively stimulate financial progress. Crucially, moderate intervention-calibrated to institutional context proves necessary to optimize the digital economy’s capacity to serve the real economy and accelerate high-quality financial development.

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