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Political Connections, Financial Constraints and Long-term Growth

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Abstract

This paper takes Chinese private listed companies as a sample to study the impact of political connections on financial constraints and long-term growth. The study found that political connections can help companies ease financial constraints and help companies to enlarge scale. However, the easing of financial constraints has not helped companies to improve their innovation capabilities and operating efficiency. On the contrary, political connections have caused a decline in companies' potential long-term growth.

JEL classification numbers: D92, P16
Keywords: Political connections, Private listed company, Financial constraints, Long-term growth

1. Introduction

China's economic growth rate is 6.6% in 2018. Since 2010, China's GDP growth rate has declined continuously. The future development of the China's economy depends to a large extent on whether the companies can maintain high operating efficiency in the long-run. As the representative of high-efficiency productivity, private enterprises are the important force to support the sustained and rapid growth of China's economy. Their development plays an important role in improving China's independent innovation ability and promoting China's economic transformation.

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However, the development of China's private enterprises is facing a severe challenge. Since the reform and opening-up, the development of China's factor market is still seriously lagging behind. National departments and government agencies continue to play a decisive and dominant role in the allocation of resources, particularly in financial resources and marketing opportunities. In such a discriminatory allocation system, private enterprises cannot access to economic resources commensurate with their productivity. As a result, more and more private companies are focusing on political connections with government officials.

The connections between enterprises and political entity has brought complicated and far-reaching effects. On the one hand, with the help of political connections, private enterprises can quickly obtain the resources needed for production and operation, which helps them achieve rapid development. However, on the other hand, as a result of obtaining resources simpler and quicker, enterprises no longer focus on management, leading to the decrease of operating efficiency and long-term growth potential.

Although the establishment of political connections is helpful for enterprises to acquire resources and become bigger in scale and stronger in a short term, change in decision making mode has caused potential harm to the operating efficiency and growth potential by political connections. This has become a major institutional hidden danger in China's economy. This paper analyzes the relieving effect of political connections on financial constraints of enterprises, thus to prove that political connections can help enterprises to expand rapidly. On this basis, the paper provides a feasible micro perspective for understanding the informal mechanism such as political connections in China's economic system by analyzing the influence of political connections on the long-term growth of enterprises.

The remaining section of this paper is as follows: Section II is literature review, which mainly elaborates the research conclusions and comments on political connections, financial constraints and enterprise value. Section III is the data source and the variable design, briefly introduces each variable used in this paper and the data acquisition method; Section IV is the basic analysis, focusing on the analysis of political connections to ease the financial constraints of enterprises, and its help to the expansion of enterprise scale; Section V is robustness analysis, testing the conclusions obtained in the basic analysis. Section VI is mechanism analysis, which analyzes the influence of political connections on the long-term growth potential of enterprises. Section VII summarizes the conclusion and puts forward policy suggestions.

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2. Literature Review

2.1 Political Connections

The phenomenon of political connections, which exists widely in the world, has obtained abundant research results. At present, academic research focuses on direct benefits brought by political connections to enterprises, such as government subsidies (Faccio et al., 2006), tax incentives (Adhikari et al., 2006) and financing facilities (Khwaja and Mian, 2005; Claessens et al. 2008). Some studies also focus on the impact of political connections on enterprise value (Fisman, 2001; Johnson and Mitton, 2003; Knight, 2006; Faccio and Parsley, 2009), operating efficiency and innovation level.

Faccio et al. (2006) first analyzed the impact of political association. Using a sample of 47 countries, the paper shows that widespread political connections can lead to more government subsidies, industry barriers and enterprise value. The paper also showed that increased supervision on government officials would significantly reduce those benefits. Adhikari et al. (2006) used Malaysian enterprises as samples and found that the effective tax rate of enterprises with political connections was significantly lower than that of non-connected enterprises. Mobarak and Purbasari (2006), using samples from Indonesia, found that political connections helped connected enterprises get help to enter regulated industries.

Studies using Chinese samples have reached similar conclusions. Pan et al. (2009) found that political connections can help enterprises get government subsidies. Yu et al. (2010) not only found that connected enterprises could get subsidies, but also found that the worse the institutional environment where the enterprises were located, the stronger the subsidy acquisition effect of political connections. Wu et al. (2009) found that the effective tax rate of political connected enterprises was significantly lower than that of non- connected enterprises in provinces and cities with heavy burden of corporate tax. What's more, the heavier the burden of corporate tax in the provinces and cities where the enterprises are located, the more preferential tax treatment for connected enterprises.

