The Improvement of Fintechs on the Financing Constrains of SMEs

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***Abstract*—Small and Medium-sized enterprises play a vital role in economic and social development. However, due to the influence of traditional financial development, funding from banks has always been the bottleneck for growth. As a common product of the financial industry and the technology industry, Fintechs through continuous innovation and development, the improvement of the financing channel of SMEs, developing Fintechs has become an effective way to solve this dilemma. However, there are some disadvantages of the research on the behavior of SMEs. Basically, this essay attempts to provide relevant empirical basis and theoretical support for financial institutions and SMEs to make more scientific decisions, which has some theoretical and practical significance. The definition of the core concepts related to financing constraints and the development of Fintechs on the basis of combing relevant domestic and foreign literature. Then analyze the theories related to financing constraints and the development of Fintechs, and put forward the hypothesis of the relationship between the development of Fintechs and financing constraints with the support of relevant theories.**

***Index Terms*—The development of Fintechs, financing constraints, ACW model.**

I. Introduction

Over the past years, The Small and Medium enterprises (SMEs) find it hard to access financing, and the attainable financial resources cannot support the development of some companies in China. The weakness of technological innovation and the mismatching of information cause the financing constraints are widespread. Financial sector at the forefront of the technical innovation, the advance technology such as Big data and artificial intelligence apply to finance, it is enhancing the development of the Fintechs [1]. In the regard, there are a large number of small and medium-size corporations are start-ups, therefore the SMEs need the external financing to expand the business activities [2]. The rapid development of Fintechs expanding the channels for the start-ups to access financing, the job markets and business activities are more buoyant. Recently, there are many discussions of the relationship between Fintechs and financing of SMEs. The basic of the information asymmetry and transaction costs, the proposal of the financing priority theory. It can explain that the priority of financing can be divided as the internal financing, debt financing and the equity financing, because the cost of external financing is higher than others, and the equity financing will affect the negative information of the operation, it is also one of the reasons for the financing constraints [3]. The advantages of the e-finance including the decreasing the transaction cost, expanding the scope of the information in financing system and improving the efficiency of the information, the development of technology enhances the increasing of the financing channels. This paper uses the ACW model to test the improvement of financing constrains related to the progress of the Fintechs [4].

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II. Methodology

A. The Selection of Model

The essay selected the quarterly data of IPO firms over the period 2010-2020 as the sample data, the collection of the data from the Wind database. Based on the above review and theoretical analysis, the paper proposes the following hypotheses:

H_1: The development of Fintech is conductive to easing the financing constraints of small and medium-sized enterprises.

B. The Specification of Model and the Definition of Variables

1) The specification of model

There are some weakness of the FHP model and the improvement of this model is the ACW model by modifying the Cash flow-sensitivity [5]. The financial constraint and a company's demand for liquidity benefit to identify whether the financial constraint influence the corporate behavior. The company will increase the cash reserves to deal with the financial constraint, as result of the holding cost and opportunity cost of investment rising. The model is expressed as follows:

$$\text{cash}_{it} = \alpha_0 + \alpha_1 cf_{it} + \alpha_2 \text{size}_{it} + \alpha_3 da_{it} + \alpha_4 nwc_{it} + \alpha_5 grow_{it} + \alpha_6 expend_{it} + \varepsilon_{it}$$

where α_i is the estimate of the financial constraint, ε is the residual value. In order to verify the hypothesis H_1, adding the interaction term of enterprise cash flow and the development level of Fintech (FD), an extended equation is constructed:

$$\text{cash}_{it} = \alpha_0 + \alpha_1 CF_{it} + \alpha_2 size_{it} + \alpha_3 da_{it} + \alpha_4 nwc_{it} + \alpha_5 grow_{it} + \alpha_6 expend_{it} + \alpha_7 FD_{i\tau} + \varepsilon_{it}$$

FD represents the development index of the Fintechs, if the hypothesis H_1 is true, the Fintechs can relieve the financial constraints.

