Fintech and the IPO: Evidence from China

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Abstract. IPOs are of great significance to the development of firms, but many firms go extinct some time after conducting an IPO, which seriously hinders the long-term development of firms. Based on the data of Chinese A-share listed firms from 2005-2021, this paper investigates the relationship between fintech development and firms' survival time after IPO using a panel fixed effects model and a mediating effects model, and applies a double difference model to test the endogeneity problem. The study finds that the development of fintech can extend the time to survival after IPO by alleviating financing constraints, reducing transaction costs and accelerating the development of financial inclusion. And this impact is heterogeneous, meaning that the effect is more pronounced in the eastern China, where the level of economic development is higher. Therefore, in the context of national policies to support the development of enterprises, the level of financial technology development in the country should be improved according to local conditions to extend the survival time of enterprises after IPO, which is conducive to the long-term development of enterprises.

Keywords: Fintech; IPO; Survival Time; Financing Constraints; Transaction Costs; Financial Inclusion.

1. Introduction

With the development of the Internet, Big Data, Blockchain and 5G, fintech has been a hot topic in the financial industry in recent years and has also received extensive attention from world scholars. The global fintech investment and financing market showed an obvious recovery and growth in 2021, with the total amount of investment and financing reaching US$138.8 billion, a record high. The number of global fintech investment and financing deals showed a growing trend. 2,624 global fintech investment and financing deals were recorded in the first half of 2022, an increase of approximately 8% year-on-year [1].

Since 2021, financial regulators in various countries have been strengthening their regulatory policies on risk prevention and control of new technology applications in the financial sector, refining their regulatory policies and clarifying the responsibilities of various aspects such as technology, business and subjects. The "Financial Technology Development Plan (2022-2025)" issued by the People's Bank of China clearly states that steadily developing fintech and accelerating the digital transformation of financial institutions will further promote fintech to enter a new stage of high-quality development, more fully play the enabling role of fintech, and enhance the capability and efficiency of financial services for the real economy.

Then what is the impact of local fintech development on enterprises in the region? How does the development of regional fintech relate to the IPOs of local companies and can it facilitate their growth?

Financial Stability Board (FSB, n.d.) defines FinTech as technologically enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on financial markets, financial institutions and the provision of financial services. An Initial Public Offering (IPO) is when a company sells its shares to the public for the first time.

Papers on fintech and the IPO phenomenon now fall into three categories. The first is a discussion of market recognition of fintech IPOs, the second is about price suppression during fintech IPOs, and the third is the impact of regional economic development levels on fintech IPOs.

Firstly, with regard to market recognition of fintech IPOs, there was a positive reaction on the market reaction to fintech conducting IPOs [2,3]. An impressive overhang of potential fintech-IPOs has been created over the stock market [4].

Secondly, on the issue of price suppression in the IPO process of fintech companies, the phenomenon of price suppression in the IPO of fintech companies is significant, venture capital backing has a significant positive effect on underpricing of FinTech IPOs [5]. For the short term, issues from the fintech industry tend to be more underpriced as the initial first-day returns are significantly higher [6]. Then we document that FinTech IPOs are more underpriced than similar non-FinTech IPOs [7].

Third, regarding the impact of regional economic development level on fintech company IPOs, the number of fintech company IPOs decreases in 2020 because of COVID-19 and an inactive IPO market [8]. The number of fintech startups is higher in countries with developed economies and abundant venture capital [9], thus showing that the level of regional economic development also affects the IPOs of fintech companies.

As can be seen, current scholars have focused on issues related to fintech companies conducting IPOs, with less research on the impact of local spillovers from fintech development on the IPOs of local firms. The aim of this paper is to examine the impact of local fintech development on the IPO of firms.

The innovation of this paper is twofold. Firstly, focusing on the impact of fintech development on the IPO of non-fintech firms achieves thematic innovation and fills a gap. Secondly, we study the heterogeneity of fintech development affecting the IPO of firms according to the industries and the regions they belong to, achieving a content innovation.