In addition to government subsidies and tax incentives, much research has focused on the ease of financial constraints that political connections bring. Khwaja and Mian (2005), based on the study of Pakistani enterprises, concluded that even if the loan default rate of non-connected enterprises is lower, state-owned banks would still significantly favor enterprises with political connections in loan activities. Claessens et al. (2008) studied Brazilian enterprises as a sample and found that after each election, all connected enterprises obtained financing facilities from banks. Charumilind et al. (2006), found that connected enterprises could obtain more long-term credit with less collateral, taking Thai enterprises as a sample. In studies based on Chinese enterprises, Bai et al. (2006), Yu and Pan (2008), Luo and Zhen (2008), Yu et al. (2012) and Firth et al. (2009) all found that political connections can help related enterprises obtain financing facilities.

Besides benefits, a great deal of research has focused on the indirect effects of political connections, but no consensus has been reached. For example, in terms of

political connections and enterprise value, Fishman (2001), Johnson and Mitton (2003), Jayachandran (2006), Knight (2006), Claessens et al. (2008) and other scholars concluded that the existence of political connections could help improve enterprise value, taking the United States, Brazil, Thailand, Indonesia and other countries as samples. However, studies of Fisman et al. (2006), Bertrand et al. (2007) and Faccio (2007) in several other countries have reached that political connections do not significantly change corporate performance.

In respect of enterprise operation and management, studies have not yet to reach a uniform conclusion. Faccio and Parsley (2009), found that when political figures with political connections with enterprises suddenly died, the stock price and sales growth rate of enterprises would decrease significantly, based on the study of transnational samples. Dombrovsky (2010,2011) found that the existence of political connections could significantly improve the sales of enterprises based on the panel data of Latvian enterprises. While Bertrand et al. (2007) and Faccio (2007) found no obvious correlation between the two.

Studies on political connections focus on a similar theoretical perspective taking Chinese enterprises as samples. Xu and Zhou (2008) found that the disappearance of political connections would significantly reduce the market value of connected enterprises taking the Chen Liangyu case, who was once former party secretary of Shanghai municipal party committee. Li et al. (2008), found that party membership of private entrepreneurs helped improve the profit margin of enterprises' assets, based on the survey data of private enterprises in China in 2002. Wu et al. (2010) showed that for private enterprises, political connections helped improve enterprise value, while for state-owned enterprises, the effect is completely opposite, based on the analysis of listed companies in China. However, the study of Du et al. (2009) did not find that political connections significantly improved the performance of private listed companies. The research of Deng and Zeng (2009) found that the higher the degree of political association, the worse the business performance of enterprises.

The negative effect of political connections may come from the policy burden of enterprises. Wu et al. (2010) found in their study that state-owned enterprises with political connections tend to have more serious labor overemployment. However, Cheung et al. (2010) found that local governments would benefit from state-owned enterprises through connected transactions.

Current studies need to be lucubrated, due to the fact that most of the current research results focus on the short-term impact of political connections on enterprises rather than the specific mechanism. Therefore, further research needs to be carried out from a deeper perspective.

2.2 Growth Potential and Financial Constraints

A major representative of the long-term growth potential of an enterprise is its innovation ability.

Schumpeter (1934) mentioned the great role of innovation in economic growth in

his book The Theory of Economic Development. Porter (1990) also stressed the importance of innovation. With the continuous decline of China's economic growth rate, there are many concerns about the sustainability of China's economic growth sources among policy makers and academic scholars (Wu, 2006). The future of China's economy depends largely on whether fruitful technological innovation and industrial upgrading can be achieved. As an important force supporting the sustained, rapid and steady growth of China's economy, private enterprises are the main force of China's technological innovation. And the biggest factor that restricts enterprise innovation is financial constraint.

Brown et al. (2012) pointed out that the uncertainty of R&D activities is very high, and the information asymmetry in the financing process is also very serious. R&D activities are more affected by financial constraints than other investment activities. However, the transnational empirical research on financial constraints has not reached a consensus. On the one hand, the research of Hall (1992), Himmelberg, Petersen (1994) and Brown et al. (2009) found that the lower the financial constraint, the higher the R&D investment of enterprises. On the other hand, the research of Haroff (1999), Mulkay et al. (2001) and Bond et al. (2003) showed that there is no significant correlation between financing constraint and R&D investment.

The diversified research results may be related to whether the enterprise financing comes from exogenous financing or endogenous financing. Since Schumpeter's (1942) released the innovation theory, scholars have formed a consensus that endogenous financing is the main source of enterprise R&D investment. Hao and Jaffe (1993), Haroff (1997), Czarnitzki and Binz (2008), Himmelberg and Petersen (1994) and Brown et al. (2011) all pointed out that main source of enterprises R&D investment is from endogenous financing— enterprise profits or paid-up capital increase, which is more obvious in enterprises with short established time, high technology and small scale.

As for exogenous financing, Stiglitz and Weiss (1981) and Hall (2002) both pointed out that exogenous financing is difficult to become the main source of enterprise R&D investment, due to information asymmetry, moral hazard and adverse selection problems. However, the empirical study of Chiao (2002) and David et al. (2008) found that there was an obvious positive relationship between exogenous debt financing and enterprise R&D investment. In addition, fiscal subsidies, tax incentives and venture capital are also important exogenous financing channels to support enterprises' R&D investment (Hall and Lerner, 2010).

