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Do the government subsidies inhibit the entity over-financialization? Fresh evidence from China

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ABSTRACT

In order to verify effect of the industrial policies on solving the problem of market failure, we collect the data from China A-share listed companies among 2008-2019, and analyze the effect of government subsidies on the entity over-financialization. The results show that government subsidies significantly inhibit the entity over-financialization. Because the government subsidies could increase the performance of enterprise's main business and level of the enterprise's profitability. Subsequently, the enterprise's arbitrage from cross-industries and the managers' composition could be decreased. Consequently, government subsidies could reduce the entity over-financialization by the reduce of enterprise's arbitrage from multi-industries and increase of the managers' composition which is related to the enterprise's performance. The results also indicate that the entity financialization is mainly motivated by enterprise arbitrage rather than 'preventive reserve' in China. Moreover, the inhibitory effect of government subsidies on the entity over-financialization is only significant in the enterprises with non-state-owned, high-tech, and higher level of demand of innovation. Thus, the government should accurately implement subsidy policies for the enterprises and increase the supports for enterprises with high-tech and higher level of demand of innovation, which could promote economy high-quality development.

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1. Introduction

After the financial crisis in 2008, developed countries, such as the United States, Japan and European counties, all were observed that the entity economies are shrinking. They all put forward industrial policies for the manufacturing industry in order

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to encourage the physical investments, as well as some developing counties, such as Vietnam, China and so on. However, the global manufacturing supply chain has faced a critical period for transformation and upgrading of the physical industries, the technological innovation play an important role currently. China, which is the biggest developing country, show the most urgent demands of transformation and upgrading of the industries and technological innovation. However, due to high costs, insufficient confidences from the entrepreneurs, bottlenecks of technology, shortage of human resource and capital, the entity economy is decreasing sharply in China. China's economic is transforming from entity economy to virtual economy in recent years. According to China's National Bureau of Statistics, the growth rate of finance and real estate industries, i.e., growth of finance and real estate industries are divided by the GDP rose from 10.32% to 15.61%, while the growth rate of manufacturing industry, i.e., the growth of manufacturing industry is divided by GDP decreased from 32.12% to 26.18% from 2008 to 2020[1].Thus, the entity financialization is getting more and more serious in China, and the development of physical industries is important for China's economics.

The entity financialization result in the phenomenon that the economy transforms from 'real economy' to 'virtual economy'. The moderate entity financialization could save capital flow, reduce uncertainty of the operation, and benefit for enterprise's development. But the entity over-financialization will exacerbate the risk of the operation, decrease the enterprise's long-term interests by squeezing out the enterprise's innovation investment. According to the 'core competence theory' (Hamel & Prahalad, 1989), entity companies should invest resources in their main business in order to gain core competitive advantages. Entity over-financialization switches capital investment in the physical assets to the financial assets. The supply capacity of product will be decreased, the uncertainty of economic activities and risk of financial crisis will both be increased (Guanchun, 2017).

Government subsidy is one of important fiscal policies, which is usually used for supporting the enterprise's development and improving the allocation of resources. Government use 'visible hands', e.g., the government subsidies, to intervene allocation of enterprise's resources, encourage the enterprise to increase the physical investment and technological innovation in order to improve the enterprises' long-term development. According to data statistics from Guotaian, the amount of government subsidies provided by the Chinese government to listed companies has increased from ¥ 92.06 billion to ¥ 195.279 billion from 2008 to 2019. According to this fact, two questions should be exploited.

RQ1: *Could the government subsidies effectively inhibit entity over-financialization?*

RQ2: *How the government subsidies affect the over-financialization?*

Previous studies mainly focus on the motivation of entity financialization (Admati, 2017; Crotty, 2015; Duchin et al., 2017; Nerenberg et al., 2018; Orhangazi, 2008; Sen & Dasgupta, 2018; Stulz, 1996) and consequences of financialization (Bleck & Liu, 2018; Demir, 2009; Duchin et al., 2017; Gehringer, 2013; Orhangazi, 2008; Shin, 2012; Sokol, 2017; Tori & Onaran, 2018). The existing research usually does not distinguish the degrees of financialization, they could help to clarify the conception and effect

mechanism of entity financialization. In our studies, we discuss the effects of government subsidies on entity over-financialization. There are three innovations. Firstly, the financialization are taken as heterogeneous, we separate over-financialization from financialization, and mainly focuses on studies on over-financialization. Secondly, by different with the studies of the motives and effect of entity financialization by previous studies, we discuss the governance path and mechanism of entity over-financialization from the perspective of government subsidies. Thirdly, considering the property rights of enterprises and the dependence of innovation demand, we present the differences in multi-dimensional governance effect of the government subsidies on the entity over-financialization.

2. Literature review and hypothesis

2.1. Literature review

2.1.1. Motivations and effect of entity financialization

Most of the existing studies take the entity financialization as homogeneous, and mainly focus on motivations and effects of entity financialization on economy. There are three different kinds of the motivations of financialization. The first one is named as motivation of 'investment substitution'. Because the real economy is sluggish and the rate of return on productive investment is small, companies prefer to invest in financial assets for greater rate of return of capital investment instead of physical assets investment with a lower return rate (Crotty, 2015; Orhangazi, 2008). The second one is the motivation of 'precautionary savings'. Financial assets have high liquidity. Companies could obtain liquidity reserves by investing in financial assets. It could prevent the risk of capital flow rupture caused by cash flow shocks (Duchin et al., 2017; Stulz, 1996). The third one is motivation of 'the change of corporate governance'. Currently, the goal of corporate governance has shifted from maximizing corporate value to maximizing shareholder's value. In order to meet shareholder's profit expectations, managers invest in financial assets to improve enterprise's performance and increase the prices of the stock (Admati, 2017; Sen & Dasgupta, 2018).

About the studies on the effects of financialization on economy, most studies believe that financialization has a negative impact. For example, the financial assets will inhibit the development of enterprise's main business (Xu & Xuan, 2021), reduce capital accumulation (Stockhammer, 2004), reduce R&D investment and fixed asset investment (Tori & Onaran, 2017), inhibit enterprise innovation (Gleadle et al., 2014; Lee et al., 2020), give rise to the real estate bubble (Bleck & Liu, 2018), and reduce the value of enterprises (Huang et al., 2021). There are limited studies deem that financialization play a positive role on economy. Financialization diversifies risks of the enterprise's business (Demir, 2009), reduces corporate financing constraints (Gehringer, 2013), and corrects resource misallocation caused by financing discrimination (Duchin et al., 2017; Hsieh & Klenow, 2009).

According to the heterogeneity of financialization, most previous researchers study over-financialization from the macro-perspective. Some empirical research results show that the relationship between economic growth and financial development is not positively correlated. It is not always appropriate that the enterprise's financial

assets are increasing (Cecchetti & Kharroubi, 2012; Shen & Lee, 2006). The scale effect of development of finance could promote economic growth, but it also increases the risk of economic growth (Beck, 2014). There should be a threshold of development of finance, it will have a negative effect on economic growth if the development of the finance exceeds this threshold (Arcand et al., 2015). Ductor and Grechyna (2011) defined the over-financialization by standing on the perspective of growth rate. They believe that when the value, i.e., the growth rate of the financial investment minus the growth rate of the productive investment, exceeds 4.45%, over-financialization will occur. Cecchetti and Kharroubi (2012) defined over-financialization from the perspective of employment rate. They believed that when the percentage, i.e. 3.5%, is exceeded by the proportion, i.e., employment of financial department is divided by the total employment, over-financialization will occur. Law and Singh (2014) find that there is a moderate threshold value of financial development, as while as Arcand et al. (2015).

The financialization will inhibit economic growth if the threshold value is exceeded. Limited researchers study the entity over-financialization from the micro-perspective, and put forward the conception of entity over-financialization (Su & Liu, 2021). When the level of financialization exceeds the optimal value, financial investment will excessively occupy the capitals for corporate productive investment, which will reduce shareholders' value, the development of enterprises will be hindered, over-financialization will occur (Su & Liu, 2021). Furthermore, Su and Liu (2021) also study the impact of entity over-financialization on enterprise innovation, and believe that over-financialization could increase the dependences of company development on financial investment. Thus, the enterprise innovation will be hindered.

