

Research on The Inhibitory Effect of Excessive Financialization on Manufacturing Productivity

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Abstract: This paper takes A-share manufacturing listed companies from 2008 to 2014 as the research object, and investigates the influence of financialization on total factor productivity of manufacturing enterprises. The results show that financialization can significantly inhibit the improvement of total factor productivity in manufacturing industry. The research of this paper provides micro-evidence for the influence of financialization on total factor productivity, and also provides policy enlightenment for guiding funds to "break away from reality to emptiness".

Keywords: Enterprise financialization, Total factor productivity.

1. Introduction and Literature Review

The report of the 19th National Congress of the Communist Party of China pointed out that China's economy has entered a high-quality development stage from a high-speed growth stage. The foundation of high-quality development lies in the vitality, innovation and competitiveness of the economy. High-quality development should be based on the improvement of production factors, productivity and total factor efficiency. Building a modern economic system is an urgent requirement to cross the threshold and a strategic goal of China's development[1]. To achieve this goal, we must adhere to quality first and benefit first, improve total factor productivity, and constantly enhance China's innovation and competitiveness. Manufacturing is the pillar industry of the national economy, and the real economy represented by manufacturing is the foundation of our country, the instrument of rejuvenating the country and the foundation of strengthening the country. However, there is a certain gap between its production efficiency and the advanced level in the world[2]. Therefore, the decisive role of total factor productivity is becoming more and more important from the perspective of promoting China's economic transformation and upgrading, or from the perspective of moving from a "manufacturing power" to a "manufacturing power".

During the 13th collective study in the Political Bureau of the Communist Party of China (CPC) Central Committee, Secretary Xi Jinping emphasized deepening the structural reform of the financial supply side and enhancing the ability of financial services to the real economy. However, under the background of virtual world economy and high return of financial capital, economic financialization has become a major trend of economic development in various countries. In recent years, the development goals of more and more entity enterprises, especially manufacturing enterprises, have shifted to the financial field, which not only weakens the willingness of enterprises to expand reproduction and innovation, but also reduces the investment in equipment renewal and R&D innovation, and is detrimental to the long-term development of enterprises, thus restricting the improvement of their total factor productivity[3]. Total factor productivity (TFP) is an important factor affecting the sustainable development of enterprises, and it is also an important embodiment of the core competitiveness of

enterprises. Under this background, is there a close relationship between financialization and TFP of manufacturing enterprises in China? What is the degree and trend of financial influence on total factor productivity? These questions need to be studied and answered urgently.

2. Data Processing and Model Setting

2.1. Samples and Data Sources

The research samples of this paper are from A-share manufacturing listed companies in Shanghai and Shenzhen stock markets, and the sample span is from 2008 to 2018. Because the explained variable TFP is the next data in the regression, the data involved in calculating TFP is from 2009 to 2019[4]. After data collection, the samples were screened according to the following steps:①Exclude ST, *ST and PT listed companies; ② Eliminate listed companies that issue H shares, N shares or B shares at the same time; ③ Eliminate the companies listed in the current year, i.e. IPO; (4) Exclude listed companies with major asset restructuring and mergers and acquisitions in that year;⑤Eliminate listed companies with missing data[5]. The sample data comes from three authoritative databases of CSMAR, WIND and CCER in China, and is cross-checked according to different database information to ensure the accuracy of the data. For the missing data, it is supplemented by searching the annual reports of listed companies.