Claessens and Tzioumis (2006) pointed out that 75% of Chinese private enterprises regard financial constraints as the main obstacle to enterprise development in the investment environment report of the World Bank. However, political connections can significantly alleviate the financial constraints of enterprises (Khwaja and Mian, 2005; Faccio et al., 2006). Thus, it can alleviate the financing pressure of enterprises and potentially help promote R&D activities, which certainly help to the promotion in innovation ability.

How to identify and measure the financial constraints faced by enterprises is the most important part of the related research. Currently, there are four popular and

common methods to measure financing constraints: One is to calculate the investment-cash flow sensitivity coefficient (Fazzari et al., 1988); the second is to estimate the cash-cash flow sensitivity coefficient (Almeida et al., 2004). The third is to calculate the KZ index (Kaplan and Zingales, 1997). And the fourth is the estimated WW index (Whited and Wu, 2006).

The idea of the investment-cash flow sensitivity coefficient (Hovakimian,2009) is that if an enterprise does not have financial constraints, the investment will not depend on the cash flow status of the enterprise. At this point, enterprise investment will maintain a relatively stable level. Therefore, the deviation degree between the investment mean weighted by cash flow and the arithmetic mean of investment will be relatively small. The greater the deviation, the higher the dependence of investment level on cash flow is, and the stronger the financial constraints enterprises face.

The method of cash-cash flow sensitivity coefficient comes from scholars' analysis of enterprises' cash holding strategy. Relevant studies have shown that enterprises with tighter financial constraints are more difficult to obtain exogenous financing and tend to reserve a certain level of cash to ensure the implementation of subsequent investment projects. The greater the motive of precautionary saving, the higher the proportion of cash reserves withdrawn from operating cash flow. Therefore, enterprises with tighter financial constraints will show a greater cash-cash flow sensitivity coefficient, that is, the greater the cash-cash flow sensitivity coefficient, the tighter the amount of financing constraints enterprises face.

Both investment-cash flow sensitivity coefficient and cash-cash flow sensitivity coefficient are single-dimension measurement indexes. However, the financing constraints of enterprises will be affected by the scale, cash holdings, corporate debt and other factors, which is a multi-dimensional comprehensive situation. The use of these two single indicators to describe the financial constraints is often affected by many other factors. Therefore, they cannot accurately and effectively describe the overall financing constraints of enterprises.

To solve this problem, Kaplan and Zingales (1997) first proposed the comprehensive construction of financial constraint indicators by using variables including cash flow, cash holding ratio, long-term debt ratio, dividend ratio and Tobin's q, which reflect the financial status and growth of enterprises. This KZ index is one of the earliest comprehensive indicator to measure financial constraints. Whited and Wu (2006) found that KZ index could lead to some conclusions that were not consistent with intuition. For example, the largest enterprises with KZ index ranked the highest in bond credit rating, investment rate, sales growth rate and other aspects. Using the method of structural equation estimation, they obtained an alternative financing constraint index (i.e., WW index) and found that it was more in line with economic intuition. This paper mainly uses WW index and takes cash-cash flow sensitivity coefficient as supplement.

3. Data and Variables

3.1 Data Source

This paper chooses non-financial private listed companies listed on the Shanghai and Shenzhen Stock Exchanges from 1998 to 2015 as the original samples and built a micro database covering the financial status and asset status of enterprises. In this paper, the definition of private listed companies is based on whether the actual controller is natural or not. Private listed companies refer to listed companies that are ultimately controlled by individuals or families.

An important reason for choosing private listed companies as research samples is that listed companies have many standards and requirements on information disclosure, which is convenient to accurately obtain the political related information of corporate executives through public channels. The selection of sample time in this paper is due to the consideration of consistency of accounting standards and accuracy of data. Before 1998, the financial data disclosure of Chinese listed companies was relatively irregular. Meanwhile, after 2015, the number of listed companies in China increased significantly, and the short listing time could not accurately reflect the long-term impact.

Different from the earlier study on political correlation, the research sample of this paper does not include private enterprises that are listed by shell purchase. Political connections of such enterprises may have been established before privatization (Yu and Pan, 2008). In order to make the analysis of this paper free from the interference of the above complex factors, we limited the sample to listed companies that were private since IPO.

The data required for this paper involves corporate financial data and politically relevant information. Financial governance data is taken from the CSMAR database. Executive information is collected manually. With the help of the financial and economic sections of sina.com and ifeng.com, this paper manually searched and collected the information of the previous general managers and chairmen of listed companies (including tenure, year of birth, gender, education level and political information), and supplemented the above information as much as possible having the aid of Google. As a rule, this paper eliminated the companies that were specifically treated and indented the continuous variables at 1% and 99% to avoid outliers affecting the analysis.