2. Hypothesis

IPOs are vital for companies, which determine whether they can expand and grow by going public and raising capital. However, the current IPO process is slow and inefficient, making it difficult for companies to IPO. And with the short survival time of a company after an IPO, there is still a risk of demise. Of the 28,853 companies publicly listed in the US since 1950, 22,469 had died out by 2009, a mortality rate of 77.9% [10]. The development of fintech is now attempting to address the slow process of corporate IPOs and to try to extend the survival time of companies after IPO.

Considering these facts, we propose Hypothesis 1:

Hypothesis 1: The development of fintech can extend the survival time of companies after IPO.

Fintech is regionally heterogeneous. Because of the uneven economic development between eastern China and western and central China, there is often a disparity in the pace of development of some emerging things between the eastern China and the western and central China. The impact of fintech on green growth has obvious regional heterogeneity, that is, the impact in eastern China is significantly stronger than that in western and central China [11]. And also, the impact of fintech on sustainable development in China is also heterogeneous [12]. Therefore, We guess that the impact of fintech developments on the IPO of firms is heterogeneous.

Hence, we propose Hypothesis 2:

Hypothesis 2: The post-IPO survival time of companies in developed eastern China is more influenced by fintech developments than in less developed regions of western and central China.

The impact of fintech on the IPO process can also be influenced by the industry in which the company is located. It is customary to classify the industries in which companies are located according to primary, secondary and tertiary industries. The primary industry refers to agriculture, forestry, animal husbandry and fisheries; the secondary industry refers to mining, manufacturing, electricity, heat, gas and water production and supply, and construction; and the tertiary industry, the service industry, refers to industries other than the primary and secondary industries.

According to the current market situation in China, companies in the tertiary sector, i.e. the service sector, are more susceptible to changes in the external environment during their development. This means that the development of fintech as an emerging technology will have an impact on the environment of each industry. We assume that companies in the tertiary sector are more vulnerable to the impact of fintech development.

Therefore, we propose Hypothesis 3:

Hypothesis 3: Compared with the primary and secondary sectors, the survival time of tertiary sector firms after IPO is more influenced by the development of fintech.

Fintech helps alleviate firms' financing constraints and reduce firms' debt-financing costs [13]. The greater the financing constraint in the area where the business is located, the more difficult it is for the business to obtain financing. As a result, financing constraints make it difficult for companies to obtain sufficient funding. When a company is in a period of financial difficulty, failure to raise finance in a timely manner may result in the demise of the company and shorten its survival time after an IPO.

Therefore, we propose Hypothesis 4:

Hypothesis 4: The financing constraint is a negative mediating mechanism through which fintech affect the survival time of companies after IPO.

The development of financial technology has led to significant breakthroughs in financial products and service models, improving the customer experience while also increasing information exchange and reducing transaction costs [14-15]. Reducing financial transaction costs and improving the efficiency of financial transactions will make it easier for companies to carry out financial activities, facilitate investment and financing activities, and help them grow faster and better, thus helping to extend their survival time to a certain extent.

Based on this, we propose Hypothesis 5:

Hypothesis 5: Transaction costs are a negative mediating mechanism through which fintech affects the survival time of firms after IPO.

Inclusive finance, based on the requirements of equal opportunities and the principle of commercial sustainability, refers to the provision of appropriate and effective financial services at an affordable cost for all social classes and groups in need of financial services [16]. Financial technology innovation has generated beneficial tools for financial inclusion [17], and enterprises, especially SMEs, as one of the service targets of financial inclusion, can enjoy the advantages brought by the development of financial inclusion and obtain more convenient and low-cost financial services, thus benefiting the development of enterprises and extending the life of a company after an IPO.

Therefore, we propose hypothesis 6:

Hypothesis 6: Inclusive finance is a positive mediating mechanism for fintech to influence the survival time of enterprises after IPO.

