Analysis of the Mechanisms of Fintech Development in China

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Abstract: Chinese economic has developed towards new standards and directions. High-quality is a specific requirement of the new stage of economic development, which not only shows the basic color but shows a new direction of Chinese economic. Promoting economic development has become a significant issue. The role of financial development in promoting economic growth has been widely tested, and defined as innovations in the concordance of digital technology and finance. It can maximize its inclusiveness and accuracy with the support of technology. In addition, economic development has become a great role in the new era. This paper aims to analyze the influence of technology finance on the efficiency of financial innovation, analyzing the relationship between two factors. It combines specific empirical analysis to understand the current circumstance of financial innovation development in China. Moreover, it tries to put forward theoretical suggestions for developing a high-quality economy, expanding digital infrastructure construction, and innovating the development of technology finance. These will help strengthen the accuracy of technology finance regulation and maintain the reasonable growth of finance technology.

Keywords: Technology Finance; Financial Innovation; Impact

1. Introduction

In the 20th National Congress report in 2022, it is proposed that China should improve the capability of independent innovation and structure an innovative scenario, which is the core element of our development strategy. China should improve its investment in innovation, break through the barriers of technological restrictions, apply independent innovation to enterprises under the guidance of market mechanisms, improve productivity, and promote the development of the virtual economy (Luo et al, 2022). With the policy of supply-side structural reform, Chinese industry presents the trend of going out of production capacity and adjusting the structure; the economy tends to develop in high quality. Compared with the waste of resources in the previous brutal economy, the development of the Chinese economy focuses more on finance and intensification (Huang et al, 2022).

A sound financial system will help improve information asymmetries, identify and invest in innovative and competitive industries and firms, and facilitate efficient capital allocation and other factors (Gu et al, 2021). It focuses more on providing financial services and products on a peer-to-peer basis, which can help solve the long-standing problem of inclusiveness in traditional finance. On the one hand, the development of fintech can maximize the participation of SMEs (Small and Medium Enterprises) in the financial services system (Łasak, 2022). Thus, improving the efficiency of the financial economy becomes possible. On the other hand, the relationship needs to be further studied to clarify the impact fintech development on financial economy efficiency (Wang et al, 2022). The goal is to better guide the promotion of fintech development and solve the dilemma of SMEs fintech constraints (Li et al, 2022).

1.1 Purpose and significance of the study

The research objectives are the impact of fintech on the efficiency through the empirical analysis of the research sample to systematically elaborate the intrinsic linkage of finance for Chinese financial economy. It highlights the overall integration and coordination in the development of digital technology economy and analyzes the relationship between the experience value of this theoretical profile and its own design level, and provide specific data sources and optimization suggestions for the operability of this

thesis in view of the current situation of digital technology finance development. The study takes the data of A-share listed companies from 2011-2019 as the entry point of the study to explore the efficiency and influence of listed enterprise companies in the financial economy development (Zhou et al, 2022). It makes a comprehensive quality measurement to come up with specific operational improvement suggestions for SMEs technology economy.

1.1.1 Theoretical significance

Chinese financial innovation efficiency involves fewer research theories, while the development of financial innovation efficiency is manifested in the contribution and utilization of the development of the economy (Hsu et al, 2021). Chinese financial innovation efficiency in the actual region reflects the content of previous studies as well as research indicators are not comprehensive and in-depth enough, and lacks higher-level theoretical guidance of fintech. At the same time, the objects of research are mostly economically developed regions such as Jiangsu, Zhejiang and Shanghai, and less attention is paid to the financial innovation efficiency situation in other regions (Hou et al, 2021). Therefore, the research on the influence of fintech on the efficiency of financial innovation has important theoretical guidance, which improved the theoretical guidance for financial innovation efficiency in China, and making up for the vacancy and deficiency of financial innovation efficiency development in other enterprises under certain theoretical significance.

2. Literature review

Financial development theory focuses on the relationship between financial development and economic growth, and how to effectively formulate financial policies and maximize economic development (Hsu et al, 2021). Among the various instruments and links of finance for economic growth, the STI link occupies a considerable proportion. According to the theory, the mechanism of the role of finance in promoting fintech innovation has several aspects. First, the financial system should provide means and channels for fintech innovation to prevent, avoid and resolve innovative risks (Bu et al, 2022). Second, the size of a country's fintech innovation capacity and the number of achievements depend mainly on the country's financial development policy, which influences the financial system's financial support for SMEs and fintech innovation enterprises through policy guidance (Menne et al, 2022).

2.1 Theoretical overview

The general feature of technological growth is the use of the Equilibrium analysis approach to examine the equilibrium conditions required to achieve steady-state equilibrium growth in the long-run dynamic process of S&T growth by developing various economic models (Li et al, 2022). There are two most common interrelated definitions of S&T growth. The other considers S&T growth as a sustained increase in real output on a per capita basis, i.e., per capita real output.