3.2 Variables Design

The core variables involved in this paper are mainly political relevance, financing constraints and corporate characteristics.

Following previous practice in the literature, this paper uses the political identity of corporate executives as a proxy variable. In international literature, the general manager is usually regarded as the representative of senior executives of a company (Fan et al., 2007). However, under the company law of China, the chairman is the legal representative of an enterprise and also has important responsibilities for the operation of the enterprise (Firth et al., 2006; Liao et al., 2009). This paper takes

into account the experience of the chairman and general manager in government, army, people's congress and CPPCC, adopting method of Bai et al. (2006) and Li et al. (2006). As long as one of the chairman or general manager has the above political experience, the paper defines the enterprise as a political related enterprise and take coefficient POL as 1, otherwise it takes 0.

As mentioned above, in the description of financial constraint, the sensitivity coefficient of investment-cash flow and cash-cash flow sensitivity coefficient of single dimension measurement failed to accurately and effectively depict the comprehensive financial constraint condition of enterprises affected by multiple factors. The estimation of KZ index and WW index involves the measurement of Tobin's q. However, in reality, Tobin's q often has serious measurement errors (Erickson and Whited, 2000; Cummins et al., 2006). Under the insufficient development of China's capital market, it is difficult to obtain accurate estimation of the market value of enterprises, and the measurement error of Tobin's q is more serious. This will have a greater impact on the accuracy of financial constraint indicators.

Therefore, sensitivity coefficient and KZ index may not be applicable to China's actual institutional environment. In view of this, this paper draws on the structural estimation method of Whited and Wu (2006), selecting the data of Chinese listed companies, to accurately calculate the financial constraint index of private listed companies, and uses the cash-cash flow sensitivity coefficient as a supplement. Through comprehensive data analysis, this paper tries to accurately study the effect of political connections on financial constraint.

In addition to political connections and financial constraint index above, this paper uses the following control variable: enterprise scale (*Size*), age (*Age*), long-term debt ratio (*Lev*), return on equity (*ROE*), capital structure (*PPE*), ownership concentration (*H10*), whether the controller is the chairman or general manager (*Ucpd*), whether the chairman and the general manager are the same (*Presmn*) and executive human capital information. The scale of an enterprise is calculated by logarithmic total assets; the long-term liability ratio is long-term liabilities/total assets; the return on net assets is net profit/net assets; the asset structure is fixed assets/total assets, and the equity concentration ratio is the sum of squares of the shareholding ratio of the top ten shareholders. When the controller of a listed company is the chairman or general manager, *Ucpd* is 1, otherwise 0. When the chairman and general manager of a listed company are the same person, *Presmn* takes 1, otherwise it takes 0. Executive human capital information is composed of gender, age, federation of industry and commerce experience, party membership, work experience and education level. Among them, if the senior executive has the experience of federation of industry and commerce, the experience of federation of industry and commerce is 1. If the senior executive is a member of CCP, the party membership shall be 1. If the senior executive has experience in accounting, finance, law, banking or securities, etc., then it is 1, otherwise it is 0. The final working experience index of senior executive is the sum of the above five perspectives. According to the information disclosed in the executive's resume, the education

level of the executive is divided into junior middle school, high school technical secondary school, junior college, bachelor's degree, master's degree and doctor's degree, and assigned accordingly. For the purpose of data consistency and simplicity, the mean value of human capital information of general manager and chairman is used in the quantitative analysis.

In the calculation of financial constraint index, this paper drew on Zeng and Lin's method (2016) to carry out the structure identification result of WW index, and calculated the financial constraint index (FCI) by using the enterprise's long-term liability ratio, cash dividend distribution, logarithmic total assets, cash holding rate, industry average sales growth rate and industry average long-term growth rate. The larger the financial constraint index (FCI) is, the more profits an enterprise can gain from relaxing the financing constraint and the higher the degree of financial constraint. In order to calculate the cash - cash flow sensitivity coefficient (sen), the article also reference Almeida et al. (2004), selected enterprise scale (logarithmic total assets), investment opportunities ((total liabilities + equity value)/total assets), operating cash flow and stock of cash as control variables, increase political association and the effect of the year, regression analysis. In order to calculate the cash-cash flow sensitivity coefficient (Sen), this paper selected enterprise scale (logarithmic total assets), investment opportunities ((total liabilities + equity value)/total assets), operating cash flow and stock of cash as control variables, referring to Almeida et al. (2004). This paper also added political connections and year effect to do the regression analysis. Similar to FCI, the greater the cash-cash flow sensitivity coefficient, the greater the influence of cash flow on corporate cash holdings and the greater the degree of financing constraint.