3. Methodology

3.1 Data

The sample selected for this paper is Chinese A-share listed companies. The data used are mainly listing time data, establishment time data and financial data of A-share listed companies as well as regional fintech development level indicator data.

The data of A-share listed companies are obtained from the Guotaian database (CSMAR); the indicators of the level of fintech development in China's provinces and cities are obtained from the number of results of an advanced search for relevant keywords in Baidu News. The time period of the data is 2005-2021, and the final sample of 4437 company-year observations was obtained.

3.2 Variables

3.2.1 Explanatory Variable

The explanatory variable in this paper is the level of fintech development (*finindex*). A total of 47 keywords for fintech were constructed by extracting five dimensions of fintech: payment and settlement, resource allocation, risk management, information transfer and basic technology, based on the focus on fintech in the China Fintech and Digital Inclusive Finance Development Report (2022), relevant important conferences and documents. The keywords were also matched with all

prefecture-level cities or municipalities directly under the central government in China and the corresponding years. Using web crawler technology, the number of keyword search results for prefecture-level cities or municipalities directly under the central government in the same year were crawled by Baidu News to obtain indicators of the level of financial technology in prefecture-level cities or municipalities directly under the central government.

3.2.2 Explained Variable

The explained variable in this paper is the firm's IPO survival time (*ipoage*). Based on the company's IPO time, the survival time after IPO is measured by the company's current year time minus the company's IPO time, with larger values indicating a longer survival time after IPO and smaller values indicating a shorter survival time after IPO. Also, a larger *ipoage* reflects an earlier IPO and a faster IPO process for the company.

3.2.3 Intermediate Variables

The intermediate variables in this paper are financing constraints (*sa*), transaction costs (*trcost*), and financial inclusion (*infinance*).

Financing constraints:

This paper quantitatively measures financing constraints by using the SA index constructed by Hadlock & Pierce (2010) [18]. The variable sa represents the SA index. The larger the *sa*, the smaller the financing constraint; the smaller the *sa*, the larger the financing constraint.

Transaction costs:

The data for the measurement of regional transaction cost indicators are obtained from data on commercial bank branches at the prefecture-level city level published by the China Banking Regulatory Commission. *trcost* represents the number of financial institutions in each region. The distance between borrowers and financial institutions can affect their transaction costs, so that places with a high number of financial institutions have low transaction costs and places with a low number of financial institutions have high transaction costs [19]. A larger *trcost*, ostensibly a greater number of financial institutions in the region, implies a smaller financial transaction cost for the region; a smaller *trcost*, ostensibly a smaller number of financial institutions in the region, implies a larger financial transaction cost for the region.

Financial Inclusion:

Data for the regional Digital Financial Inclusion Development Index are from The Peking University Digital Financial Inclusion Index of China (PKU-DFIIC) [20]. *infinance* refers to the digital inclusive finance development index of prefecture-level cities. A larger *infinance* indicates a higher level of digital inclusive finance development in the region; a smaller *infinance* indicates a lower level of digital inclusive finance development in the region.

3.2.4 Control Variables

Drawing on the existing literature, this paper controls for common control variables: firm size, firm gearing ratio, net profit margin on total assets, operating income growth rate, whether the firm is loss-making, number of directors, degree of equity checks and balances, proportion of independent directors, and Tobin's Q [21-26].

3.3 Model

To empirically test the impact of fintech development on the survival time of firms after IPO, the following panel fixed effects model was set up:

$$ipoage_{i,t} = \alpha_0 + \alpha_1 finindex_{i,t} + \beta_i \sum_{s=1}^{n} Z_{i,t}^{s} + k_i + \mu_t + \varepsilon_{i,t} \quad (1)$$

where i denotes firm and t denotes year. *ipoage* denotes firm survival time after IPO; *finindex* denotes local level of fintech development; Z denotes control variables, k_i denotes firm fixed effects, μ_t denotes year fixed effects, and $\varepsilon_{i,t}$ are random error terms. The coefficient of *finindex* indicates the extent to which fintech explains the survival time of firms after IPO after excluding time effects.