2.2. Variable Measurement

(1) Explained variable: the explained variable of this paper is the total factor productivity (TFP) of enterprises. Based on Giannetti et al.(2015)'s estimation method of TFP, this paper estimates the total factor productivity of listed companies in manufacturing industry by using Cobb-Douglas production function through Solo residual method. The specific formula for estimation is:

$$Y_{it} = A_{it} L_{it}^{\alpha} K_{it}^{\beta} \quad (1)$$

Among them, Y_{it} , L_{it} , K_{it} denote the firm's output, labor input and capital input, A_{it} , which is total factor

productivity (TFP) in addition to labor and capital, is transformed into a linear form by taking the logarithm of both ends of equation (1)

$$y_{it} = \alpha l_{it} + \beta k_{it} + \mu_{it} \quad (2)$$

In formula (2), y_{it} is the output of enterprise I in the t year, expressed by the natural logarithm of the main business income; l_{it} is the labor input of the enterprise in t years, expressed by the natural logarithm of the total number of employees in the enterprise; k_{it} is the capital investment of the enterprise in t year, that is, the capital expenditure of the enterprise in that year. OLS estimation is performed on formula (2), the resulting residual μ_{it} is the total factor productivity. As this total factor productivity is estimated by OLS regression, it is expressed by TFP_OLS.

Based on the practice of Cheng Chen (2017), this paper uses LP method to estimate TFP_LP, and takes TFP_OLS, which is obtained by conventional methods, as the explained variable of estimation and analysis[6].

(2) Explanatory variable: The explanatory variable in this paper is the degree of enterprise financialization (Fin). Using Demir's (2009) approach for reference, the ratio of financial assets held by enterprises to total assets is taken as an index to characterize the degree of financialization; According to the research ideas of Du Yong et al. (2017), transactional financial assets, net loans and advances, derivative financial assets, net available-for-sale financial assets, and net held-to-

maturity investments are all included in the category of financial assets. In addition, in contemporary China, the real estate industry is far away from the real sector and has a high degree of virtualization characteristics (Song Jun and Lu Yang, 2015), so it is included in the measurement of corporate financialization. The specific calculation formula of financial degree (Fin) of enterprises is:

$$Fin = \frac{\text{Trading financial assets} + \text{net loans and advances} + \text{derivative financial assets} + \text{net available-for-sale financial assets} + \text{net held-to-maturity investment} + \text{net investment real estate}}{\text{total assets}} [7].$$

(3) Control variables: A large number of existing studies believe that factors such as company characteristics will significantly affect total factor productivity. Therefore, this paper considers and sets the following control variables: enterprise Size, expressed by the logarithm of total assets of the enterprise; Enterprise debt ratio (Lev), expressed by the ratio of total liabilities to total assets; Profitability (Roa), expressed by the rate of return on total assets of the enterprise; Growth, expressed by Tobin Q; Cash level, expressed by the ratio of cash flow from operating activities to total assets; Institutional investors' shareholding ratio (Ins), expressed by the proportion of institutional shares to the total share capital; Indep, expressed by the ratio of the number of independent directors to the total number of directors; Age of an enterprise, expressed by the number of years since its listing. In addition, this paper also uses Industry to represent the fixed effect of the industry to control the differences at the industry level; Year represents the fixed effect of time, which is used to control the impact of time factors on TFP of enterprises[8].

See Table 1 for the specific settings of each variable.

Table 1. Variable definition and calculation method

Variables	Variable name	Variable code	Variable measure	
Explained variable	Total factor productivity (OLS method)	TFP_OLS	Calculated by OLS method	
	Total factor productivity (LP method)	TFP_LP	Calculated by LP method	
Explanatory variable	Enterprise financialization degree	Fin	(Trading financial assets+net loans and advances+derivative financial assets+net available-for-sale financial assets+net held-to-maturity investment+net investment real estate)/total assets	
	Scale	Size	Natural logarithmic value of total assets of an enterprise	
	Enterprise debt ratio	Lev	Total liabilities/total assets	
	Enterprise profitability	Roa	Rate of return on total assets	
	Enterprise growth ability	Growth	Tobin q value of enterprise	
	Control variable	Enterprise cash holding level	Cash	Operating cash flow/total assets
		Share holding ratio of institutional investors	Ins	Number of institutional shares/total share capital
Proportion of independent directors		Indep	Number of independent directors/total number of directors	
Enterprise listing period		Age	The difference between the current year and the year of listing	