And in the mechanism analysis, this paper first demonstrated political connections (*POL*) could help enterprises to expand. Then referring to Tong & Xiao (2019), the paper used the invention patent (*Innov*), to analyze the impact of political connections on innovation ability when financial constraints are alleviated, so as to analyze the long-term impact of political correlation on financing constraints.

Finally, total factor analysis is used to verify the damage of political connections to the long-term efficiency of enterprises. The logarithmic capital-labor ratio LnK/L and enterprise growth rate grow are the control variables, referring to the common TFP analysis method and comparing with the explanatory variables in the basic political connections analysis. Among them, logarithm capital labor ratio LnK/L equals to ln (fixed assets/total number of employees) and enterprise growth grow equals to (next period sales - current sales)/current sales.

Table 1: Statistical description of major variables

	All Samples				Mean in Groups		
Variables	Mean	Std	Min	Max	（1）Connected	（2）Non-connected	（1）-（2）Differences between Groups
POL	0.466	0.499	0	1			
size	21.06	0.988	16.51	25.38	21.16	20.98	0.1814***
lincome	20.46	1.301	9.044	25.27	20.52	20.36	0.1647***
fmage	11.70	4.442	0	30	11.18	12.14	-0.9641***
lev	0.470	0.945	0.00708	27.92	0.4236	0.5109	-0.0872**
ROE	0.0734	0.821	-23.96	26.06	0.1001	0.0502	0.0499
H10	0.161	0.108	0.000560	0.749	0.1639	0.1592	0.0047
RDs	0.929	39.97	-0.00714	2115	1.720	0.2399	1.480
Ucpd	0.748	0.434	0	1	0.8161	0.6920	0.1241***
Presmn	0.258	0.438	0	1	0.1910	0.3162	-0.1253***
gender	0.949	0.175	0	1	0.9425	0.9548	-0.0124*
age	46.26	6.163	29.5	66.5	46.89	45.54	1.353***
business	0.1124	0.2645	0	1	0.1974	0.0255	0.1718***
party	0.4191	0.4282	0	1	0.5150	0.3201	0.1950***
edu	3.198	0.838	0	5	3.173	3.219	-0.0463
exp	0.111	0.316	0	3	0.1207	0.1017	0.0191
manaparty	0.364	0.421	0	1	0.4513	0.2884	0.1628***
barr	0.730	7.823	0	179.1	0.3769	1.037	-0.6599**
FCI	-6.775	2.636	-32.52	1.726	-6.768	-6.781	0.0128
Sen	0.506	352.9	-30.44	21.91	-0.5539	1.440	-1.993
LnK/L	12.79	0.9914	10.63	15.75	12.84	12.75	0.08435**
grow	0.2621	0.6062	-0.7239	4.712	0.01651	0.02003	-0.02609
innov	8.882	126.0	0	3597	3.471	13.59	-10.12**
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively							

Table 3.2 lists the statistical description of the main variables and the mean values of the variables grouped according to whether they are politically related or not.

4. Alleviation on Financial Constraints by Political Connections

The most direct impact of political connections on enterprises is to influence the degree of financial constraints through tax incentives, financing facilities and even government subsidies. Financial constraint is one of the most critical factors that affect enterprise R&D innovation. Political connections can ease the financial constraints of enterprises and thus help them carry out R&D activities. In order to

test this mechanism, this paper used the method of WW index to describe the degree of financial constraint (FCI), and then carried out quantitative analysis.

This paper used the following empirical model to test the impact of political connections on enterprise innovation:

$$FCI_{it} = \alpha POL_{it} + \beta X_{it} + Year + u_{it} + \varepsilon_{it} \quad (1)$$

FCI in formula (1) represents the financial constraints faced by the enterprise and is measured by WW index. POL represents political connections. X is the control variable, including enterprise scale (Size or lincome), enterprise age (Age), long-term debt ratio (Lev), return on equity (ROE), whether the controller is the general manager or chairman (Ucpd), whether the general manager and chairman are the same person (Presmn), and human capital information of senior executives of the listed company. Year is a dummy variable used to control the year effect, while the individual effect represents the specificity error. The symbol and significance of α is focus of this paper.

WW index is the earliest financial constraint method with high accuracy proposed by Whited and Wu (2006). Based on the indefinite dynamic model of enterprise value maximization, the paper described the degree of financial constraint by introducing constraints into the maximization equation, identifying the structural formula of coefficients, and calculating the Lagrange multiplier of financial constraint. In operation, WW index only requires the estimation Lagrange coefficient of corporate shareholders' cash flow constraints equation. The larger the Lagrange coefficient value is, the more profits obtained by relaxing the constraint, which means that the enterprise's financial constraint degree is higher.