2.1.2. Effect of government subsidy

The effect of government subsidies on enterprise investment has been in the spotlight for a long time, but the consistent conclusion has not been obtained. Stulz (1981) firstly study the relationship between government subsidies and enterprise's investment. He finds that the government uses political power to intervene the allocation of resources in the capital market in order to maximize its own interests, which will harm the efficiency of the market and investor's profit. Shleifer (1994) also believes that government subsidies will lead to low efficiency of the enterprise's investment. Bernini and Pellegrini (2011) find that although government subsidies increase enterprise investment in a short term, they fail to increase the enterprise's total-factor productivity. However, some researchers hold the opposite attitude towards the effect of government subsidies. Bar-Yosef and Landskroner (1981) think that government subsidies increase enterprise's cash inflows, alleviate the enterprise's cash flow constraint. Meanwhile, the enterprise's performance and efficiency are improved, and the value of the enterprise will be increased, as well as Luo et al. (2021) and Colombo (2013). Harris and Trainor (2005) believe that government subsidies could increase enterprise's productivity, as while as Nicolini and Tavoni (2017).

The relationship between government subsidies and R&D investment does not have the consensus conclusion by the researchers until now. Some scholars believe that direct government subsidies or tax cut have a positive and significant effect on

enterprise investment in innovation. Government subsidies encourage enterprise to invest in R&D (Guellec & Van Pottelsberghe De La Potterie, 2003), alleviate the capital constraint of enterprise innovation (Tzelepis & Skuras, 2006), increase the positive impact of external capital on enterprise innovation (Lerner & Tetlock, 1999), and enhance the company's innovation abilities (Görg & Strobl, 2007). But some other researchers think that government subsidies and R&D investment are not positively correlated. Government subsidies may distort the enterprise's R&D investment. Companies will change their R&D projects in order to obtain high subsidies. Government subsidies squeeze out R&D investment by companies' own capitals (Yu et al., 2016) . In addition, some scholars believe that only when government subsidies reach an appropriate scale, ability of enterprise innovation could be improved (Jianjun & Xiao-yun, 2021).

In summary, the academic researchers have studied a lot on the relationship between entity financialization and government subsidies. However, there are still some issues which have not been involved in the previous literatures. Firstly, most of the previous studies take entity financialization as homogeneity, and over-financialization is not separated from studies of financialization. But they provide clues for clarifying the internal mechanism that government subsidies inhibit the entity over-financialization. Secondly, previous studies mainly focused on the micro-mechanism of entity financialization. Entity over-financialization could lead to the crisis of the hollowing out of the industry, but the issue, i.e., how to effectively inhibit the entity over-financialization, has not been studied until now. Thirdly, existing research mainly discusses the impact of government subsidies on productive investment and R&D investment, but the mechanism and consequence of effects of government subsidies on the entity over-financialization have not yet analyzed. Therefore, our studies try to exploit these issues.

2.2. Hypothesis

In recent years, the increase of economy continues getting down, and the entity economy is decreasing sharply, but the financial and real estate investment is rising conversely in China (Guanchun et al., 2018). With maximizing enterprise's profit, the physical enterprises are gradually deviating from their main business, i.e., they reduce the productive investment, and invest more in financial assets. Then, the enterprise's profits rely on financial investment. However, according to virtual capital theory, virtual capital could not create value, it is priced based on expected future earnings. Thus, its price is highly fluctuant, and the earnings of entity over-financialization from financial investment are also with highly fluctuant. The enterprise's profits with the over-financialization will mainly depend on financial investment. The enterprise will earn short-term excess profits from investment in financial asset, but the prosperity of the capital market is usually in short term, such high returns are not sustainable, and over-financialization could hinder the sustainable development of enterprises (Seo et al., 2012). The entity over-financialization leads to aggravate the consequence, i.e., 'hollowing out of the economy', and it may cause systemic risks of finance. In order to solve the market failure problem, the government could provide subsidies for enterprise's innovative investment and productive investment. The

government subsidies could correct the resources allocation, restrain the enterprise's financial investment. There are three main paths which could explain the effect of the government subsidies on entity over-financialization, which are as following.

Government subsidy could inhibit the entity over-financialization by reducing the enterprise's financing constraint. Enterprise's financial asset investment exceeds its level of enterprise's applicable development and utilization for an enterprise with over-financialization. Thus, the excessive financial investment is abuse and waste of resources, the optimal resource allocation of enterprises is distorted (Xianhuan et al., 2019). Entity over-financialization will lead to conflicts between corporate financial asset investment and maximization of shareholder value (Shaohua et al., 2020). Enterprises with over-financialization have complex capital structure, which is relatively stable, and the liquidity of financial assets is weak (Shaohua et al., 2020), the degree of information asymmetry is higher (Peng et al., 2018). The financing constraints have negative and significant effect on enterprise's development. According to the signal theory, government subsidy is a high-quality signal and invisible guarantee for the enterprise. The government subsidies could help the enterprise to reduce the asymmetry of the information between the enterprise and the investors in external capital market, and increase both of the debt and equity investment funds to flow into the enterprises which accept the government subsidies (Guo, 2018). Investors take the government subsidies as a positive signal which is advantage for companies (Kleer, 2010), it will promote the enterprise easily to finance from the banks and investors, and alleviate corporate financing difficulties. According to the enterprise's motivation of 'precautionary reserve', the capital shortage could adversely affect the enterprise's operations, the enterprise's allocation of financial assets could prevent the capital shortage caused by cash flow shocks (Demir, 2009; Stulz, 1996). Based on the perspective of resource, government subsidies are free and direct for enterprise's financing. Government subsidies are the direct and free resource supplement for enterprises. Government subsidies could provide cash flow for enterprise's operation, alleviate their financing constraints (Guo et al., 2016), and reduce their motivation of 'precautionary reserve'. Government subsidies alleviate enterprise's financing constraints by directly providing funds and indirectly attracting equity financing and debt financing. Thus, enterprises have less incentive to reserve financial assets which is used to deal with uncertainty of precautionary. Consequently, the entity over-financialization will be inhibited.

Government subsidy could inhibit the entity over-financialization by reducing the motivation of enterprise's arbitrage from cross-industries. In recent years, the macroeconomic environment is getting worse, the productive marginal profit is continuously decreasing because of the fierce market competition. However, the financial and real estate industries attain excess profits. Based on the driving force of 'investment substitution', productive enterprises have begun to invest in the financial and real estate industries in order to arbitrage from across industries in China (Wang et al., 2016). The enterprise's arbitrage from cross-industries drives the enterprise's development deviate from their main business, their profits gradually and mainly rely on profit of financial investment. The government subsidies could reduce the cost of productive investment, improve the efficiency of production and operation, and increase the return of enterprise's investment by gratuitous appropriations, subsidy of

bank interest and non-monetary assets. With the improvement of the marketization, competitions between the financial companies are getting fierce, and the return rate of financial investment is gradually falling. Thus, the government subsidy decreases the gap between the return rates of real investment and financial investment. The motivation of enterprise's arbitrage from cross-industries has been weakened. Consequently, the entity over-financialization will be inhibited.

Government subsidy could inhibit the entity over-financialization by increasing the manager's compensation which is related to enterprise's performance. The entity financialization is caused by balancing the enterprise investments between short-term profitability and long-term profitability, and there are serious agency problems (Han & Tang, 2019). In last ten years, the financial assets improve enterprise's short-term profitability, but enterprise's resources are limited, and the entity financialization has a crowding-out effect on enterprise innovation and investment in productive assets, which are not conducive to the enterprise's long-term development (Chengsi & Butan, 2016). The choice, i.e., the enterprise's long-term profit or short-term profit, is closely related to the manager's compensation contract. In order to maintain the enterprise's performance which decides manger's salary, managers would like to invest in the financial assets rather than the productive assets. According to the accounting policy of government subsidies, when companies accept the government subsidies, they take them as non-operating income. It increases the company's total assets and net assets, improves the company's performance and profit. Thus, the managers' compensation will be increased (Danlu & Xiaoyan, 2014). Government subsidies could increase the enterprise's performance, which will result in increasing the manager's compensation. Tendency, i.e., financial investments replace productive investments, is decreased. Consequently, entity over-financialization could be inhibited.