4. Empirical Analysis

This chapter will analyze the empirical results of all models to test the hypothesis. First is the basic model, second is Heterogeneity test, third is mechanism analysis, fourth is Endogeneity test, and the last is robustness check.

4.1 Basic Model Analysis

Table 1 as below shows the regression results of fixed effect for basic models, within which model (1) exclude control variables and model (2) include control variables.

Table 1. Basic model analysis

	(1)	(2)
	ipoage	ipoage
finindex	2.408***	2.155***
	(690.712)	(401.382)
Control	No	Yes
Individual	Yes	Yes
Time	Yes	Yes
N	41495	36437

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Note: due to missing data for some financial companies and ST companies, model (2) has less sample size than model (1).

Table 1 shows that *finindex* of models (1) and model (2) is significant at the 1% level, and the absolute value is 2.408, which indicates that the development of fintech can extend the post-IPO survival time of firms. The results are still significant after the inclusion of control variables, and the absolute value is 2.155, which proves the hypothesis 1 that the development of fintech can extend the survival time of companies after IPO.

4.2 Heterogeneity Test

Table 2 as below shows the regression results of fixed effect for Heterogeneity test, within which model (1) in eastern regions and model (2) in western and central regions.

Table 2. Results by region

	(1)	(2)
	ipoage	ipoage
finindex	2.176***	2.121***
	(360.161)	(197.320)
Control	Yes	Yes
Individual	Yes	Yes
Time	Yes	Yes
N	25468	10969

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

After controlling for the heterogeneity of different regions, the absolute value of the coefficient in the eastern part of China is greater than that in the western and central regions, which shows that the development of fintech in the eastern region has a greater impact on the survival time of firms after IPO. This confirms hypothesis 2, which states that the post-IPO survival time of companies in developed eastern China is more influenced by fintech developments than in less developed regions of western and central China.

Table 3 as below shows the regression results of fixed effect for different industries, within which model (1) in tertiary sector and model (2) in primary and secondary sectors.

Table 3. Results by industry

	(1)	(2)
	ipoage	ipoage
finindex	2.228***	2.118***
	(234.039)	(325.762)
Control	Yes	Yes
Individual	Yes	Yes
Time	Yes	Yes
N	10709	25728

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

After controlling for the heterogeneity of different industries, the absolute value of the coefficient in the tertiary sector is greater than that in the primary and secondary sectors, which shows that the survival time of tertiary sector firms after IPO is more influenced by the development of fintech. This confirms hypothesis 3, which states that the survival time of tertiary sector firms after IPO is more influenced by the development of fintech, compared with the primary and secondary sectors.

4.3 Mechanism Analysis

For the mechanisms used in this paper to analyze the moderating effects (financing constraints, transaction costs, financial inclusion), the paper further constructs a panel model of the mediating effects as follows:

$$ipoage_{i,t} = \alpha_0 + \alpha_1 Moderator_{i,t} \times finindex_{i,t} + \beta_i \sum_{s=1}^{n} Z_{i,t}^{s} + k_i + \mu_t + \varepsilon_{i,t} \quad (2)$$

where $Moderator_{i,t}$ denotes the intermediate variables (financing constraints, transaction costs, financial inclusion), $Moderator_{i,t} \times finindex_{i,t}$ is the cross product term between the intermediate variables and the core explanatory variables (*finindex*), and other symbols and letters are consistent with equation (1).

Table 4 as below shows the regression results of the Mechanism analysis using the mediating effects panel model, within which model (1) in financing constraints, model (2) in transaction costs and model (3) in financial inclusion.

Table 4. Mechanism analysis

	(1)	(2)	(3)
	ipoage	ipoage	ipoage
finindex×sa	0.372***		
	(175.446)		
finindex×trcost		0.138***	
		(39.019)	
finindex×infinance			0.484***
			(458.051)
Control	Yes	Yes	Yes
Individual	Yes	Yes	Yes
Time	Yes	Yes	Yes
N	30209	34679	26134

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4 demonstrates that all three variables, financing constraint, transaction cost and financial inclusion, are intermediate variables of fintech affecting corporate IPO and are at 1% level of significance.