2.3. Measurement Model Setting

In order to verify the impact of corporate financialization on total factor productivity, the basic test model of this paper is set as follows:

$$TFP_{it+1} = \alpha_0 + \alpha_1 Fin_{it} + \alpha_2 Controls_{it} + \sum Industry + \sum Year + \varepsilon_{it+1} \quad (3)$$

Among them, TFP_{it+1} is the total factor productivity of enterprise i in t+1 year, Fin_{it} is the financialization degree of enterprise i in t year, $Controls$ is all control variables, $\sum Industry$ and $\sum Year$ are the fixed effects of industry

and time, respectively, ε_{it+1} is the random interference items.

In order to further verify whether corporate financialization has a "U" or inverted "U" impact on total factor productivity, this paper adds the square term of corporate financialization on the basis of formula (4). The specific model is:

$$TFP_{it+1} = \alpha_0 + \alpha_1 Fin_{it} + \alpha_2 Fin_{it}^2 + \alpha_3 Controls_{it} + \sum Industry + \sum Year + \varepsilon_{it+1} \quad (4)$$

Table 2. Descriptive statistics of main variables

variable	observed value	average/mean value	median	standard deviation	maximum	minimum value
TFP_OLS	6257	0.0021	-0.0083	0.2678	0.7840	-0.6982
TFP_LP	6257	13.1953	13.1261	0.8275	15.4556	11.2675
Fin	6257	0.0151	0.0002	0.0424	0.3263	0
Size	6257	21.6512	21.5335	1.0359	24.8994	19.2439
Lev	6257	0.4157	0.4074	0.2107	0.9454	0.0454
Roa	6257	0.0624	0.0558	0.0611	0.2781	-0.1295
Growth	6257	1.9516	1.5935	1.4530	8.2346	0.2371
Cash	6257	0.0433	0.0413	0.0685	0.2417	-0.1510
Ins	6257	0.0607	0.0342	0.0864	0.5204	0
Indep	6257	0.3686	0.3333	0.0508	0.5714	0.3000
Age	6257	7.5618	six	5.4174	22	one

3.2. Regression Results of Benchmark Model

Using Stata15.0 statistical software, OLS mixed regression is carried out on formula (3), and the industry effect and year effect are added to control[9], so that the correlation coefficient between enterprise financialization of explanatory variables and total factor productivity of explained variables can be obtained, and the influence of financialization on TFP

3. Empirical Results and Discussion

3.1. Descriptive Statistics

The descriptive statistical results of each control variable are shown in Table 2. Generally speaking, each control variable in the sample index has the characteristics of great differences.

can be verified. In order to further investigate whether the Financialization of enterprises has a nonlinear effect on total factor productivity, according to formula (4), the square term of financialization fin is added for OLS mixed regression[10], and the influence of financialization and its square term on TFP is obtained. The specific regression results are shown in Table 3.

Table 3. Benchmark regression results of the impact of corporate financialization on total factor productivity