In short, when the enterprises with over-financialization would accept government subsidies, the enterprise's financing constraints could be alleviated. Meanwhile, the gap between the two return rates of entity investment and financial investment could be decreased, the enterprise will balance investment structure, they will increase physical performance, i.e., the motivation of enterprise innovation and productive investments could be stimulated. As a result, the enterprise will reduce the enterprise's motivation of 'precautionary reserve'. The motivation of enterprise's arbitrage from cross-industries will be reduced, and the managers' compensation which is related to enterprise's performance will be increased. Subsequently, the enterprise will increase innovation input or productive investment, the enterprise's investment in financial assets will be weakened. Consequently, the level of enterprise's financialization could be improved. Based on the analysis above, the following hypothesis is proposed:

Hypothesis: *government subsidies have significant inhibitory effects on entity over-financialization.*

3. Methodology

3.1. Data

In our studies, we selected the data from China A-share listed companies. Since the China's accounting standard of government subsidy has changed in 2006, as well as

many deficiencies of the data of 2007, in order to make sure validity of comparability of data, we selected the data from China A-share listed company from 2008 to 2019, i.e., 33522 original samples[2], as while as some necessary process. Firstly, we exclude the samples of companies which are marked with ST and ST*[3], i.e., 1270 samples. Secondly, we exclude samples, asset-liability ratio of which is greater than 1, i.e., 359. Thirdly, we exclude the samples of financial and real estate companies, i.e., 2207. Fourthly, we exclude samples of financial data which are missed during the observation period, i.e., 8153. Fifthly, we exclude samples of entity non-over-financialization, i.e.,13,075. All of data were derived from the Guotaian (CSMAR) database. Finally, 8458 samples from 2,612 listed companies were collected.

3.2. Variables

3.2.1. Interpreted variable

Interpreted variable is entity over-financialization (*overfin*). Learned from Duchin et al. (2017), entity financialization = (trading financial assets + derivative financial assets + distribution loans and pads + finance assets of available for sale + holding expiration investment + the amount of financial asset items in other liquid assets and long-term equity investments + net assets). According to studies, i.e., Xianhuan et al. (2019) and Richardson (2006), the model is constructed to express the degree of entity financialization.

$$Fin_{i,t} = c_0 + \alpha_1 Fin_{i,t-1} + \alpha_2 Growth_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 Cf_{i,t-1} + \alpha_5 Size_{i,t-1} + \alpha_6 Age_{i,t-1} + \alpha_7 ROA_{i,t-1} + \sum Industry + \sum Year + \varepsilon_{i,t} \quad (1)$$

$Fin_{i,t}$ is the degree of financialization in current period, $Fin_{i,t-1}$ is the degree of financialization of last period. $Growth_{i,t-1}$ is the growth rate of enterprises, which is expressed by total assets in the last period; $Lev_{i,t-1}$ is the enterprise's financial lever, which is expressed by the last asset-liability rate; $Cf_{i,t-1}$ is the cash flow, which is expressed by the value of last net cash flow dividing total assets. $Size_{i,t-1}$ is the size of enterprise, which is expressed by the natural logarithm of the total assets in the last period. $Age_{i,t-1}$ is the enterprise experience, which is expressed by years that the enterprise has listed in; $ROA_{i,t-1}$ is the profitability, which is expressed by the net interest rate of total assets in last period. *Industry and Year* are both virtual variables. We analyze the Model (1) with linear regression. The samples, residuals of which are greater than 0, are expressed entity over-financialization (*Overfin* expresses residual). Otherwise, the samples, residuals of which are smaller than 0, are expressed entity non-over-financialization.

3.2.2. Interpretation variable

Interpretation variable is government subsidies (*Sub*). Government subsidies are expressed by the ratio that the amount of government subsidies, which the enterprises accepted, is divided by the main business income.

3.2.3. Control variables

There are eleven Control Variables. Because entity financialization will also be affected by other factors, such as enterprise's financial characteristics, corporate governance and so on. Thus, eleven other variables are introduced in to the model. They are financial leverage (*Lev*, the ratio of that total liabilities are divided by total assets at the end of each year), Capital expenditure (*Fixed*, the ratio of that fixed assets are divided by total assets at the end of each year), long-term profitability (*Tbq*, the ratio of that corporate market capitalization is divided by total assets at the end of each year), short-term profitability (*ROA*, the ratio of that company net profit is divided by total assets at the end of each year), company growth (*Growth*, the ratio of that the total assets are divided by the total assets at the end of each year), corporate experience curve (*Age*, years that the enterprises have been in the stock market), large shareholder governance (*Dgdcg*, the ratio of shares that the largest shareholder holds), Independent Directors (*Board,* the ratio of that the member of the independent directors are divided by the member of the board of directors), manager's compensation (*Ggxc*, natural logarithm of manger's salaries). At the same time, the industry (*Industry*) and year (*Year*) are taken as control variables.

3.3. Models

In order to verify the hypothesis, we test the effect of government subsidies on the entity over-financialization, the following empirical model is constructed.

$$Overfin = c_0 + \beta_2 Sub_{i,t} + \beta_i Control_{i,t} + \sum Industry + \sum Year + \varepsilon_{i,t} \qquad (2)$$

4. Empirical analysis

4.1. Descriptive statistics

Table 1 shows the descriptive statistical results of the main variables. The mean of *Overfin* is 0.0571, the median is 0.0285, and the standard deviation is 0.0753. They indicate that the over-financialization of China's listed company is serious, and the differences of over-financialization between entity enterprises are great. The mean of

Table 1. Descriptive statistics of variables.

Variables	Mean	Median	Max.	Min.	SD	Size
Overfin	0.0571	0.0285	0.7430	0.000001	0.0753	8458
Sub	0.0060	0.0034	0.2248	0	0.0091	8458
Lev	0.4141	0.4081	0.9907	0.0080	0.1957	8458
Fixed	0.2185	0.1880	0.9363	0.0004	0.1553	8458
Tbq	1.9825	1.5879	31.4002	0.6992	1.3296	8458
ROA	0.0441	0.0407	0.6754	−1.8591	0.0752	8458
Growth	0.1747	0.0905	47.9275	−0.7071	0.8960	8458
Age	16.2162	16	61.5833	1.0833	5.6200	8458
Dgdcg	0.3494	0.3290	0.8635	0.0300	0.1500	8458
Board	0.3729	0.3333	0.8	0.125	0.0543	8458
Ggxc	15.2327	15.2214	18.5339	12.4607	0.7383	8458

Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Sub is 0.0060, the median is 0.0034, and the standard deviation is 0.0091. They indicate that the government's financial support for entity enterprises is not greatly different.

In order to test collinearity in regression of model (2), Pearson Correlation analysis was employed. Table 2 shows the results of Pearson correlation analysis. In Table 2, Pearson correlation coefficients between all variables are much less than 0.8, they indicate that collinearity is unlikely to occur when linear regression is performed on model (2).

4.2. The impact of government subsidies on entity over-financialization

Table 3 is the regression result of the effect of the government subsidies on entity over-financialization. According to the analysis without the Control Variables, the regression coefficient of *Sub* is −0.2219, and the T-value is −2.09, and significant at 5% level. They indicate that government subsidies significantly inhibit entity over-financialization. According to the analysis with the Control Variables, the regression coefficient of *Sub* is −0.2965, and the T-value is −2.88, and significant at 1% level. They indicate that government subsidies significantly inhibit entity over-financialization. As a result, the hypothesis could be verified.