First, in terms of financing constraints, the coefficient of cross product is 0.372 and at the 1% significance level. The larger the value of *sa*, the smaller the financing constraints on the firm, and the positive correlation between *sa* and *ipoage*, so the effect of financing constraints on the post-IPO survival time of the firm is negative. Therefore, it shows that there is a partial mediating effect of financing constraints, which means that fintech development can influence the survival time after IPO and will extend the survival time after IPO by narrowing the financing constraint of the firm. This supports hypothesis 4, which states that the financing constraint is a negative mediating mechanism through which fintech affects the survival time of companies after IPO.

Secondly, in terms of transaction cost, there exists a probability of more than 99% that the effect on the explained variable *ipoage* is significant and has an impact coefficient of 0.138. the greater the number of financial institutions in a region, the greater the financial transaction cost for firms there; if there are fewer local financial institutions, the smaller the financial transaction cost for firms. *trcost* and *ipoage* have a positive correlation, so the effect of transaction cost on the financial technology to extend the survival time of the firm after IPO is negative. Therefore, it shows that there is a partial mediating effect of transaction costs, which means that the development of fintech can affect the survival time of firms after IPO, and it will prolong the survival time of firms after IPO by reducing their financial transaction costs. This supports hypothesis 5, which states that transaction costs are a negative mediating mechanism through which fintech affects the survival time of firms after IPO.

Thirdly, in terms of financial inclusion, the coefficient of cross product is 0.484 and is at the 1% significance level. The larger the digital inclusive finance development index for a prefecture-level city, the higher the level of digital inclusive finance development in that region; the smaller the digital inclusive finance development index for a prefecture-level city, the lower the level of digital inclusive finance development in that region. *infinance* has a positive correlation with *ipoage*, so the effect of inclusive finance on fintech extending the post-IPO survival time of companies is positive. Hence it shows that there is a partial mediating effect of financial inclusion, which means that fintech development can affect the survival time after IPO and will extend the survival time after IPO by increasing the level of financial inclusion development. This supports hypothesis 6, which states that inclusive finance is a positive mediating mechanism for fintech to influence the survival time of enterprises after IPO.

4.4 Endogeneity Test

The pilot city for fintech development can be used as a natural experiment to overcome the endogeneity issue. If we assume that the policy is exogeneous, we If we assume that the policy is exogeneous, we could view it as a natural experiment and run the DID model: the first time point is 2011, when the experimental group is the first batch of fintech pilot cities selected by the government; the second time point is 2016, when the experimental group is the second batch of fintech pilot cities selected by the government.

The main basic empirical equation is a DID model:

$$ipoage_{i,t} = \alpha + \alpha Pilotyear + \alpha Pilotcity + \alpha Infinindex_{i,t} + \beta_i \sum_{s=1}^{n} Z_{i,t}^{s} + k_i + \mu_t + \varepsilon_{i,t} \quad (3)$$

where *Pilotyear* refers to the year of the pilot (for the first timepoint, if after 2011, set to 1, and otherwise set to 0; for the second timepoint, if after 2016, set to 1, and otherwise set to 0); *Pilotcity* refers to the pilot city, (if the *Pilotcity*, set to 1, otherwise set to 0); *Infinindex* is the cross-product term of *Pilotyear* and *Pilotcity*. Other symbols and letters are consistent with equation (1).

Table 5 as below shows the regression results of fixed effect for Endogeneity test, within which model (1) in no piloting, model (2) in first batch of pilots and model (3) in second batch of pilots.