variable	TFP_OLS			TFP_LP		
	(1)	(2)	(3)	(4)	(5)	(6)
Fin	-0.5736*** (-6.53)	-0.5488*** (-6.50)	-0.0301*** (-0.15)	-0.2313** (-0.96)	-0.1146** (-0.65)	-1.1515*** (-3.43)
Fin2	/	/	-2.2082 (-2.61)	/	/	-6.9404 (-3.97)
Size	/	-0.0233*** (-4.94)	-0.0232*** (-4.94)	/	-0.5099*** (-52.49)	-0.5102*** (-52.76)
Lev	/	-0.1011*** (-4.32)	-0.1027*** (-4.41)	/	-0.4187*** (-8.53)	-0.4233*** (-8.68)
Roa	/	1.2480*** (15.71)	1.2494*** (15.79)	/	2.9692*** (17.22)	2.9738*** (17.31)
Growth	/	-0.0010 (-0.30)	-0.0007 (-0.21)	/	-0.0113 (-1.59)	-0.0104 (-1.46)
Cash	/	0.9250*** (16.51)	0.9215*** (16.49)	/	0.3026** (2.44)	0.2917** (2.36)
Ins	/	0.2237*** (5.76)	0.2255*** (5.82)	/	0.0547* (0.66)	0.0603* (0.74)
Indep	/	-0.1788*** (-3.12)	-0.1752*** (-3.06)	/	0.0645 (0.51)	0.0758 (0.60)
Age	/	0.0036*** (4.69)	0.0034*** (4.30)	/	0.0071*** (4.51)	0.0062*** (3.93)
constant term	-0.0424** (-1.96)	0.2833*** (2.93)	0.2787*** (2.88)	13.5468*** (155.09)	2.1317*** (10.35)	2.1171*** (10.31)
industry	control	control	control	control	control	control
time	control	control	control	control	control	control
observed value	6257	6257	6257	6257	6257	6257
R2	0.0302	0.2040	0.2051	0.1249	0.6517	0.6529
variance ratio	6.55***	37.16***	36.59***	24.17***	293.39***	289.58***

Note: (1)*, **, *** means passing the test at the significance level of 10%, 5% and 1% respectively; (2) Robust T value in brackets.

The coefficients of *Fin* in column (1) and column (4) are significantly negative at the level of 1% and 5% respectively, indicating that financialization will have a negative effect on the improvement of total factor productivity of enterprises without adding control variables. After adding control variables, the coefficients of *Fin* in the second and fifth columns are -0.5488 and -0.1146, which are significantly negative at the levels of 1% and 5%, respectively. This means that the higher the degree of financialization of manufacturing enterprises in China, the more restricted the improvement of total factor productivity.

Columns (3) and (6) mainly examine whether financialization has a nonlinear impact on TFP of enterprises. Therefore, the square term of financialization degree is introduced into regression equation (5) and tested. Columns (3) and (6) show that the result of financialization *Fin* is still significantly negative, but the coefficient of its square term *Fin*² is not significant, whether it is TFP calculated by OLS method or TFP calculated by LP method. This shows that there is not enough evidence to show that there is a nonlinear relationship between financialization and total factor productivity of listed manufacturing companies in China.

4. Conclusion and Enlightenment

Based on the panel data of China's A-share manufacturing listed companies from 2008 to 2018, this paper empirically studies the impact of corporate financialization on total factor productivity. It is found that there is no nonlinear relationship between financialization of manufacturing enterprises and total factor productivity. Whether or not the square term is added, the impact of financialization on total factor productivity is significantly negative, that is, the higher the degree of financialization, the more unfavorable it is to the improvement of total factor productivity.

According to the research conclusion of this paper, it can be found that although financialization has inhibited the total factor productivity of manufacturing industry, it does not mean that the allocation of financial assets by entity enterprises should be completely denied[11]. Through policy guidance, manufacturing enterprises should abandon the concept of market arbitrage, position the allocation of financial assets in terms of capital reserves, and truly regard financialization as an important guarantee for R&D innovation and technological progress. Specifically, we should start from the following three points: First, curb asset bubbles and reduce the excess rate of return of the virtual economy[12]. In the final analysis, the reason why enterprises apply a large amount of capital to financial operations is that the virtual economy is attracted by the excess returns, and the distortion of returns among different industries is the key factor of over-financialization. The government should crack down on speculation by strengthening the degree and increasing the frequency of financial supervision. At the same time, house prices should be strictly controlled to avoid a large amount of physical capital entering the real estate sector. By reducing the rate of return of the virtual economy, a large number of manufacturing enterprises can "pull out" from the allocation of financial assets arbitrage in the market. Second, strengthen the innovation atmosphere and improve the return rate of physical investment. Governments at all levels should

create a good atmosphere and environment for innovation, guide enterprises to increase market competitiveness through technological innovation, improve total factor productivity, and reduce the attractiveness of financial investment to enterprises.

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