

Review

# A Systematic Literature Review on the Influence Mechanism of Digital Finance on Economic Growth

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Received: March 22, 2022; Accepted: May 31, 2022; Published: July 10, 2022

**Abstract:** To further promote the theoretical research on digital finance's effective support for high-quality development of the real economy, this paper reviews the current status of domestic and foreign research on the impact mechanism of digital finance on the real economy and the impact mechanism of digital finance on economic growth. At present, domestic and foreign research on the impact mechanism of digital finance on the real economy mainly includes the basic transmission mechanism featuring the improvement of financing availability and guiding the flow of funds in the real economy, and the indirect transmission mechanism using innovation and R&D as a channel. Domestic and foreign research on the impact mechanism of digital finance on economic growth mainly includes: the direct impact mechanism featuring the improvement of financial services universality and efficiency, and the indirect impact mechanism with resident consumption, innovation and entrepreneurship, industrial structure transformation, and business environment as the channels. Future research directions include: deepening the research on the indirect transmission mechanism of digital finance to the real economy; expanding the research on the indirect impact mechanism of digital finance on economic growth.

**Keywords:** Digital Finance; Economic Growth; Real Economy; Influence Mechanism; Literature Review

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## 1. Introduction

Digital finance is a product of the combination of financial services with digital technologies including the Internet (mobile Internet and Internet of Things), big data, distributed technologies (cloud computing and blockchain), artificial intelligence, and information security (biometrics and encryption), which, together with Internet finance and fintech, are a series of financial innovation spectrum concepts, and the provision of inclusive and accurate financial services is its core attribute (Ma, Degong, and Teng, Lei 2020; Teng, Lei, and Ma, Degong, 2020) [1,2].

Along with the wide proliferation and deep penetration of digital finance, the existing pattern of difficult and expensive financing for the real economy has undergone a remarkable transformation. With features such as sustainability, wide-coverage, and near-zero marginal cost, digital finance can effectively support the recovery of the real economy. Because of this, some scholars have systematically explored the impact effect and transmission mechanism of digital finance on the real economy (Peking University Digital Finance Research Center Group, 2018; Wang Yanna et al., 2020)

[3,4]. At the same time, the impact of digital technology on the traditional financial sector and its far-reaching impact on the economy has received increasing attention from policymakers and scholars (Wang Yongcang and Wen Tao, 2020) [5]. Digital financial development may contribute to economic growth in several ways (Huang Yiping and Tao Kunyu, 2019; Qian Haizhang et al., 2020) [6,7].

In this paper, we will review the current status of domestic and international research on the impact mechanism of digital finance on the real economy and the impact mechanism of digital finance on economic growth, to further promote the theoretical study of digital finance to effectively support the high-quality development of the real economy. The remainder of this paper is structured as follows: part 2 introduces the impact mechanism of digital finance on the real economy; part 3 introduces the impact mechanism of digital finance on economic growth, and part 4 is a brief review.

## **2. Study on the Influence Mechanism of Digital Finance on the Real Economy**

### *2.1. Basic Transmission Mechanism: Digital Finance Can Boost the Real Economy, and There Are Structural and Regional Differences in this Effect*

On the one hand, digital finance improves the availability of finance to the real sector, eases liquidity constraints, and contributes to the real economy ratio. Appropriate relaxation of credit constraints is an important way to promote economic development (Banerjee, 2003) [8]. Guo, Feng et al. (2019) [9] argue that traditional financial institutions are increasingly focusing on the concept of digital finance, and they have continuously expanded the service scope and reach of digital finance and reduced financial discrimination with the help of fintech such as big data and cloud computing. New Internet financial platforms, such as Alipay, have lowered the threshold of financial services (payments, insurance, money funds, etc.) and provided financial services within reach of the financially disadvantaged (Yi Xingjian and Zhou Li, 2018) [10]. In addition, digital finance provides insurance services for the development of the real economy, which to some extent hedges the operational risks of the real economy and re-motivates the real investment. Financial development can improve productivity, reduce economic volatility, and promote economic development through better risk-sharing (insurance) (Ramey and Ramey, 1995) [11]. The credit function and insurance function of digital finance effectively provide entrepreneurs with capital and reduce entrepreneurial risk, which in turn increases their entrepreneurial motivation (Xie, Xuanli et al., 2018) [12].