4.3. Robustness test

4.3.1. RE model, RSE test and CSE test

Table 4 shows the regression results of the Random effect model, the Robust Standard Error Test and Cluster Standard Error Test. In the Random effect model, the individual fixed Effect and time fixed effect are both controlled. At the same time, the Robust Standard Error Test and Cluster Standard Error Test are also emplemented. In the path '*Sub*→*Overfin*', regression coefficient of *Sub* is significantly negative, i.e., government subsidies significantly reduce the entity over-financialization. The result is consistent with the former conclusions in 4.1.

4.3.2. PSM method

In order to avoid the self-choice bias, the PSM method is employed to handle endogenic problems. After the PSM parallel hypothesis test, the results show that the treatment group and the control group are in balance. Furthermore, we calculate the means of the outcome variables of the treatment group and the control group which is matched respectively, and the average treatment effect of the treatment group is obtained. The average treatment effect of government subsidies is the average value of treatment effect of the Ex Ante and Ex Post government subsidy on entity over-financialization. Table 5 is the average treatment effect of government subsidies. In the matching control group, the mean of *Overfin* is reduced from 0.0759 to 0.0708, and the average processing effect is reduced from −0.0192 to −0.0141, and the T-value is −1.86, and it is significant at 10% level. The results show that after the selectivity is controlled, the government subsidies have a significant inhibitory effect on entity over-financialization.

Table 2. Pearson correlation analysis.

Variables	*Overfin*	*Sub*	*Lev*	*Fixed*	*Tbq*	*ROA*	*Growth*	*Age*	*Dgdcg*	*Board*	*Ggxc*
Overfin	1										
Sub	−0.016	1									
Lev	−0.267***	−0.101***	1								
Fixed	−0.218***	0.001	0.153***	1							
Tbq	0.130***	0.106***	−0.316***	−0.134***	1						
ROA	0.064***	0.074***	−0.313***	−0.066***	0.179***	1					
Growth	0.080***	−0.012	0.020*	−0.077***	−0.007	0.096***	1				
Age	0.077***	−0.058***	0.048***	−0.044***	−0.021*	−0.060***	−0.032***	1			
Dgdcg	−0.036***	−0.032***	0.064***	0.114***	−0.100***	0.121***	−0.004	−0.158***	1		
Board	0.034***	0.009	−0.014	−0.092***	0.016	−0.011	−0.013	−0.001	0.033***	1	
Ggxc	−0.023**	0.028***	0.105***	−0.114***	−0.069***	0.121***	−0.006	0.196***	−0.036***	0.037***	1

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Table 3. Regression of government subsidies on entity over-financialization.

Variables	Without Control Variables	With Control Variables
Sub	−0.2219** (-2.09)	−0.2965*** (-2.88)
Lev		−0.0828*** (-18.84)
Fixed		−0.0757*** (-14.39)
Tbq		0.0012 (1.56)
ROA		−0.0434*** (-3.13)
Growth		0.0286*** (9.41)
Age		0.0008*** (5.47)
Dgdcg		0.0063 (1.29)
Board		0.0281** (2.12)
Ggxc		−0.0026** (-2.41)
constant	0.0281*** (4.31)	0.1074*** (6.12)
year/industry	controlled	controlled
Adjust R^2	0.1032	0.1867
Sample Size	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Table 4. Random effect models, robust regression and cluster regression.

Variables	Random Effect	Robust	Cluster
Sub	−0.1938* (-1.76)	−0.2965*** (-2.94)	−0.2965*** (-2.59)
Lev	−0.0806*** (-16.40)	−0.0828*** (-17.11)	−0.0828*** (-14.94)
Fixed	−0.0738*** (-12.13)	−0.0757*** (-15.62)	−0.0757*** (-12.72)
Tbq	0.0014* (1.77)	0.0012 (1.27)	0.0012 (1.12)
ROA	−0.0525*** (-3.66)	−0.0434*** (-2.56)	−0.0434** (-2.41)
Growth	0.0303*** (10.03)	0.0286*** (6.21)	0.0286*** (6.05)
Age	0.0006*** (3.44)	0.0008*** (5.47)	0.0008*** (4.74)
Dgdcg	0.0060 (1.04)	0.0063 (1.29)	0.0063 (1.11)
Board	0.0287** (1.96)	0.0281** (2.14)	0.0281* (1.94)
Ggxc	−0.0024* (-1.87)	−0.0026** (-2.38)	−0.0026** (-1.96)
constant	0.1063*** (5.22)	0.1074*** (6.31)	0.1074*** (5.24)
year/industry	controlled	controlled	controlled
Adjust R^2	0.1891	0.1903	0.1903
Sample Size	8458	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Table 5. Average treatment effects of government subsidies.

Variables	Sample	Processing group	Control group	Average treatment effects	S.E.	T-stat
Overfin	Unmatched	0.0567	0.0759	−0.0192	0.0056	−3.45
	ATT	0.0567	0.0708	−0.0141	0.0076	−1.86

Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

4.3.3. Change the sample size

Since the subprime crisis in the U.S. in 2007, it quickly spread to all of the world, it also affected China's physical asset configuration to a certain extent. In order to eliminate the impact of this external environment which has impacted China's productive investment, the data of samples from 2010 to 2014 are selected and re-analyzed. Table 6 shows the regression results of effect of the government subsidies on entity over-financialization with changing sample size. The results show that government subsidies significantly and negatively affect the entity over-financialization, which do not have substantive differences with the former conclusions in part 3.1. In addition, taking the impact of the international financial crisis and the impact of the Chinese Stock Market Crash into account, the samples data from 2010 to 2014 and 2016 to

Table 6. Regression results with changing sample size.

Variables	Exclude the Impact of WFC[4]	Exclude the Impact of WFC and SMD[5]
Sub	−0.3838** (-2.28)	−0.2883*** (-2.59)
Lev	−0.0581*** (-8.01)	−0.0774*** (-16.28)
Fixed	−0.0758*** (-9.26)	−0.0734*** (-12.63)
Tbq	−0.0016 (-1.16)	0.0007 (0.77)
ROA	−0.0013 (-0.04)	−0.0415*** (-2.84)
Growth	0.0071 (1.52)	0.0290*** (8.82)
Age	0.0014*** (5.43)	0.0007*** (4.26)
Dgdcg	0.0068 (0.86)	0.0113** (2.12)
Board	0.0156 (0.70)	0.0209 (1.47)
Ggxc	−0.0037** (-2.06)	−0.0025** (-2.13)
constant	0.1058*** (3.69)	0.1037*** (5.26)
year/industry	controlled	controlled
Adjust R^2	0.2047	0.1743
Sample Size	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

2019 are employed to analyze the impact of government subsidies on the entity over-financialization. The results show that government subsidies have a significant inhibitory effect on the entity over-financialization.

4.4. The path of the effects

4.4.1. Effect of government subsidies through arbitrage

According to the above analysis, the inhibitory effect of the government subsidy on entity over-financialization is more significant. The effect path of the government subsidy on entity over-financialization could be further discussed. Government subsidies may affect the entity over-financialization by arbitrage from cross-industry, financing constraints, the sensitivity of managers' compensation which is related to performance. These paths are tested by the intermediary effect method respectively.

Table 7 shows the test results of the effect of government subsidy on entity over-financialization by arbitrage from cross-industries (government subsidies →arbitrage from cross-industries →over-financialization). In the path '*Sub→Overfin*', the regression coefficient of *Sub* is −0.3154, and the T-value is −3.06. In the path '*Sub→ROEcj*', the regression coefficient of *Sub* is −0.4379, and the T-value is −5.43. In the path '*Sub→ROEcj→Overfin*' , the regression coefficient of *Sub* is −0.2955, and the T-value is −2.87. The regression coefficient of *ROEcj* is 0.0455, and the T-value is 3.27. They show that arbitrage from cross-industries has a significant intermediary effect between government subsidies and over-financialization, i.e., government subsidies significantly reduce the arbitrage from different industries, and inhibit entity over-financialization. To a certain extent, it verifies the enterprise's arbitrage motivation, which will result in entity financialization (Akkemik & Özen, 2014; Mingrong & Shichi, 2014), i.e., in order to improve enterprise's performance, the enterprise increases the financial investment with high returns, and reduce productive investment with low returns. However, only the differences between the two returns could be reversed, the entity over-financialization could be alleviated.