2) Definition of variables

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TABLE I: VARIABLE DECLARATION

Variable type	Variable	Variable name	Defination
Explained variable	cash	Cash reserves	the increasing value of cash or cash equivalent /beginning Total Assets
	cf	Cash flow	the cash flow of operating / beginning Total Assets
core explantory vatiable	fd	the development index of Fintech	Multiply the enterprise cash flow index with the Internet finance development level index to construct the interaction item
	as	Information mismatch	Ending intangible assets/Ending total assets
other varible	ac	agency cost	current management sales /current sales return
	size	the size of corporation	the natural logarithm of ending total assets
	da	debt-to-asset ratio	Total Liability / Total Asset
Control variable	nwc	net working capital	(current Asset-current Liability)/beginning total Assets
	grow	growth	Tobin variable Q= Market value/ ending total Assets
	expend	The capital expenditure	Long-run capital expenditure/ beginning total Assets

3) The index designs

TABLE II: CORRELATION COEFFICIENT MATRIX

	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**
x1	1	.759*	.105	.095	.114	-.195	-.084
x2	.759*	1	.040	.014	.001	-.294	-.093
x3	.105	.040	1	.997**	.996**	-.949**	.973**
x4	.095	.014	.997**	1	.998**	-.938**	.978**
x5	.114	.001	.996**	.998**	1	-.926**	.972**
x6	-.195	-.294	-.949**	-.938**	-.926**	1	-.918**
x7	-.084	-.093	.973**	.978**	.972**	-.918**	1

The correlation between X3-X4, X5 -X4 is large obviously, and there is relatively large correlation among all the variables, so the principal component analysis is efficient.

The results of principal component analysis are shown in Table 3. The characteristic roots of the first two principal components are both greater than 1, and variance is 95.483%, which can include a large amount of information. Therefore, the first two principal components can be used to represent the development level of Fintechs, and selected F1 and F2 as principal components.

TABLE III: THE EXPLANATORY OF TOTAL VARIANCE

elements			Extraction Sums of Squared Loadings			Sum of squares of rotating load		
	Variance %	Cumulative %	Total	Variance %	Cumulative %	total	Variance %	Cumulative %
1	69.627	69.627	4.874	69.627	69.627	4.854	69.343	69.343
2	25.856	95.483	1.810	25.856	95.483	1.830	26.140	95.483
3	4.263	99.746						
4	.136	99.883						
5	.093	99.975						
6	.025	100.000						

The formula of principal components F_1 and F_2 is obtained:

F_1= 0.057X_1+0.040X_2+0.452 X_3+0.451 X_4+0.449 X_5-0.438 X_6+0.441 X_7

F_2= 0.685 X_1+0.699 X_2-0.023 X_3-0.042 X_4-0.041 X_5-0.116 X_6-0.154 X_7

The weighted average of the contribution rate of the two principal components is carried out to obtain the comprehensive index of Fintech development level. The formula is:

F= (F1*69.63%+F2*25.86%)/95.48%

TABLE IV: FINTECHS DEVELOPMENT INDEX

time	Prin1	Prin2	aggregative	FD
2011	-2.22	-2.55	-2.31	0.00
2012	-2.23	-0.99	-1.89	0.09
2013	-2.44	0.15	-1.74	0.12
2014	-1.74	0.99	-1.00	0.29
2015	-0.74	1.82	-0.05	0.50
2016	0.22	1.45	0.55	0.63
2017	1.05	0.78	0.97	0.72
2018	1.87	0.12	1.40	0.81
2019	2.70	-0.55	1.82	0.91
2020	3.53	-1.22	2.24	1.00

This paper standardized the comprehensive indicators to obtain the index of FD (Fintech development level) over the period of 2010-2020. In general, there are rapid development of the Fintechs recently in China.