On the other hand, digital inclusive finance is policy-oriented and targeted, which can, to a certain extent, curb the profit-seeking nature of capital and optimize the direction of capital allocation, guiding capital out of the overly prosperous financial and real estate industries and flowing to the real economy. The government attaches great importance to financial reform, and the central bank has repeatedly issued targeted downgrading policies for small and micro enterprises and the "three rural areas", mobilizing financial institutions to provide inclusive loans to disadvantaged economic groups. Micro and small enterprises have poor or no business records (Stiglitz and Weiss, 1981) [13], which makes it difficult for financial institutions to assess the integrity of enterprises (Agarwal and Hauswald, 2008) [14], and the lack of collateralized assets for micro and small enterprises makes financial institutions assume greater risks. Digital finance collects and integrates a large amount of behavioral data deposited by MSEs on the Internet, and with the help of financial innovation technologies such as big data, cloud computing, and artificial intelligence, and then constructs credit

assessment models for MSEs. This shows that digital finance is a feasible solution to improve the information asymmetry dilemma (Duarte et al., 2012; Jizun Li, 2015) [15,16].

It is worth mentioning that there may be structural and regional differences in the stimulation effect of digital finance on the real economy. Firstly, the structural differences are clarified. Digital finance includes three dimensions: breadth of coverage, depth of use, and degree of digitization (Guo, F. et al., 2019) [9]. The breadth of coverage and depth of use belong to traditional finance, and they have quite rich practical experience in supporting the real economy. China's finance is in the transition period to digital finance, digital financial facilities are not yet sound, and in general, the digitalization of China's financial development still needs to be improved, so the boosting effect of digital finance on the real economy still needs time to be tested. Secondly, we analyze the regionalization differences. The distribution of China's real economy shows the obvious characteristics of being strong from the east and weak from the middle and west (Wang Qian and Dong Yanling, 2018) [17]. At the same time, financial resources show a clustering trend (Zhang and Hui, 2016) [18], with the Pearl River Delta, Yangtze River Delta and Bohai Sea Rim regions having the richest financial resources. On the contrary, the central and western regions have the most severe bank exclusion and insurance exclusion in the central rural areas, and the most severe Internet financial exclusion in the western rural areas (Su, F. and Fang, L., 2016) [19], and these regional differences will certainly limit the boosting effect of digital finance on the real economy. Thus, digital finance can boost the real economy, and there are structural and regional differences in this effect.

## *2.2. Indirect Transmission Mechanism: Digital Finance Can Boost the Real Economy Through Innovative Mechanisms*

Over the past 40 years of reform and opening-up, China's real economy once relied on a factor- and investment-driven crude growth model, which gradually revealed a series of problems such as overcapacity in low-end industries, environmental pollution, and resource shortage, foreshadowing the urgent need for technological innovation changes in China's real economy to continue to provide a strong impetus for economic growth. Waldorf (1989) [20] empirically found that in the United States about two-thirds of the contribution of technological progress to economic growth can be explained by talent innovation. Zhang Lin (2016) [21] found that technological innovation has significantly contributed to the growth of the real economy in both the short and long term. The development of the real economy is the foundation of economic growth, and the fundamental path to promoting the real economy cannot be separated from science and technology innovation (Long, 2018) [22]. It can be inferred from this that innovation R&D is the fundamental driving force to solidify the sustainable growth of the real economy. According to practical experience, the intrinsic mechanism of the driving role played by innovation R&D can be summarized as follows.

First, innovative R&D can nurture the birth and growth of new industries and promote the transformation of China's real economy from low value-added to high value-added; second, innovative R&D can provide traditional manufacturing industries with automated production lines, optimize the combination of factor inputs, reduce energy consumption, pollution and production costs, and thus improve the production efficiency, product quality and profitability of traditional manufacturing industries; third, China's high-tech Third, China's high-tech development zones and technology towns strongly support the industrial clustering effect of innovative R&D, which enables each region to form unique industrial advantages and avoid the tidal wave phenomenon of

homogeneous production and cheap products, thus optimizing the industrial layout of each city cluster according to local conditions.

Technological progress is the source of economic growth, while innovative R&D is an important guarantee to promote technological progress. Numerous previous studies have confirmed that financial development can significantly promote technological innovation (Maskus et al., 2011; Miaomiao Li et al., 2015) [23,24]. Specifically, Chowdhury and Maung (2012) [25] proposed that financial development enhances investment in innovation R&D by reducing the degree of information asymmetry. Zhang (2012) [26] suggested that both the scale and efficiency of financial development can stimulate innovative R&D. As research continues to advance, the impact of digital finance on innovation R&D, in addition to traditional finance, cannot be ignored. Liang, Pang and Zhang (2019) [27] found that digital finance can promote innovation in SMEs by easing access to financing. This shows that digital finance can boost the real economy through innovative mechanisms.