Table 7. The effect of government subsidies through arbitrage.

Variables	*Sub→Fin_Overfin*	*Sub→ROEcj*	*Sub→ROEcj→Fin_Over*
Sub	−0.3154*** (-3.06)	−0.4379*** (-5.43)	−0.2955*** (-2.87)
ROEcj			0.0455*** (3.27)
Lev	−0.0776*** (-19.04)	0.1180*** (36.95)	−0.0830*** (-18.89)
Fixed	−0.0755*** (-14.35)	0.0033*** (0.81)	−0.0756*** (-14.39)
Tbq	0.0007 (0.99)	−0.0099*** (-17.46)	0.0012 (1.59)
Growth	0.0251*** (8.88)	−0.0804*** (-36.37)	0.0287*** (9.46)
Age	0.0008*** (5.29)	−0.0006*** (-5.35)	0.0008*** (5.47)
Dgdcg	0.0036 (0.74)	−0.0622*** (-16.55)	0.0064 (1.31)
Board	0.0288** (2.18)	0.0178* (1.71)	0.0280** (2.12)
Ggxc	−0.0036*** (-3.38)	−0.0210*** (-25.51)	−0.0026** (-2.38)
constant	0.1192*** (6.95)	0.2888*** (21.50)	0.1060*** (6.02)
year/industry	Controlled	Controlled	Controlled
Adjust R^2	0.1859	0.3598	0.1868
Sample Size	8458	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Table 8. The effect of government subsidies through financing constraint.

Variables	*Sub→Overfin*	*Sub→KZ*	*Sub→KZ→Overfin*
Sub	−0.3154*** (-3.06)	0.2341 (0.17)	−0.3154*** (-3.06)
KZ			0.00003 (0.04)
Lev	−0.0776*** (-19.04)	3.6412*** (68.64)	−0.0778*** (-15.27)
Fixed	−0.0755*** (-14.35)	−0.1387** (-2.03)	−0.0755*** (-14.34)
Tbq	0.0007 (0.99)	0.1967*** (20.80)	0.007 (0.96)
Growth	0.0251*** (8.88)	−0.9880*** (-26.90)	0.0251*** (8.53)
Age	0.0008*** (5.29)	−0.0001 (-0.07)	0.0008*** (5.29)
Dgdcg	0.0036 (0.74)	−1.0023*** (-16.06)	0.0036 (0.74)
Board	0.0288** (2.18)	0.3116* (1.81)	0.0288** (2.17)
Ggxc	−0.0036*** (-3.38)	−0.2902*** (-21.19)	−0.0035*** (-3.28)
constant	0.1192*** (6.95)	2.7350*** (12.26)	0.1191*** (6.88)
year/industry	Controlled	Controlled	Controlled
Adjust R^2	0.1859	0.4453	0.1858
Sample Size	8458	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

4.4.2. Effect of government subsidies through financing constraint

Table 8 shows the regression results of the effect of government subsidies on over-financialization by financing constraints (government subsidies → financing constraints → over-financialization). In the path '*Sub→Overfin*' , the regression coefficient of *Sub* is −0.3154, and the T-value is −3.06. In the path '*Sub→KZ*', the regression coefficient of *Sub* is −0.2341, and the T-value is −0.17. In the path '*Sub→KZ→Overfin*' , the regression coefficient of *Sub* is −0.3145, and the T-value is −3.06. The regression coefficient of *KZ* is −0.00003, and the T-value is 0.04. They show that government subsidies could not reduce entity enterprise's financing constraint, the intermediary effect of the financing constraint on the relationship between government subsidies and over-financialization is not significant, i.e., government subsidies cannot inhibit entity over-financialization by reducing enterprise's financing constraints. When the entity enterprise is over-financialization, its structure of financial asset is complex and relatively stable in a short time, the fluidity of financial assets is restricted, which fails to effectively alleviate the financing constraints.

Table 9. The effect of government subsidies through managers' compensation.

Variables	*Sub→Overfin*	*Sub→Ggxc*	*Sub→Ggxc→Overfin*
Sub	−0.3383*** (-3.29)	6.4578*** (6.08)	−0.3154*** (-3.06)
Ggxc			−0.0036*** (-3.38)
Lev	−0.0796*** (-19.72)	0.5590*** (13.38)	−0.0776*** (-19.04)
Fixed	−0.0749*** (-14.24)	−0.1645*** (-3.02)	−0.0755*** (-14.35)
Tbq	0.0009 (1.18)	−0.0381*** (-5.07)	0.0007 (0.99)
Growth	0.0245*** (8.70)	0.1476*** (5.06)	0.0251*** (8.88)
Age	0.0008*** (5.16)	0.0053*** (3.47)	0.0008*** (5.29)
Dgdcg	0.0036 (0.75)	−0.0099 (-0.20)	0.0036 (0.74)
Board	0.0299** (2.25)	−0.2962** (-2.16)	0.0288** (2.18)
constant	0.0693*** (7.96)	14.0371*** (155.84)	0.1192*** (6.95)
year/industry	controlled	controlled	controlled
Adjust R^2	0.1849	0.1990	0.1859
Sample Size	8458	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

4.4.3. Effect of government subsidies through managers' compensation

Table 9 shows the regression results of the effect of government subsidies on over-financialization by manager's compensation which is related performance (government subsidies → managers compensation → over-financialization). In the path '*Sub→Overfin*', the regression coefficient of *Sub* is −0.3383, and the T-value is −3.29. In the path '*Sub→Ggxc*', the regression coefficient of *Sub* is 6.4578, and the T-value is 6.08; path '*Sub→Ggxc→Overfin*', the regression coefficient of *Sub* is −0.3154, and the T-value is −3.06. The regression coefficient of *Ggxc* is −0.0036, and the T-value is −3.38. They show that the intermediary effect of managers compensation on the relationship between government subsidies and over-financialization is significant. Government subsidies inhibit entity over-financialization by increasing managers' compensation. If the returns of productive investment is low, and the return of financial investment is high, the manager often tends to invest in financial assets in order to maintain its own high salary since the manager compensation is decided by the company's performance. Government subsidies increase enterprise's performance, to a certain extent, the negative effects of returns of investment on corporate performance are reduced, which reduce managers' motivation of investment in financial assets. Thus, government subsidies increase enterprise's performance, becase managers' compensation is usually decided by the enterprise's performance, the managers' compensation also could be increased. Consequently, the entity over-financialization could be inhibited.

4.5. Further discuss

According to the analysis above in 4.4, there are two of main three paths that the inhibitory effects of government subsidy on entity over-financialization are significant, i.e., 'government subsidy → arbitrage from cross-industries→ entity over-financialization' and 'government subsidies→ managers' compensation→ entity over-financialization'. In the first path, government subsidies will increase the performance of enterprise's main business, improve the total profitability. Subsequently, the gap of returns between physical investment and investment in financial asset or real estate will be reduced, which results in decrease of the motivation of arbitrage from cross-

Table 10. Regression of government subsidies on enterprise's performance.