In the data analysis, this paper calculated the financial constraint index (FCI) by using the enterprise long-term debt ratio, cash dividend distribution situation, the logarithmic average total assets, industry sales growth rate, the cash rate and industry average long-term growth rate, referring to Zeng and Lin (2016) identification conclusion based on Shanghai and Shenzhen listed companies. The specific formula is:

It is worth noting that since the samples analyzed in this paper are all private listed companies, the dummy variables representing the property nature of the company are omitted in the calculation. This does not affect the accuracy of describing the relative size of financial constraints.

For the sake of accuracy of the research conclusion, besides using WW index for regression, this paper also used cash-cash flow sensitivity coefficient for analysis to supplement empirical evidence. Financial constraint identification strategy based on cash-cash flow sensitivity coefficient was first proposed by Almeida et al. (2004). Enterprises with high degree of financing constraints are more difficult to obtain exogenous financing and need to reserve more cash, thus presenting a higher cash-cash flow sensitivity coefficient. In the empirical analysis, this paper firstly carried out the regression of cash-cash flow sensitivity coefficient, and then used the control

variables such as operating cash flow, cross term of political connections and operating cash flow, investment opportunities, enterprise size and year to conduct regression on the change of enterprise cash stock, and finally obtained the regression results.

$$d.Cash = -0.4247 + 0.2127CF + 0.0391POL*CF - 0.0068POL + 0.0096Q + 0.0108size$$

Afterwards, the fitting value of d.Cash was divided by CF to calculate the cash-cash flow sensitivity coefficient (Sen). Similar to WW index, the larger Sen is, the greater financial constraints the enterprises face.

And in return in the financial constraints, this paper used control variables including the enterprise scale (Size) or logarithmic gross income (lincome), age of enterprises (Age), long-term asset-liability ratio (Lev), return on equity (ROE), whether the controller is the general manager or chairman (Ucpd), whether the general manager and chairman are the same person (Presmn), and human capital information of senior executives of the listed company, modelled on the theory of Dang and Zhen (2008) and Zheng (2001)[5]. This paper used panel FE method and the corresponding estimated results are reported as follows.

[5] Due to the space, the corresponding regression and the data used were not reported in the paper. Among them, the operating Cash flow (*CF*) = net business activities generated cash flow/total assets; investment opportunities (*Q*) = (total liabilities + equity value)/total assets; equity value = current equity × share price + non-current equity × net asset per share; cash (*Cash*) = ending balance of cash and cash equivalents/total assets.

Table 2: FE Estimation results of political connections and financial constraints

	FCI		**Sen**	
	(1)	(2)	(1)	(2)
POL	-0.372**	-0.367**	-1.510*	-1.463*
	(0.203)	(0.212)	(1.332)	(1.341)
size	-0.266*		0.239	
	(0.156)		(0.760)	
lincome		-0.466***		-0.548
		(0.131)		(0.635)
lev	-0.252	-0.378	-0.292	-0.773
	(0.502)	(0.498)	(2.487)	(2.484)
ROE	-2.836***	-2.551***	5.351**	5.802**
	(0.551)	(0.557)	(2.707)	(2.737)
fmage	0.0697*	0.100***	0.258	0.372**
	(0.0359)	(0.0341)	(0.174)	(0.166)
Ucpd	-0.0783	-0.0758	-0.0510	0.0462
	(0.264)	(0.263)	(1.282)	(1.277)
business	-0.0406	0.0818	2.758	2.976
	(0.712)	(0.712)	(3.450)	(3.455)
party	0.149	0.248	0.861	1.007
	(0.391)	(0.392)	(1.920)	(1.925)
Presmn			-0.375	-0.369
			(1.153)	(1.153)
_cons	-1.972	1.591	-8.443	6.467
	(3.065)	(2.499)	(14.94)	(12.13)
R^2	0.018	0.023	0.006	0.006
N	2477	2477	2446	2446
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

Table 2 shows the FE estimation results of financial constraint degree (FCI) on political connections (POL). The first and second columns of the table used FCI as the explained variable for regression, while the third and fourth columns used Sen (cash-cash flow sensitivity coefficient) as the explained variable for regression. In each regression, the variables of various enterprise characteristics were simultaneously controlled. The first and third columns used Size (logarithmic total assets) to represent enterprise size, while the second and fourth columns used *lincome* (logarithmic total revenue) to control enterprise size. The results show that political connections can help companies reduce financial constraints.

Table 3: FE Estimation of corporate sales on financial constraints (*FCI/sen*) and political connections

	Enterprise Scale			
	Size	Size	lincome	lincome
POL	0.1031**	0.1195***	0.1128**	0.1350**
	(0.0435)	(0.0436)	(0.0539)	(0.130)
FCI	-0.01985***		-0.0311***	
	(0.0051)		(0.0063)	
sen		-0.00001		-0.00002
		(0.00003)		(0.00004)
N	1809	1770	1809	1770
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

Regression results of enterprise size on financial constraints (*FCI/sen*) and political connections (*POL*) are reported in Table 3. FE estimation method is adopted. According to the results, no matter what kind of indicator is used, political connections will promote the expansion of enterprise scale, which is realized to some extent through financial constraints.