### **3. Study on the Influence Mechanism of Digital Finance on Economic Growth**

#### *3.1. Digital Finance Enables Financial Services to Reflect Better Inclusiveness and Higher Efficiency*

Digital finance lays the foundation for low-income and vulnerable groups to access low-cost financial services and is, therefore, an important source for achieving low-cost, broader coverage and more sustainable financial inclusion (Xie, 2016) [28]. While providing effective and sustainable financial services to SMEs and low-income households is extremely challenging for any country around the world, the rise of the digital finance industry in China proves that with the help of digital technology, digital finance, especially mobile payments and online lending, overcomes geographical barriers and the blind spots of traditional risk assessment to achieve lower-cost access to SMEs and all types of people everywhere, especially In addition, with the help of "big data", digital finance, especially mobile payment and online lending, has overcome geographical barriers and traditional blind spots in risk assessment to provide more convenient financial services at a lower cost to SMEs and all kinds of people everywhere, especially those in less developed areas and low-income society. In addition, credit scoring models that leverage "big data" information can help mitigate financial frictions such as information asymmetries caused by the fragmentation of China's credit market, and it also pushes the "frontier" of credit accessibility to companies with lower credit scores by significantly improving risk control methods. It also pushes the "frontier" of credit availability to companies with low credit scores by significantly improving risk control methods. Internet lenders have an information advantage over traditional financial institutions in credit assessment (Frost et al., 2019) [29], and digital financial credit providers such as Ant Financial and Wezuo Bank have a competitive advantage over traditional commercial banks due to stronger credit rating systems, cheaper distribution channels, and more pronounced information advantages (Hau et al., 2019) [30].

For micro-entities, digital finance development reduces the financial transaction costs for residents and small, medium, and weak entities. Information technology-based digital finance is an important driving force of business model change (Jiang Xiao Juan and Luo Libin, 2019) [31], which has changed the face-to-face transaction model in traditional business models, greatly reducing the transaction costs of traditional financial services and improving transaction efficiency (Zeng and Reinartz, 2003) [32]. Compared with the traditional financial business model, digital finance pays more attention to the scale effect and tail effect, the accumulation of existing data reduces the

marginal cost of developing related business, and the Internalization of the business model also makes the coverage of digital finance unrestricted by time and space (Lu, 2018) [33], which precisely solves the problem of diseconomies of scale of traditional finance. In addition, the development of digital finance facilitates the service upgrade of traditional financial institutions and effectively alleviates the problem of financial exclusion. Due to risk considerations, traditional financial institutions are often reluctant to provide financial services to small, medium, and weak subjects, who face a difficult capital shortage problem (Li and Han, 2019) [34]. Digital financial development, through information technology, is convenient and fast, but also has the advantage of low cost, which enables underdeveloped areas to enjoy the same financial services, cracking the long-standing problem of insufficient financial services and making up for the lack of traditional financial services. Taking commercial banks as an example, the use of Internet technology by commercial banks has created rich application scenarios and enhanced user experience, which is conducive to the improvement of commercial banks' efficiency and undoubtedly helps alleviate the problem of financial exclusion.

### *3.2. The development of Digital Finance Has Boosted Consumer Spending by Facilitating the Customer Experience*

One of the reasons for the decline in China's economic growth is the low consumption, which has also become an important driving force of China's economic growth under the new economic normal. Mobile payment in digital finance facilitates customers' payment experience, and risk assessment based on real transaction behavior weakens the requirement of collateral and facilitates customers to carry out cross-consumption. From this perspective, the development of digital finance has changed customers' attitudes towards consumption and facilitated the transformation and upgrading of consumption. In the case of service consumption, for example, through digital diffusion, residents are more willing to consume food and beverage, healthcare, entertainment, and education and culture, and digital financial development has played an active role in promoting consumption upgrading and encouraging consumer demand (Yi, Xingjian, and Zhou, Li, 2018) [10].