Variables	*Sub→zyyj*	*Sub→jrsy*	*Sub→ROA*
Sub	0.4430*** (4.87)	−0.0394* (-1.74)	0.3728*** (4.13)
Lev	−0.1220*** (-33.84)	−0.0067*** (-7.43)	−0.1301*** (-36.33)
Fixed	0.0121*** (2.61)	−0.0153*** (-13.18)	−0.0039 (-0.85)
Tbq	0.0096*** (15.02)	0.0003** (2.02)	0.0102*** (15.94)
Growth	0.0737*** (29.54)	−0.0049*** (-7.86)	0.0693*** (27.96)
Age	0.0004*** (3.13)	0.0003*** (9.10)	0.0008*** (5.89)
Dgdcg	0.0730*** (17.22)	−0.0020* (-1.86)	0.0715*** (16.97)
Board	−0.0258** (-2.20)	0.0044 (1.51)	−0.0186 (-1.60)
Ggxc	0.0228*** (24.53)	0.0007*** (3.16)	0.0236*** (25.50)
constant	−0.3014*** (-19.89)	0.0011 (0.29)	−0.3017*** (-20.04)
year/industry	controlled	controlled	controlled
Adjust R^2	0.3101	0.0909	0.3189
Sample Size	8458	8458	8458

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

industries. Consequently, the entity over-financialization could be restrained. In the second path, the government subsidies could increase the performance of enterprise's main business, improve total profitability of enterprise. Subsequently, the manger's compensation which is usually decided by the performance will be increased, which will result in the decrease of the motivation of managers' investment in financial asset. Thus, government subsidies have a significant inhibitory effect on entity over-financialization. There are two same causes in these two different paths above, i.e., government subsidies will increase the performance of the enterprise's main business and improve the profitability of enterprises. Based on these two same causes, we fourthly analyze the influence of government subsidies on performance of the enterprise's main business, financial income and return of total assets.

Table 10 shows the regression results of the effect of government subsidies on performance of enterprise. In Table 10, the path of 'government subsidy→ performance of enterprise's main business' (*Sub→Zyyj*) is regressed, the regression coefficient of *Sub* is 0.4430 and the T-value is 4.87. They indicate that government subsidy significantly increases the performance of enterprise's main business. In the path of 'government subsidy → financial income' (*Sub→Jrsy*), the regression coefficient of *Sub* is −0.0394 and the T-value is −1.74. They indicate that government subsidies reduce the financial income of enterprises. The path, i.e., 'Government subsidy →return of total assets' (*Sub → ROA*), is regressed, the regression coefficient of *Sub* is 0.3728 and T-value is 4.13. They indicate that government subsidies significantly improve the total profitability of enterprises. It is obviously that government subsidies significantly increase the performance of enterprise's main business, improve the profitability of enterprises. government subsidies have a significant inhibitory effect on the profit of enterprise's investment in financial assets.

4.6. Analysis of heterogeneity

Considering that the regression results may be affected by the different characteristics of entity enterprises, we further analyze the effect of nature of property rights, and the demand of innovation on the results.

Table 11. Property nature, demand of innovation.

	Property Nature		demand of Innovation	
Variables	state-owned	Non-state-owned	High-tech	Non-high-tech
Sub	−0.1077 (-0.71)	−0.3949*** (-2.87)	−0.4656*** (-2.61)	−0.2045 (-1.59)
Lev	−0.0788*** (-12.05)	−0.0851*** (-14.11)	−0.1131*** (-13.96)	−0.0700*** (-13.31)
Fixed	−0.0626*** (-9.78)	−0.0927*** (-11.03)	−0.1063*** (-8.54)	−0.0752*** (-12.57)
Tbq	−0.0013 (-1.00)	0.0017* (1.84)	0.0003 (0.22)	0.0021** (2.16)
ROA	−0.0031 (-0.11)	−0.0553*** (-3.45)	−0.0627*** (-2.68)	−0.0349** (-1.99)
Growth	0.0245*** (3.92)	0.0285*** (8.08)	0.0202*** (3.53)	0.0330*** (9.10)
Age	0.0014*** (5.78)	0.0006*** (3.26)	0.0005* (1.93)	0.0009*** (5.03)
Dgdcg	−0.0004 (-0.06)	0.0146** (2.07)	0.0035 (0.36)	0.0061 (1.07)
Board	−0.0004 (-0.02)	0.0410** (2.24)	0.0579** (2.43)	0.0186 (1.17)
Ggxc	−0.0055*** (-3.57)	−0.0002 (-0.16)	−0.0002 (-0.07)	−0.0032** (-2.46)
constant	0.1449*** (5.91)	0.0776*** (3.11)	0.0767** (2.36)	0.1093*** (5.34)
year/industry	Controlled	Controlled	Controlled	Controlled
Adjust R^2	0.2320	0.1674	0.1867	0.1935
Sample Size	3290	5168	2551	5907

Note: '***', '**', '*' means that it is significant at the 1% level, 5% level, and10% level respectively.
Data source: all data analyses were performed by authors with data derived from the Guotaian (CSMAR) database.

Taking the problem of Heterogeneity, Table 11 is the results of the effect of nature of property rights, and the demand of innovation on entity over-financialization. By distinguishing the different property rights, we classified samples of enterprises with over-financialization into two groups, i.e., samples of over-financialization state-owned enterprises and samples of over-financialization non-state-owned enterprises. In the samples of state-owned enterprises with over-financialization, the path is '*Sub→Overfin*', the regression coefficient of *Sub* is −0.1077, and the T-value is −0.71. In the samples of non-state-owned enterprises with over-financialization, the path is '*Sub→Overfin*', the coefficient of *Sub* is −0.3949, and the T-value is −2.87. The inhibitory effect of government subsidies on over-financialization is only significant in the group of the non-state-owned enterprises.

Taking the different levels of demands of innovation into account, we classified over-financialization samples into two groups, i.e., samples of high-tech enterprises and samples of non-high-tech enterprises. In the group of samples of high-tech enterprises, the path is '*Sub→Overfin*', the regression coefficient of *Sub* is −0.4656, and the T-value is −2.61. In the samples of non-high-tech enterprises, the path is '*Sub→Overfin*', the regression coefficient of the *Sub* is −0.2045, and the T-value is −1.59. They show that the inhibitory effect of government subsidies on over-financialization is only significant in the group of high-tech enterprises with over-financialization.

5. Conclusion, policy recommendation and limitation

5.1. Conclusion

With the background that China's economy has partly changed from entity economy to fictitious economy, which has resulted in some serious consequences But it is noticed that previous research still mainly focuses on the motivation and the economic results of the entity financialization, the topics, i.e., how to inhibit the over-financialization, has not been involved. By standing on a different perspective, we collected data from China Shenzhen-Shanghai A-share entity listed companies among 2008-2019, and

used empirical analysis to study the governance effect of government subsidies on entity over-financialization. There are three meaningful findings which are as following.

Firstly, we exploit the two significant paths of inhibitory effect of government subsidies on entity over-financialization. The first path is 'government subsidies → arbitrage from cross-industries →entity over-financialization', i.e., since the government subsidies could increase the performance of the enterprise's main business, increase the enterprise's profitability, the enterprise's arbitrage from cross-industries could be reduced. Thus, government subsidies inhibit entity over-financialization by reducing enterprise's arbitrage from cross industries. The second one is 'government subsidies →managers' compensation → entity over-financialization', i.e., since the government subsidies could increase the performance of the enterprise's main business, increasing the enterprise's profitability, managers' compensation could be increased. Thus, government subsidies inhibit entity over-financialization by increasing managers' compensation.

Secondly, the government subsidies could not inhibit entity over-financialization by alleviating financing constraints. It shows that the motivation of China's entity financialization is for arbitrage from cross-industries rather than preventive reserves.

Thirdly, the inhibitory effect of government subsidies on over-financialization are only significant in the enterprises of high-tech, non-state-owned and high demand of innovation.

5.2. Policy recommendations

According to our findings, there are four useful policy recommendations which are as following.

Firstly, government subsidies are useful means to alleviate entity over-financialization since government subsidies could reduce entity over-financialization. Enterprises will be affected by macroeconomic government policies. Innovation has the high risk and need long-term investment, enterprise will obtain a low return rate in a short time. Companies will invest in financial asset because of high financial return in short term. Moreover, the profits of the enterprise mainly rely on financial investment, which will reduce enterprise's investment in technology innovative, and cause systemic risk of finance. In order to solve such market failures, government should effectively suppress entity over-financialization by providing government subsidies.