C. Analysis

1) Descriptive statistics

TABLE V: DESCRIPTIVE STATISTICS

Variable	Obs	Mean	Std.Dev.	Min	Max
cash	6960	0.1970	0.1400	0	0.9251
cf	6960	0.0497	0.0752	-0.7620	0.5332
as	6960	0.0449	0.0408	0	0.6240
ac	6960	11.1700	12.6211	0.3711	728.4001
size	6960	21.9900	1.083	18.2801	28.1200
da	6960	39.4700	20.0301	0.7522	268.0001
nwc	6960	0.2540	0.2292	-1.5121	0.9631
grow	6960	1.3980	1.6070	0	34.1423
expend	6960	0.0535	0.0545	-0.3791	0.6421
fd	6960	61.6300	116.1002	-1200.0000	1232.0012

The sample size is 6960, and there a large number of differences in the descriptive statistics, for example, the maximum value of the agency cost(ac) is 728.4001 and the minimum value is 0.3711, the maximum value of development index of Fintechs(fd) is 1232.0012, and the minimum value is -1200. Otherwise, there is a large difference between mean value and standard deviation of the

variable size. It can be seen that there is a high volatility between the ability of operating and the expected development of the SMEs. However, the standard deviation of cash flow(cf) and information mismatch(as) are very small, it is stable during the development of Fintechs and there are some financing constraints.

D. Results

1) Regression results

Firstly, this essay determines whether the model is a random effects model or a fixed effects model by using the F-test. The result of Hausmann test is p = 0.000 and the null hypothesis is rejected at the confidence level of 5%, so the fixed effects model should be selected. The regression results are shown in the table:

TABLE VI: The Results of Regression

	(1)	(2)
VARIABLES	Column 1	Column 2
cf	0.17434***	0.33837***
	(0.025)	(0.037)
as	-0.13264**	-0.12738**
	(0.056)	(0.054)
ac	0.00060***	0.00062***
	(0.000)	(0.000)
size	-0.00048	-0.00065
	(0.004)	(0.004)
da	0.00229***	0.00213***
	(0.000)	(0.000)
nwc	0.56311***	0.55250***
	(0.022)	(0.021)
grow	-0.00503***	-0.00301**
	(0.001)	(0.001)
expend	0.04117	0.01335
	(0.028)	(0.028)
fd		-0.00015***
		(0.000)
Constant	-0.03062	-0.01831
	(0.083)	(0.079)
Observations	6,960	6,960
R-squared	0.416	0.429
Number of ID	696	696

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The estimated coefficients of cf are all positive and significant at the level of 1%, which can prove that SMEs have some financial constraint. And the coefficients of the net working capital are significant positive, it indicates that the increasing of the cash holdings as the net working capital rises. Otherwise, the coefficient of the fd variable, it is negative and significant at the level of 1%, this shows that the development of the Fintechs can reduce the dependency of the internal cash flows, it also alleviates financing constraints to a certain extent. The Fintechs rely on the Big data and Cloud computation, it can solve the problem of information asymmetry and improve the efficient of financing.

2) Robustness

This essay uses the multi-linear regression to test the moderate of the result, and the quantity of the p2p platform as the variable fd, the result shown in the table 7. It can be seen that previous analysis is still valid, the coefficient of the cf is significantly positive, and there are financing constraints. In addition, the coefficient of the fd is significant negative at the level of 1%, this illustrates the development of the Fintechs is benefit to solve the financing problem of Small and medium enterprises. In conclusion, the empirical results of this paper are robust.

TABLE VII: ROBUSTNESS TEST

	(1)	(2)
VARIABLES	Column 1	Column 2
cf	0.29343***	0.48529***
	(0.029)	(0.045)
as	-0.17909***	-0.17980***
	(0.031)	(0.031)
ac	0.00203**	0.00201**
	(0.001)	(0.001)
size	-0.00160	-0.00046
	(0.002)	(0.002)
da	0.00103***	0.00094***
	(0.000)	(0.000)
nwc	0.38045***	0.37400***
	(0.010)	(0.010)
grow	-0.00211*	-0.00122
	(0.001)	(0.001)
expend	0.07823**	0.05588
	(0.036)	(0.036)
fd		-0.00017***
		(0.000)
Constant	0.06431*	0.04550
	(0.037)	(0.036)
Observations	6,960	6,960
R-squared	0.333	0.343