2.1.1 Theory of scientific and technological development

The theory of technological development is the study of the evolution of the modernization of the model of a country on the basis of economic growth. The theory of technological development is an in-depth study of the economic development of developing countries, which, until the 1950s and 1960s (Al-Shamsi, 2022). It was an increase in per gross national product (GNP). The rapid growth of GNP per capita in some countries was not accompanied by a corresponding improvement in their social, political and economic structures, and poverty and income inequality were still very high (Xu et al, 2022).

2.1.2 Inclusive Growth Theory

In terms of international development, inclusive growth is the principle of common development, they share equal development opportunities, and treat the peaceful development of other countries with an inclusive attitude (Nogueiro et al, 2022). All classes can integrate into the tide of economic development, enjoy development opportunities equally, and share development dividends.

3. Methodology

Literature research method: through collecting and reading the domestic and foreign literature related to the research on fintech. Theoretical data were collected and organized through the research and analysis of theoretical data related to fintech to provide theoretical references for the study.

Case study method: this paper takes use of economic development of listed enterprises as the entry point of the study, and analyzes the economic development of fintech for some of these enterprises. It systematically elaborates the impact of fintech development strategy on financial and economic efficiency and extracts data, analyzes and puts forward relevant suggestions.

Qualitative analysis is combined with quantitative analysis. First, this paper presents the theory of the impact of science finance on economic development from a qualitative perspective, analyzes the possible drivers of these two factors, and proposes relevant research hypotheses. Secondly, the way of influence is analyzed empirically and quantitatively by building an appropriate model.

3.1 Domestic and international status studies

Yang, Long and Hu (2010) used the entropy method to construct a comprehensive environmental pollution index by introducing pollution output indicators to measure the economic development and called it "financial economic efficiency". Qian and Liu (2013-2015) argue that although Yang and Hu have provided a preliminary explanation of "financial economic efficiency", it is still a bit weak. On the basis of Yang and Hu, Qian and Liu (2013-2015) elaborate "financial economic efficiency" as follows: Financial economic efficiency is an indicator to evaluate or measure the economy of a region based on the consideration of resource inputs and environmental outputs, which refers to the possible consideration of inputs and outputs in the production process under the resource constraint. The inputs and outputs are part of the FST metric further Qian and Liu argue that the connotation of financial economic efficiency includes the following two aspects: first, financial economic efficiency can be used as an evaluation indicator of economic efficiency, and second, measuring financial economic efficiency should consider not only consensual output but also non-consensual output efficiency. Chen Shi (2010), Li Ling and Tao Feng (2012), Qian Jingming and Liu Xiaochen (2015) explore the financial economic efficiency and find that environmental regulation helps to improve financial economic efficiency in the long run, but the opposite is true in the short run, while Lin Boqiang and Liu Honghong (2015) start from the perspective of foreign trade. The results show that foreign trade can further promote the total factor efficiency of energy environment and thus improve the efficiency of financial economy through technology spillover. Peng Xiangsheng (2016), there are three major significant differences between science finance and traditional finance: first, it focuses on equality, science finance considers the equality of access to financial services for all segments of society; second, it considers the cost of services, science finance insists on affordable costs; third, it emphasizes sustainability, science inclusive finance must operate under a sustainable development mechanism.

3.2 Status of foreign research

Foreign countries pay more attention to the theory of digital technology financial mechanism, especially in the financial and economic development not only has a very perfect knowledge system but also has the relevant laws and regulations for institutional protection. As early as the 1970s, many Western countries began a systematic study of digital technology surprisingly related theoretical approaches and operational concepts; digital technology financial theory not only serves the region but also has a particularly strong radiation effect, which not only drives the local economic development but also becomes a powerful driving force for the national economy; based on such objective factors, in terms of operational concepts have a humane thinking and individual development of The differentiated needs of individual design.

In recent years, foreign studies on the impact of financial development. Financial economic efficiency have become a hot topic of academic research. Beck et al. (2000) and Kumbhakar and Sadorsky (2010) uses panel data for 22 emerging countries from 1990-2006 and employs a generalized system of moments estimation method to find that financial development can improve the efficiency of energy consumption. Further Sadorsky (2011) studied nine economies along the borders of Central and Eastern Europe and South Africa respectively and found that financial development helps to increase energy consumption efficiency and reduce carbon

emissions. Brunnschweiler (2017) uses panel data for 119 non-OECD countries from 1980-2006 and finds that financial intermediation, represented by commercial banks, can be effective in increasing renewable energy production and thus reducing carbon emissions from conventional energy consumption. Honohan (2008) measures the share of the population using bank accounts and microfinance accounts in the total population of the society by measuring (Beck et al. (2009) measured the level of development of technology finance through two dimensions: availability of financial services and effectiveness of financial services use. Arora et al. (2010) measured the level of development of technology finance in terms of ease of transactions, transaction costs, penetration of financial services, and availability of financial services, etc. Klapper et al. (2006) argued that the development of technology finance can promote more entrepreneurs who lack capital but are competitive, and the entry of these start-ups can help both Bruhn and Love (2014) examine the contribution. It also increased availability of financial services to the income and employment of low-income groups. financial services, which in turn increases their tolerance for risk.