Table 4: FE Estimation results of invention patents on financial constraints (*FCI/sen*) and political connections

	Innov（Invention Patent）			
	(1)	(2)	(3)	(4)
POL	-0.300**	-0.299**	-0.312**	-0.311**
	(0.129)	(0.129)	(0.130)	(0.130)
FCI	-0.00216	-0.00195		
	(0.0151)	(0.0151)		
sen			-0.00271	-0.00265
			(0.00278)	(0.00274)
N	1512	1512	1480	1480
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

Regression results of invention patents on financial constraints (*FCI/sen*) and political connections are reported in Table 4. Enterprise innovation ability uses report period invention patent (*Innov*) to characterize. The FE estimation method of panel negative binomial regression is adopted. In each regression, variables of enterprise characteristics are controlled by referring to Tong & Xiao (2019). The results show that, after removing the influence of financial constraints, political connections still has a negative impact on enterprise operating efficiency.

The results from Table 2 to Table 4 show that political connections can alleviate financial constraints faced by enterprises, help enterprises expand their scale, and to some extent help enterprises improve their innovation ability and optimize their

operating efficiency, but its overall impact on innovation ability is still negative.

5. Robustness test of Financial Constraint Effect

In Section IV, this paper gets the conclusion that political connections can help enterprises relieve the degree of financial constraints they face, but it still damages their innovation ability and production efficiency. In this section, the paper verifies this conclusion by using the region-industry mean of corporate political connections as the instrumental variable of *POL*, following the practice of Fisman and Svensson (2007). The corresponding regression results show that the conclusion in previous section is robust.

Table 5: Robustness test results of enterprise innovation, political connections and financial constraints

	Innov（Invention Patent）			
	Panel IV	Instrumental Variables	Panel IV	Instrumental Variables
POL	-0.301**	-0.0464	-0.316**	-0.0491
	(0.127)	(0.0589)	(0.128)	(0.0592)
FCI	-0.00207	0.00486		
	(0.0152)	(0.00587)		
sen			-0.00267	-0.00205*
			(0.00269)	(0.00122)
N	1512	2154	1480	2123
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

6. Political Connections and Long-term Growth

It is confirmed above that although political connections help related enterprises to ease financial constraints and expand scale rapidly, it still damages their innovation ability and operating efficiency.

However, using the number of simple and practical invention patents to describe the operating efficiency of enterprises faces the problem of ignoring patent differences, although it has advantages in unified standards, high quality of data and comprehensive input and output in the early stage. Since this paper focuses on enterprise productivity and long-term growth capacity, indicators closer to long-term productivity for analysis should be adopted.

This can be investigated to a certain extent by using capital productivity and labor productivity as proxy variables. However, this kind of analysis is easy to be disturbed by the changes of input of production factors brought by the mitigation effect of politically related financial constraints. After enterprises acquire political connections, sufficient capital supply is likely to lead to a decline in capital productivity and a rise in labor productivity. This contradiction undoubtedly increases the difficulty of analysis.

One possible approach is to use total factor productivity (TFP) for analysis. It is generally believed that TFP comes from the aspects of technological progress, organizational innovation, specialization and production innovation, and is the part where the output growth rate exceeds the factor input growth rate, which can accurately depict the production efficiency and long-term growth potential of enterprises to a certain extent. According to the widely known Cobb-Douglas production function, total factor productivity can be calculated as follows:

$$LnTFP_{it} = LnVA_{it} - \hat{\beta}_k LnK_{it} - \hat{\beta}_l LnL_{it}$$

LnVA, LnK and LnL respectively represent the logarithm of enterprise value added, logarithm of capital input and logarithm of labor input. $\hat{\beta}_k$ is the output elasticity of capital and $\hat{\beta}_l$ is the output elasticity of labor. How to obtain the consistent estimation of $\hat{\beta}_k$ and $\hat{\beta}_l$ is the most important part to accurately calculate and solve the total factor productivity. A common practice in the current work is to use classical OLS regression or FE regression on the basis of controlling enterprise characteristic variables such as industry and region. However, these two methods are always disturbed by endogenous problems -- enterprises with higher productivity tend to add variable factors such as labor, which leads to the overestimation of labor's output elasticity by ordinary OLS method and the underestimation of capital input's output elasticity, resulting in estimation errors (Olley and Pakes, 1996). An important assumption of fixed effect regression is that the productivity of enterprises does not change with time, but in reality, the productivity of enterprises is likely to change with time.