Secondly, the government should strengthen the supports for enterprise's the development, increase the subsidies for enterprise innovation and investment in fixed asset, etc., which could improve the return of productive investment. The main cause of entity over-financialization is motives of high-profit by enterprise and managers' self-motivation. Thus, the government subsides could reduce the gap of return between entity investment and financial investment, and encourage entity enterprises to invest in the main business and increase their core competitiveness.

Thirdly, listed companies should make scientific and reasonable compensation policies. In the performance assessment for managers, it not only includes indicators of enterprise's short-term performance, and the indicators of long-term performance also should be taken into account, corporate risks and capabilities of enterprise

innovation all should be considered as well. Thus, the motivation of managers' self-interest should be suppressed, and then the rational configuration of enterprise resources could be achieved.

Fourthly, the government subsidies should be implemented according to different scenarios. Because of the heterogeneity of entity over-financialization, entity over-financialization in different scenarios should be distinguished. According to the natures of different property rights, government subsidies have only significant inhibitory effects on non-state-owned enterprises. Therefore, the government should establish different supervision mechanisms and strengthen the supervision of government subsidies. Then, the standardization and efficiency of government subsidy could be achieved. Because of different demands of innovation, government subsidies have significant inhibitory effects on over-financialization in high-tech enterprises which have high demand of innovation. But the inhibitory effects of government subsidies on over-financialization in non-high-tech enterprises are not significant. Thus, the government should carefully make polices to support high-tech enterprises with high demand of innovation and decrease the support for non-high-tech enterprises with low demand of innovation.

5.3. Limitations

Unavoidably, there are the limitations of our studies which also the future works. Three limitations of our studies are as follows.

Firstly, our studies generally analyze the influence of government subsidies on the entity over-financialization, so it lacks of in-depth studies on the mechanism of government subsidies. Government subsidies could be classified into fiscal subsidies and tax cut. there may be some different conclusions about the effect of fiscal subsidies and tax cut on enterprise's investment.

Secondly, the motivations for entity over-financialization may be diversified, such as irrational behaviors of managers and shareholder and so on. Fiscal subsidies may play a governance role in entity over-financialization by influencing irrational behaviors of managers and shareholder. We could be not study all of them.

Finally, only the static effect of government subsidies on entity over-financialization is studied in our studies. The governance effect of government subsidies on entity over-financialization may be changing dynamically. But the analyses, i.e., governance effect of government subsidies is strengthening or weakening, are not involved in our studies.

Notes

1. Resource: https://www.kylc.com/stats/global/yearly_per_country/g_manufacturing_value_added_in_gdp/chn.html
2. **Note:** government subsidies in our studies include fiscal subsidies and tax incentives. According the data, Chinese entities almost accepted different degrees of such fiscal subsidies or tax incentives. "A-Share Government Subsidies List" which is published by Shujufabuabo of Securities Times shows that more than 85% of enterprises ever accepted government subsidies from 2008 to 2019 in China. For example, 3,487 A-share listed companies accepted the government subsidies in 2018, the rate reaches 97.76% of all a-

share listed companies. In 2020, A-share listed companies which are accepted the subsidies by the government are more than 4,000, the rate is more than 98.45% of the total A-share listed companies.

3. **Note:** ST is abbreviation of "special treatment". A stock number with ST means that this company listed in China stock market is in financial trouble or other abnormal conditions. On April 22, 1998, the Shanghai and Shenzhen Stock Exchanges announced to mark special treatment to the stock transactions of listed companies with abnormal financial trouble or other conditions. Such as their stock prices are limited to 5% increase and 5% decrease per day. Moreover, the listed company with *ST keep suffering losses in last three years, an early warning of delisting is given. price of the company with*ST is also limited to 5% increase and 5% decrease per day.
4. WFC: world financial crisis in 2008.
5. SMD: the China's stock market disaster in 2015.

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References

Admati, A. R. (2017). A skeptical view of financialized corporate governance. *Journal of Economic Perspectives*, *31*(3), 131–150. https://doi.org/10.1257/jep.31.3.131

Akkemik, K. A., & Özen, Ş. (2014). Macroeconomic and institutional determinants of financialisation of non-financial firms: Case study of Turkey. *Socio-Economic Review*, *12*(1), 71–98. https://doi.org/10.1093/ser/mwt006

Arcand, J. L., Berkes, E., & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, *20*(2), 105–148. https://doi.org/10.1007/s10887-015-9115-2

Bar-Yosef, S., & Landskroner, Y. (1981). *The impact of the government on financial equilibrium and corporate financial decisions*. University of California at Berkeley.

Beck, U. (2014). *The brave new world of work*. John Wiley & Sons.

Bernini, C., & Pellegrini, G. (2011). How are growth and productivity in private firms affected by public subsidy? Evidence from a regional policy. *Regional Science and Urban Economics*, *41*(3), 253–265. https://doi.org/10.1016/j.regsciurbeco.2011.01.005

Bleck, A., & Liu, X. (2018). Credit expansion and credit misallocation. *Journal of Monetary Economics*, *94*, 27–40. https://doi.org/10.1016/j.jmoneco.2017.09.012

Cecchetti, S. G., & Kharroubi, E. (2012). Reassessing the impact of finance on growth.

Chengsi, Z., & Butan, Z. (2016). The falling real investment puzzle: A view from financialization. *Economic Research Journal*, *51*(12), 32–46.

Colombo, V. (2013). Economic policy uncertainty in the US: Does it matter for the Euro area? *Economics Letters*, *121*(1), 39–42. https://doi.org/10.1016/j.econlet.2013.06.024

Crotty, S. (2015). A brief history of T cell help to B cells. *Nature Reviews. Immunology*, *15*(3), 185–189. https://doi.org/10.1038/nri3803

Danlu, B., & Xiaoyan, W. (2014). Subsidy, soft constraint and pay gap. *Nankai Business Review*, *17*(2), 23–33.
Demir, F. (2009). Financial liberalization, private investment and portfolio choice: Financialization of real sectors in emerging markets. *Journal of Development Economics*, *88*(2), 314–324. https://doi.org/10.1016/j.jdeveco.2008.04.002
Duchin, R., Gilbert, T., Harford, J., & Hrdlicka, C. (2017). Precautionary savings with risky assets: When cash is not cash. *The Journal of Finance*, *72*(2), 793–852. https://doi.org/10.1111/jofi.12490
Ductor, L., & Grechyna, D. (2011). *Excess financial development and economic growth*. Social Science Research Network Working Paper. http://ssrn.com/abstract, 1997526.
Gehringer, A. (2013). Growth, productivity and capital accumulation: The effects of financial liberalization in the case of European integration. *International Review of Economics & Finance*, *25*, 291–309. https://doi.org/10.1016/j.iref.2012.07.015
Gleadle, P., Parris, S., Shipman, A., & Simonetti, R. (2014). Restructuring and innovation in pharmaceuticals and biotechs: The impact of financialisation. *Critical Perspectives on Accounting*, *25*(1), 67–77.
Görg, H., & Strobl, E. (2007). The effect of R&D subsidies on private R&D. *Economica*, *74*(294), 215–234. https://doi.org/10.1111/j.1468-0335.2006.00547.x
Guanchun, L. (2017). Financial asset allocations and the firms' R&D activity in China: Crowding-out or crowding-in? *Statistical Research*, *7*, 51–63.
Guanchun, L., Jun, Z., & Yuanyuan, L. (2018). Financial asset allocation, macroeconomic conditions and firm's leverage. *The Journal of World Economy*, *1*, 148–173.
Guellec, D., & V., Pottelsberghe De La Potterie, B. (2003). The impact of public R&D expenditure on business R&D. *Economics of Innovation and New Technology*, *12*(3), 225–243. https://doi.org/10.1080/10438590290004555
Guo, Y. (2018). Signal transmission mechanism of government innovation subsidy and enterprise innovation. *China Industrial Economics*, *9*, 98–116.
Guo, D., Guo, Y., & Jiang, K. (2016). Government-subsidized R&D and firm innovation: Evidence from China. *Research Policy*, *45*(6), 1129–1144. https://doi.org/10.1016/j.respol.2016.03.002
Hamel, G., & Prahalad, C. K. (1989). To revitalize corporate performance, we need a whole new model of strategy. *Strategic intent. Harvard business review*, *67*(3), 63–76.
Han, G., & Tang, X. (2019). Research on the relationship between executive incentive mode and enterprise innovation ability—based on empirical evidence of listed high-tech companies. In *2019 International Conference on Economic Management and Cultural Industry (ICEMCI 2019)*.
Harris, R., & Trainor, M. (2005). Capital subsidies and their impact on total factor productivity: Firm-level evidence from Northern Ireland. *Journal of Regional Science*, *45*(1), 49–74. https://doi.org/10.1111/j.0022-4146.2005.00364.x
Hsieh, C.-T., & Klenow, P. J. (2009). Misallocation and manufacturing TFP in China and India. *Quarterly Journal of Economics*, *124*(4), 1403–1448. https://doi.org/10.1162/qjec.2009.124.4.1403
Huang, J., Luo, Y., & Peng, Y. (2021). Corporate financial asset holdings under economic policy uncertainty: Precautionary saving or speculating? *International Review of Economics & Finance*, *76*, 1359–1378.
Jian-jun, S., & Xiao-yun, L. (2021). Government subsidies and corporate innovation capability: A new empirical finding. *Journal of Economics and Management*, *3*, 113–128. 10.1371/journal.pone.0259642.
Kleer, R. (2010). Government R&D subsidies as a signal for private investors. *Research Policy*, *39*(10), 1361–1374. https://doi.org/10.1016/j.respol.2010.08.001
Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking & Finance*, *41*, 36–44. https://doi.org/10.1016/j.jbankfin.2013.12.020