The results for the first batch of pilot cities (2) show that the cross-product term between fintech development and the first batch of pilot cities is significant at the 1% level, and the absolute value is 3.673 larger than the result when the policy impact is not considered. The results for the second pilot

cities (3) show that the cross multiplier between fintech development and the second pilot cities is significant at the 1% level, and the absolute value is 2.983 larger than the result without policy influence, but smaller than the result for the first pilot cities. This shows that the level of fintech development in policy-supported regions is higher and has a greater impact on corporate IPOs, and that the effect is more pronounced in the first batch of pilot cities than in the second batch of pilot cities.

Table 5. Endogeneity test

	(1)	(2)	(3)
	ipoage	ipoage	ipoage
finindex	2.155***		
	(401.389)		
finindex×first		3.673***	
		(76.806)	
finindex×second			2.983***
			(27.470)
Control	Yes	Yes	Yes
Individual	Yes	Yes	Yes
Time	Yes	Yes	Yes
N	36437	37693	37693

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.5 Robustness Check

4.5.1 Changing the Variables

We can take the robustness check of the results of the previous study by replacing the explained variable.

Set the share of time a firm survives after IPO (*ipoageper*) as a new explained variable:

$$ipoageper = \frac{ipoage}{year-establishment} \tag{4}$$

where *ipoage* is the explained variable in the above, *year* is the time of the company's current year, *establishment* is the time of the company's inception.

Table 6 as below shows the regression results of fixed effect for Robustness check by varying the explained variables, within which model (1) for basic model, model (2) for financing constraints, model (3) for transaction costs and model (4) for financial inclusion.

Table 6. Robustness check 1

	(1)	(2)	(3)	(4)
	ipoageper	ipoageper	ipoageper	ipoageper
finindex	0.040***			
	(92.772)			
finindex×sa		0.636***		
		(54.075)		
finindex×trcost			0.029***	
			(20.881)	
finindex×infinance				0.110***
				(105.847)
Control	Yes	Yes	Yes	Yes
Individual	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
N	36435	30207	34677	26134

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The first robustness check was conducted by replacing the explained variable (*ipoage*) above with *ipoageper*, using the same model as above. Tabel 6 shows that that *finindex* is significant at the 1% level, and the absolute value is 0.04, indicating that fintech development can increase the share of firms' survival time after IPO. Moreover, the three variables of financing constraints, transaction costs and financial inclusion are all intermediate variables for the impact of fintech on firms' IPOs, and are at the 1% level of significance. Therefore, the robustness of the results is tested to a certain extent.

4.5.2 Removing Some of the Data

Table 7 as below shows the regression results of fixed effect for Robustness check by removing some of the data, within which model (1) for basic model, model (2) for financing constraints, model (3) for transaction costs and model (4) for financial inclusion.

Table 7. Robustness check 2

	(1)	(2)	(3)	(4)
	ipoage	ipoage	ipoage	ipoage
finindex	2.156***			
	(401.044)			
finindex×sa		0.365***		
		(174.778)		
finindex×trcost			0.137***	
			(38.696)	
finindex×infinance				0.484***
				(459.500)
Control	Yes	Yes	Yes	Yes
Individual	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
N	36139	30209	34417	25957

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Second, financial firms such as banks and insurance are excluded, data with observation periods less than 3 years are excluded, and all continuous variables below 1% and above 99% are winsorized. Tabel 7 shows that the *finindex* is significant at the 1% level, and the absolute value is 2.156, indicating that fintech development can increase the share of firms surviving time after IPO. Moreover, the three variables of financing constraints, transaction costs and financial inclusion are all intermediate variables for the impact of fintech on firms' IPOs, and are at the 1% level of significance. Therefore, the robustness of the results is tested to a certain extent.