4. Analysis and discussion

4.1 Variable definition

Corporate financial innovation. This study measures corporate financial innovation in terms of the number of technology patent applications, referring to Wang, Xin and Wang, Ying (2021), Qi, Shaozhou et al. (2018) and others.

Technology Finance Index. Based on the mutual achievement relationship between technology finance and fintech and the wide application of previous literature, the text refers to the digital finance research center of Peking University and Ant Financial Services Group based on the massive digital finance related data. For the sake of measurement, this paper divides the technology finance index by 100 first, and then carries out subsequent measurement processing.

The firm leverage, ROA, firm age, firm sole director ratio, firm size, firm equity concentration, and Tobin's Q were used as control variables. The specific calculation method is illustrated by Table 1.

4.2 Descriptive statistics

Table 2 reports the basic statistical characteristics of the main variables. In order to adjust the magnitude and weaken the heteroskedasticity, this study divides the Fintech development index by 100, and the age of firm survival is also logarithmically treated.

4.3 First exploration of the model

The data in this paper are the panel data of A-share listed companies from 2011 to 2019. Since the fixed-effects model is an effective analysis method for panel data, this paper selects the fixed-effects model to conduct a study on the relationship between technology finance indexes and corporate financial innovation.

4.4Model construction

To test the relationship between fintech development and firm innovation performance, the benchmark model is first constructed as follows.

$$patent = \beta \times index + \sum_j^n \alpha_{it} X_{it} + \lambda_t + \mu_i + \varepsilon_{it} \quad (1)$$

where.$patent$ is the variable in this paper, representing the level of financial innovation of firms.β is the core explanatory variable of interest in this paper.$index$ represents the financial inclusion development index.

5. Analysis of the empirical results

5.1 Baseline model regression results

Figure 3 shows the average level of financial efficiency of different provinces in China. The decomposition of financial economic

efficiency reveals that the distribution of energy efficiency, carbon emission efficiency, energy carbon emission efficiency and total factor efficiency of environment and energy is more or less the same, and the average value of the eastern coastal region is higher than that of the central and western regions. By type, the mean values of energy efficiency, carbon emission efficiency, energy carbon emission efficiency and environmental energy total factor efficiency in the eastern region are higher than 0.75, which is also significantly higher than those in the central and western regions. Thus, it can be predicted that there may be regionalized differences in the level of financial inclusion development, which in turn affects the financial and economic efficiency of different regions.

5.2 Heterogeneity test

5.2.1 Scale heterogeneity

By taking logarithms of firms' total assets, we classified all firms into three categories: small, medium, and large firms, and regressed the three categories to explore possible firm size heterogeneity between the relationship between technology finance and corporate financial innovation.

From the results, it is clear that the development of technology finance has a positive effect on the financial innovation of small, medium and large enterprises, with the most obvious utility for large enterprises.

5.2.2 Stability test

Since the number of patents of listed companies has a large number of zero values and is characterized by truncated data, this paper uses the Tobit model to further test the impact of the technology finance index on corporate innovation.

With the above results we find that column (1) to column (8) we have added control variables one by one, and (8) contains all control variables, which shows that the development of technology finance still has a significant positive contribution to corporate financial innovation. This is consistent with the structure of our benchmark regression, and therefore we consider that it passes the robustness test.

6. Conclusion

In the study, using the data of A-share listed companies from 2011-2019, the environmental economic efficiency of listed companies is more significant than that of SMEs, while the environmental economic efficiency of SMEs is lower than the national average. On this basis, the Tobit regression model is used to empirically test the impact of the level of technology finance development on financial economic efficiency, and it is found that technology finance development helps to improve energy efficiency, carbon efficiency, energy and carbon efficiency, and total environmental efficiency.

(1) In order to require enterprises to modernize energy-using technologies, update existing technologies in a timely manner, and upgrade and modernize high energy-consuming equipment in order to reduce energy consumption.

(2) The development of inclusive financing should be comprehensively promoted. Both parties should effectively take up the important responsibility of promoting the development of fintech. The government should lead the development of fintech, taking into account not only the local economy and the applicability of policies, but also the perspective of MSMEs. Financial institutions should play a key role in lowering the threshold for loan applications, promoting targeted financing, and using other means to solve the financial problems of SMEs in the process of technological upgrading and equipment refurbishment, thus alleviating the credit constraints of SMEs and promoting the optimal allocation of financial resources.

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