Lee, Y. S., Kim, H. S., & Hwan Joo, S. (2020). Financialization and innovation short-termism in OECD countries. *Review of Radical Political Economics*, *52*(2), 259–286. https://doi.org/10.1177/0486613419886409

Lerner, J. S., & Tetlock, P. E. (1999). Accounting for the effects of accountability. *Psychological Bulletin*, *125*(2), 255–275.

Luo, X., Huang, F., Tang, X., & Li, J. (2021). Government subsidies and firm performance: Evidence from high-tech start-ups in China. *Emerging Markets Review*, *49*, 100756. https://doi.org/10.1016/j.ememar.2020.100756

Mingrong, C., & Shichi, R. (2014). Corporate financialization: A literature review. *Finance & Economics*, *7*, 41–51.

Nerenberg, K. A., Zarnke, K. B., Leung, A. A., Dasgupta, K., Butalia, S., McBrien, K., Harris, K. C., Nakhla, M., Cloutier, L., Gelfer, M., Lamarre-Cliche, M., Milot, A., Bolli, P., Tremblay, G., McLean, D., Padwal, R. S., Tran, K. C., Grover, S., Rabkin, S. W., … Daskalopoulou, S. S. (2018). Hypertension Canada's 2018 guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults and children. *Canadian Journal of Cardiology*, *34*(5), 506–525. https://doi.org/10.1016/j.cjca.2018.02.022

Nicolini, M., & Tavoni, M. (2017). Are renewable energy subsidies effective? Evidence from Europe. *Renewable and Sustainable Energy Reviews*, *74*, 412–423. https://doi.org/10.1016/j.rser.2016.12.032

Orhangazi, Ö. (2008). Financialisation and capital accumulation in the non-financial corporate sector: A theoretical and empirical investigation on the US economy: 1973–2003. *Cambridge Journal of Economics*, *32*(6), 863–886. https://doi.org/10.1093/cje/ben009

Peng, Y., Ni, X., & Shen, J. (2018). The effect of transforming the economy from substantial to fictitious on financial market stability: An analysis on stock price crash risk. *Economic Research Journal*, *53*(10), 50–66.

Richardson, S. (2006). Over-investment of free cash flow. *Review of Accounting Studies*, *11*(2-3), 159–189. https://doi.org/10.1007/s11142-006-9012-1

Sen, S., & Dasgupta, Z. (2018). Financialisation and corporate investments: The Indian case. *Review of Keynesian Economics*, *6*(1), 96–113. https://doi.org/10.4337/roke.2018.01.06

Seo, H. J., Kim, H. S., & Kim, Y. C. (2012). Financialization and the Slowdown in Korean Firms' R&D Investment. *Asian Economic Papers*, *11*(3), 35–49. https://doi.org/10.1162/ASEP_a_00160

Shaohua, W., Zeming, S., & Qiusheng, W. (2020). How does the financialization of physical enterprises promote the enterprise innovation in the tendency of high-quality development? From the perspective of appropriateness of financialization. *Journal of Shanghai University of Finance and Economics*, *22*(3), 20–63.

Shen, C.-H., & Lee, C.-C. (2006). Same financial development yet different economic growth: Why? *Journal of Money, Credit and Banking*, *38*(7), 1907–1944. https://doi.org/10.1353/mcb.2006.0095

Shin, H.-Y. (2012). Financialization and stagnant corporate investment in Korea since the Asian Financial Crisis. Available at SSRN 2156502

Shleifer, A. (1994). Establishing property rights. *The World Bank Economic Review*, *8*(suppl 1), 93–117. https://doi.org/10.1093/wber/8.suppl_1.93

Sokol, M. (2017). Financialisation, financial chains and uneven geographical development: Towards a research agenda. *Research in International Business and Finance*, *39*, 678–685. https://doi.org/10.1016/j.ribaf.2015.11.007

Stockhammer, E. (2004). Financialisation and the slowdown of accumulation. *Cambridge Journal of Economics*, *28*(5), 719–741. https://doi.org/10.1093/cje/beh032

Stulz, R. (1981). A model of international asset pricing. *Journal of Financial Economics*, *9*(4), 383–406. https://doi.org/10.1016/0304-405X(81)90005-2

Stulz, R. M. (1996). Rethinking risk management. *Journal of Applied Corporate Finance*, *9*(3), 8–25. https://doi.org/10.1111/j.1745-6622.1996.tb00295.x

Su, K., & Liu, H. (2021). Financialization of manufacturing companies and corporate innovation: Lessons from an emerging economy. *Managerial and Decision Economics*, *42*(4), 863–875. https://doi.org/10.1002/mde.3278

Tori, D., & Onaran, O. (2017). The effects of financialisation and financial development on investment: Evidence from firm-level data in Europe. Greenwich Papers in Political Economy 16089, University of Greenwich, Greenwich Political Economy Research Centre.

Tori, D., & Onaran, Ö. (2018). The effects of financialization on investment: Evidence from firm-level data for the UK. *Cambridge Journal of Economics*, *42*(5), 1393–1416. https://doi.org/10.1093/cje/bex085

Tzelepis, D., & Skuras, D. (2006). Strategic performance measurement and the use of capital subsidies. *International Journal of Productivity and Performance Management*, *55*(7), 527–538. https://doi.org/10.1108/17410400610702133

Wang, H., Li, M-m., & Tang, T-j (2016). The driving factors of cross-industry arbitrage and its impact on innovation. *China Industrial Economics*, *11*, 73–89.

Xianhuan, H., Yao, W., & Shaohua, W. (2019). Who is more over-financialized: Firms with rising performance or firms with declining performance? *Journal of Shanghai University of Finance and Economics*, *21*(01), 80–94.

Xu, X., & Xuan, C. (2021). A study on the motivation of financialization in emerging markets: The case of Chinese nonfinancial corporations. *International Review of Economics & Finance*, *72*, 606–623. https://doi.org/10.1016/j.iref.2020.12.026

Yu, F., Guo, Y., Le-Nguyen, K., Barnes, S. J., & Zhang, W. (2016). The impact of government subsidies and enterprises' R&D investment: A panel data study from renewable energy in China. *Energy Policy*, *89*, 106–113. https://doi.org/10.1016/j.enpol.2015.11.009