5. Conclusion and Discussion

This paper explores the impact of fintech development in a new context. Through an empirical analysis of data from Chinese A-share listed companies, the impact of regional fintech development on corporate IPOs is investigated, thus providing valuable suggestions for corporate growth. In other studies, the focus is on issues related to the IPOs of fintech companies, but there is less research on the impact of regional spillovers from fintech development on the IPOs of non-fintech companies. Based on this, this paper presents relevant ideas by using fixed panel effect models and natural experiments, as follows:

First, with the development of fintech, firms' post-IPO lifespan is extended, which proves hypothesis 1 that the development of fintech can extend the survival time of firms after IPO. Through robustness tests such as replacing explained variables, excluding financial firm data and winsor, we find that the results are still robust. The implication of hypothesis 1 is that with the development of fintech, it is able to influence local non-financial firms and extend their post-IPO lifespan. Nowadays,

the post-IPO demise rate of firms is high, and the development of fintech is beneficial in reducing the demise of firms and helping them to grow healthily.

Second, due to the uneven economic development in the east and west of China, there is often regional heterogeneity with respect to the development of new and emerging things. Zhou et al. (2022) and Deng et al. (2019) argue that fintech development is regionally heterogeneous in terms of its impact on green growth and sustainable development. Similar to those mentioned earlier, hypothesis 2 separates eastern China from central and western China and conducts separate empirical analyses, and finds that the survival time of firms after IPO in developed eastern regions is more influenced by fintech development than in less developed regions. Thus, it seems that enterprises in the eastern region should focus on applying the results of fintech development, while the government should first use eastern cities as pilot fintech development and also accelerate the development of the central and western regions at a later stage.

Third, similar to Hypothesis 2, the impact of FinTech was tested for heterogeneity across industries through Hypothesis 3. The development of FinTech is more likely to affect the development of the tertiary industry, i.e. the service industry, and it was verified that the survival time of enterprises in the tertiary industry after IPO is more influenced by the development of FinTech compared to the primary and secondary industries. It seems that enterprises in the tertiary sector should pay more attention to the results brought about by the development of financial technology and use it to promote the development of their own enterprises.

Fourth, we need to understand how fintech affects the post-IPO lifespan of firms. Based on Chen and Soon, we understand that the development of fintech can alleviate the financing constraints of firms. By alleviating the financing constraint, firms are more likely to have access to capital at the moment of need, facilitating the resolution of financial difficulties and preventing firms from going bankrupt due to lack of liquidity. Therefore, Hypothesis 4 demonstrates that financing constraints are a mediating mechanism through the use of a mediating effect model, and that fintech affects the survival time of firms after IPO in a negative way.

Fifth, Kou et al. and Feyen et al. argue that the development of fintech increases information exchange and reduces transaction costs. Therefore, the development of fintech improves the efficiency of financial transactions by reducing transaction costs, making it easier for firms to carry out financial activities, which facilitates the growth of firms and thus prolongs their survival time. Similar to earlier, Hypothesis 5 demonstrates that transaction costs are a mediating mechanism through the use of a mediating effects model that fintech affects the survival time of firms after IPO and plays a negative role.

Sixth, the development of financial technology has contributed to the development of inclusive finance. Enterprises can enjoy the advantages brought by the development of inclusive finance, and obtain more convenient and low-cost financial services, which is conducive to the development of enterprises and helps prolong their survival time. Therefore, Hypothesis 6 also uses the mediating effect model to demonstrate that financial inclusion is a mediating mechanism for fintech to affect the survival time of enterprises after IPO, and plays a positive role.

Overall, the empirical analysis shows that the development of financial technology can largely help to extend the survival time of enterprises after IPO. The government should develop financial technology in a large number of ways so that the results of financial technology development can benefit the development and growth of enterprises, while enterprises themselves should actively use the results of financial technology development and follow the trend of financial technology development to help them grow healthily.

The limitation of this paper is that the extension of a firm's life after an IPO cannot be achieved solely through leveraging this aspect of fintech development. However, this paper reports on exploratory research that can be further investigated in depth. Firstly, for the measurement of the explained variables, the paper fails to explore more novel ways of measuring them. Secondly, as corporate IPOs are a dynamic and changing process, there may be dynamic effects involved, which can be verified in the future through the choice of dynamic panel models.

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