In order to avoid the influence of simultaneity bias and selectivity bias on the calculation of total factor productivity, the OP method proposed by Olley and Pakes (1996) is used for estimation in this paper. The basic idea is that the enterprise will make investment decisions according to the current productivity situation, so the investment level of the enterprise can be used as the proxy variable of the unobservable productivity. Meanwhile, the OP method also introduces exit variables to correct the sample selection deviation in panel data. Although the OP method could not get the logarithm value of the investment of the enterprise due to reasons such as zero or negative value or missing index, and there was a certain degree of sample loss, it was still widely applied and supported in the empirical research (Javorcik, 2004). In this paper, referring to the practices of most studies, the parameter structure of production function is considered to have extrapolation effectiveness when calculating productivity. As long as there is no lack of data of the three variables of added value, capital and labor, the calculation of total factor productivity will be carried out according to the above formula.

For reasons of space, this paper omits the intermediate process of the OP method and gets:

$$LnTFP_{it} = LnVA_{it} - 0.3355 LnK_{it} - 0.4104 LnL_{it}$$

Total factor productivity (TFP) was calculated and used as the explained variable for regression analysis of political correlation (POL). According to common practices, size of enterprises, long-term debt ratio (Lev), logarithmic capital-labor ratio (lnK/L), growth (grow), ownership concentration (H10), age of enterprises and human capital information of listed companies were added as control variables. Table 6.1 reports the FE and GMM estimated results of total factor productivity (lnTFP) on political connections.

Table 6: FE and GMM Estimated results of total factor productivity (*lnTFP*) on political connections

	lnTFP（logarithm of total factor productivity ）			
	FE(1)	FE(2)	GMM(1)	GMM(2)
POL	-0.314**	-0.312**	-0.235*	-0.230*
	(0.127)	(0.127)	(0.142)	(0.142)
size	0.126	0.126	0.174	0.179
	(0.0893)	(0.0893)	(0.122)	(0.122)
lev	-0.579*	-0.587*	-1.098**	-1.095**
	(0.305)	(0.304)	(0.431)	(0.431)
lnK/L	-0.0499	-0.0489	0.0979	0.0991
	(0.0624)	(0.0623)	(0.0896)	(0.0897)
grow	-0.161**	-0.161**	-0.329***	-0.329***
	(0.0643)	(0.0642)	(0.0783)	(0.0783)
H10	0.497	0.494	-0.0908	-0.143
	(0.727)	(0.727)	(0.974)	(0.976)
fmage	0.0682**	0.0679**	0.0510**	0.0495*
	(0.0266)	(0.0266)	(0.0252)	(0.0253)
Ucpd	0.202	0.207	0.113	0.121
	(0.130)	(0.129)	(0.156)	(0.157)
Presmn	-0.0380			0.124
	(0.111)			(0.149)
business	-0.681**	-0.696**		
	(0.289)	(0.285)		
party	0.0595	0.0552	0.149	0.145
	(0.182)	(0.182)	(0.244)	(0.244)
L.lnTFP			0.0200	0.0194
			(0.0533)	(0.0532)
_cons	6.931***	6.909***	4.230*	4.125*
	(1.899)	(1.896)	(2.387)	(2.391)
R^2	0.148	0.148		
N	921	921	657	657
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

The FE results in Table 6 indicate that the existence of political connections will harm the long-term growth potential of enterprises. However, this may be disturbed by endogenous problems, that is, enterprises have a higher total factor productivity in the early stage tend to have a higher level of total factor productivity later. But, the negative effect in the results indicates that the decrease of total factor productivity caused by political connections will further lead to the decrease of total factor productivity. The existence of endogenous problems does not affect the correctness of the conclusion. This conclusion is also verified from the GMM results in Table 6.

For the purpose of research accuracy, this paper controls the former value of enterprise total factor productivity and use total factor productivity to conduct GMM regression of numerical difference. Relevant results show that the conclusion that political connections damages the long-term growth potential of enterprises is sound.

Table 7: GMM estimated results of log difference in political connections and total factor productivity

	d*lnTFP*（Log difference in Total Factor Productivity）			
	(1)	(2)	(3)	(4)
POL	-0.288**	-0.310**	-0.291**	-0.309**
	(0.138)	(0.137)	(0.136)	(0.136)
lnTFP	-1.043***	-1.043***	-1.042***	-1.043***
	(0.0490)	(0.0491)	(0.0488)	(0.0488)
N	827	827	829	829
*, ** and *** indicate significance at 10,5, and 1 percent levels, respectively				

7. Conclusions and Policy Suggestions

The production efficiency of private enterprises is of great significance to the long-term development of China's economy, as the main force to promote technological innovation and support economic growth. But the good companies tend to gain political connections and then go on a path of declining productivity.

The root of this problem lies in the existing resource allocation system, which is still largely controlled by the government. Therefore, it is necessary to reform the existing factor distribution mechanism as soon as possible and treat all enterprises equally, in order to fundamentally solve the problem that political connections damage the long-term growth potential of enterprises.

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