Digital finance has an impact on residents' consumption and consumption upgrading in three main ways (Yang, W. et al., 2021) [35]. First, digital finance reaches users mainly through an online model, which can expand the coverage of financial services and make credit support more accessible to the general population. During 2019 Double 11, more than 8 million products in Tmall and Taobao were available in interest-free chanting instalments, and the transaction volume of Jingdong White Strip broke 100 million in 10 seconds. Zhao Baoguo and Gai Nian (2020) [36] found that compared to basic subsistence consumption expenditure, the credit allocation strength of Internet finance has a higher contribution rate to residents' development of enjoyment consumption expenditure. Second, digital finance contains a diversity of financial services such as funds, insurance, and investment. Compared with the low return of traditional savings, digital finance can improve the level of residents' return on investment and financial management (Yang, Weiming et al., 2020) [37]. According to Xing and Zhang (2019) [38], the wealth effect brought by Internet finance can effectively increase the consumption level of residents. In addition, data show that as of the end of 2019, the overall wealth management scale of Yu'e Bao was about 1.09 trillion yuan, of which 99.8% was occupied by individual investors, bringing 21.3 billion yuan of income to customers throughout the year, and the higher level of income has laid a certain foundation for promoting consumption. Third,

the convenience and low transaction costs of digital finance have an important impact on residents' consumption. Expanding leisure tourism spending is one of the important elements of consumption upgrading, and Guo Yingzhi and Li Xiaomin (2018) [39] found that future travelers will use mobile payments more often to purchase tourism products.

### *3.3. For Society as a Whole, Digital Financial Development Promotes Technological Innovation and Regional Entrepreneurship*

As a representative of the new financial model, digital finance development provides new opportunities to solve the financing of small and medium-sized enterprises and promote the development of innovation and entrepreneurship (Yin et al., 2019; Xie et al., 2018; Liang and Zhang, 2019) [40,12,27]. Along with China's economy entering a new normal, the Chinese government has implemented an innovation-driven development strategy to achieve high-quality economic development. By alleviating financial exclusion and increasing the availability of financial services, digital finance provides appropriate funding for the promotion of innovation and entrepreneurship, which is conducive to the formation of "mass entrepreneurship and innovation" and thus promotes China's economic growth. For example, Beck et al. (2018) [41] construct a general equilibrium model using mobile payments in digital finance as an example and confirm that mobile payments in Kenya can ultimately promote economic development by enhancing entrepreneurship. Yanqin Lv and Bin Zhao (2020) [42] argue that digital inclusive finance better serves rural MSMEs, alleviates financing difficulties, promotes entrepreneurship and employment, increases the flow of capital, and increases aggregate social demand, thus boosting economic growth. Ma Degong and Teng Lei (2020) [1] argue for the transmission mechanism of the role of digital finance development in alleviating the financial constraints of entrepreneurship and thus achieving inclusive growth. Some studies suggest that digital finance can create economic value by promoting technological innovation and supporting entrepreneurship. For example, credit histories based on Internet transaction information can effectively facilitate e-commerce sales and transactions, and this promotion is more significant for young firms and young entrepreneurs (Hau et al., 2019) [30]. Online loans offered to e-commerce entrepreneurs can improve the quality of service for such consumers and help them mitigate financial and operational shocks in a more effective manner (Huang et al., 2018) [43]. Chinese digital finance companies that have leveraged the online credit market can offer a richer product range than firms not involved in Internet lending (Frost et al., 2019) [29]. In addition, it was also found that by combining the Digital Inclusive Finance Index with household survey data, the use of mobile payments was found to significantly increase the likelihood that farmers would become self-employed in the future and would also significantly increase their income (Wang, 2019) [44].

### *3.4. Digital Finance Promotes Regional Economic Growth by Facilitating the Structural Transformation of Industries*

In addition to directly promoting economic growth, digital finance can also promote economic growth by facilitating industrial structural transformation (Linhan Li and Weimin Tian, 2021) [45]. The development of digital finance promotes industrial structure transformation mainly in the following ways: 1) The development of digital finance requires the completion of digital infrastructure. The development of digital infrastructure will prompt enterprises to use Internet thinking and rely on digital technology to optimize enterprise management mode, improve