Robust standard errors in parentheses , *** $p<0.01$, ** $p<0.05$, * $p<0.1$

III. DISCUSSION

The channel of Small and Medium-sized enterprises has increased by Fintechs, it is essential to improve the corporation social responsibility. The difference between the large corporations and the SMEs is not only in scale, but also in internal system construction. SMEs should establish the self-discipline mechanism, construct the social investment and financial system, it can reduce the moral hazard caused by information asymmetry [6]. The state-owned corporations are easy to finance in the Chinese financial market, due to the lack of government guarantee and the support of policies, it is difficult for SMEs to obtain financing, and the financing constraints are influenced by the tightness of liquidity [7]. Especially the problem of information asymmetry for the private enterprises causes the cost of financing increases. The state-owned corporations have large capital needs, the characters of Fintechs are flexible and small size, there are matching for the SMEs with high frequency and small capital demand.

Furthermore, there are some advices for obtaining financing for the SMEs. Firstly, the government need to encourage the development of Fintechs, and improve the external financing environment. Some Fintechs based on the traditional banking sector, paying more attention about the cooperation, services and safety, it is different from many private corporations of Fintech [8]. It is important to standardize the development path of Fintech and enable the Fintech industry in China to develop vigorously in a healthy and orderly way. Secondly, the strengthen of the Fintech industry in legally and amplify the supervision of laws and regulations. The government should improve the market access system of Fintechs and establish an controllable level of exposure of the financial system, it is benefit to increase the security and credibility of the Small and Medium-sized enterprises to access financing by the Fintech platform [9].

Finally, the SMEs should change the cognition of the financing ways. It is necessary to reduce the dependence of the bank loan and improve the financing activities, such as taking advantage of many kinds of financing channels and improving the utilization efficiency of funds, to obtain the opportunities to make more profits.

IV. Conclusion

To sum up, the financing problems of SMEs are significantly related to the development level of Fintechs. At present, small and medium-sized enterprises still have financing constraints, which are fundamentally related to the development lag of the capital market, and the operation mechanism and hierarchical structure of the financial market are not perfect. At the same time, small scale, poor economic strength, lack of competitiveness and low credit level of small and medium-sized enterprises aggravate the problem of information asymmetry. Due to moral hazard, banks and other financial institutions are often not willing to provide financial support. Therefore, in order to solve the financing constraints effectively, it is necessary to increase the financing channels of small and medium-sized enterprises.

Conflict of Interest

The author declares no conflict of interest".

Author Contributions

Yue WU conducted the research, analyzed the data, wrote the paper. The Author had pproved the final version.

References

[1] R. Huang, X. Lai, and S. Tang, "How does Fintech affect corporate financing constraints," *Journal of International Finance and Research*, 2020, vol. 6, pp. 25-33.

[2] D. Salerno, G. Sampagnaro, and V. Verdoliva, "Fintech and IPO underpricing: An explorative study," *Finance Research Letters*, p. 102071, 2021.

[3] S. C. Myers and N. S. Majluf, "Corporate financing and investment decisions when firms have information that investors do not have," *Social Science Electronic Publishing*, 1984, vol. 13, no. 2, pp. 187-221.

[4] M. Shahorkhi, "E-finance: Status, innovations, resources and future challenges," *Managerial Finance*, vol. 34, no. 5, pp. 365-398, 2008.

[5] H. Almeida, M. Campello, and M. S. Weisbach, "The cash flow sensitivity of cash," *Journal of Finance*, 2004, vol. 59, no. 4, pp. 1777-1803

[6] L. Xu and G. Tao, "Can the development of internet finance solve the financing dilemma of Small and medium-sized enterprises in China?" *Finance of Wuhan*, pp. 39-43, 2019.

[7] D. Cai and W. Kong, "Measure the influence of Internet finance development on enterprise financing constraints," *Journal of Jilin Business and Technology College*, 2020, vol. 36, no. 05, pp. 58-97.

[8] L. Laidroo *et al*., "Business models of FinTechs – Difference in similarity?" *Electronic Commerce Research and Applications*, vol. 46, p. 101034, 2021.

[9] J. Dong, L. Yin, X. Liu *et al*., "Impact of internet finance on the performance of commercial banks in China," *International Review of Financial Analysis*, 2020, vol. 72, no. 1, pp. 1-7.

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