enterprise productivity and informatization level, and promote the transformation of enterprises to intelligent networking, that is, digital finance can promote the transformation and upgrading of industrial structure through the development of digital infrastructure (Xi Enchong et al., 2013) [46]. 2) The development of digital finance is mainly reflected in the information service industry Development level. The so-called information service industry is an industry that uses the advanced technology of the Internet to collect, process and handle network information, and feeds it back to users with information-based products. With the progress of digital technology such as the Internet, the information service industry has become more and more closely connected with the manufacturing industry, and within the manufacturing industry, the degree of automation and production efficiency has also been improved with the help of the improvement of information technology level. The integration of the information technology industry and manufacturing industry has become the current trend, and the two promote each other, which can realize the transformation of the manufacturing industry, that is, digital finance can promote the transformation and upgrading of industrial structure through the deepening of digital industry (Tao Changqi and Zhou Xuan, 2015) [47]. 3) The development of digital finance must not leave the promotion of digital technology, and the upgrading of industrial structure is also the process of continuous improvement of technological innovation. At the enterprise level, the emergence of emerging technologies such as the Internet can help enterprises reduce information acquisition costs and transaction costs and improve operational efficiency, while in terms of digital technology it is necessary to integrate existing technologies faster and better, promote the emergence of new technologies, achieve the optimization of the Internet of Things, artificial intelligence and big data, and help enterprises achieve data integration and intelligent manufacturing, i.e., digital finance can continuously enhance through technological innovation the boosting effect on industrial structure transformation (Chihiro et al., 2018) [48].

### *3.5. Digital Finance Can Promote Economic Growth by Improving the Business Environment*

Digital finance can optimize the governmental, market and legal environments by reducing transaction costs and easing financing constraints, as well as enhancing the human environment by releasing the vitality of innovation and entrepreneurship, thus playing a role in improving the business environment. First, digital finance relies on Internet technology to shorten the time for traditional financial institutions to review and issue loans from months to seconds, and the speeding up of the loan approval process reduces transaction costs and improves transparency in the process of corporate financing, thus effectively optimizing the governmental environment. On the one hand, digital finance can rely on soft information such as credit records and transaction data tracked by big data technology as the basis for credit assessment, breaking through the financing dilemma suffered by small and micro enterprises due to the disadvantage of hard information such as financial statements, and on the other hand, it can expand the coverage of financial services through information technology and lower the access threshold of the credit market, both of which will alleviate the financing constraints and credit discrimination of small and micro enterprises and enhance the market environment of fair competition; thirdly, digital finance can reduce the non-productive expenses of enterprises. Traditional financial institutions use credit rents of enterprises as an important identification tool for whether to borrow or not, which can breed rent-seeking behaviors among approval and credit-granting personnel in charge of credit and increase additional costs of enterprise financing, while the emergence of digital finance reduces manual intervention, eliminates

the space for rent-seeking in the approval process, and reduces the human and relationship fees of enterprises in the financing process, thus playing a role in improving the legal environment. Fourth, the emergence of digital finance also promotes the rapid development of e-commerce, releasing more business opportunities and greater entrepreneurial vitality, which breeds fertile soil for "mass entrepreneurship and innovation" and thus enhances the human environment (Zhang and Yu, 2021) [49]. The positive effect of the business environment on economic growth can be realized through at least three channels. First, where the business environment is more perfect, the laws for property rights protection are also more strictly enforced, and the protection of good property rights is conducive to absorbing more FDI, which also helps to increase domestic private investment, thus promoting economic growth (Dong et al., 2012) [50]; second, a good business environment helps to reduce rent-seeking behavior and lower transaction costs, releasing greater market dynamics, breeding more independent innovation and promote economic growth (Xia Houxue et al., 2019) [51]; finally, the optimization of the business environment can also break administrative monopolies, reduce inequality of opportunity, and narrow the income gap (Shi Xinjie et al., 2018) [52].

#### 4. Brief Review

At present, domestic and foreign research on the impact mechanism of digital finance on the real economy mainly includes: the basic transmission mechanism featuring the improvement of financing availability and guiding the flow of funds in the real economy, and the indirect transmission mechanism with innovation and R&D as the channel. Domestic and foreign studies on the impact mechanism of digital finance on economic growth mainly include the direct impact mechanism characterized by improving the universality and efficiency of financial services, and the indirect impact mechanism with resident consumption, innovation and entrepreneurship, industrial structure transformation, and business environment as the channels. However, scholars at home and abroad have studied the basic transmission mechanism of digital finance to the real economy more abundantly, while the research on the indirect transmission mechanism is relatively weak; therefore, the research on the indirect transmission mechanism of digital finance to the real economy needs to be further deepened. In addition, although domestic and foreign scholars have conducted rich research on the indirect influence mechanism of digital finance on economic growth, the mediating variables involved are still not comprehensive enough, therefore, the research on the indirect influence mechanism of digital finance on economic growth needs to be further expanded.

**Funding:** This research was funded by the Regional Project of National Natural Science Foundation of China, grant number 71861003.

**Conflicts of Interest:** The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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