

More Government Subsidies, Worse Future Earnings-Evidence from China

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This paper examines the relationship between government subsidies and future earning. Firms are more likely to achieve worse future earnings when they received more subsidies. Subsidies with lower necessity will worsen future earnings. Whichever measures we use, the more subsidies will lead to a worse future performance.

Keywords: government subsidy, future earnings, necessity, China

INTRODUCTION

China has become the second largest country in the world, with its government the most powerful one in the world. Its central government and its subordinate governments have issued numerous government fiscal and non-fiscal supplements to all companies. As an important financial instrument for local governments to support enterprises at all levels in China, the payment of government subsidies can not only have an impact on enterprises in the short term but may also have a long-term economic effect. There are many factors that affect the future accounting performance of enterprises, and the role of government subsidies on the accounting performance of enterprises after a longer period of time is not clear. As the most important companies in China, A-share listed companies have received a higher proportion of government subsidies, and it is of great significance to study the impact of government subsidies on the future long-term accounting performance of A-share listed companies in China.

Using Chinese government subsidy data to study the impact of government subsidies on the long-term performance of companies has at least three significant advantages. First, China's A-share listed companies received a large sample of government subsidies and detailed disclosure. Second, the vast majority of companies receive government subsidies that do not have an impact on corporate fundamentals, but some companies receive huge amounts of government subsidies, and the sample distribution is likely to facilitate the study. Third, while China's stock market is much to blame, the CSRC (China Security Regulatory Committee) is highly efficient and strict in its post-disclosure irregularities.

Our paper proceeds along two lines. First we show the distribution of government subsidies and test the impact of it on future earnings and then we separate firms by their corporate characters. Secondly, we provide the possible channel that may lead to this result and prove the economic consequences of subsidies.

This paper contributes to the literature as the following. First of all, we show the long-term economic consequences of government subsidies on future earnings in China. Secondly, we show the different types of subsidies and its different impact on future earnings, which may reflect their economic nature and necessity. Thirdly, we provide more evidence on the different economic results between different property rights firms.

The remaining part of this paper is organized as follows: 'Literature review and Hypothesis development' briefly reviews the accounting and economics paper on the role of subsidy and future earnings and lead to the hypothesis of this paper. 'Research Design' introduces the research method and provides the sample. 'Empirical results' presents the main findings of this paper and shows the possible channels inducing this phenomena and in the last section we conclude and make a suggestion for future research.

INSTITUTIONAL BACKGROUND

In previous studies, Bergstrom (2000) confirmed that government subsidies improved current accounting performance but subsidized companies' future earnings declined. The research results of Tzelepis and Skuras (2004) show that regional government subsidies cannot improve the operating efficiency and profitability of enterprises, but may ease the operating pressure of enterprises by alleviating the constraints of corporate cash flow. Bernini and Pellegrini (2011) research found that government subsidies will reduce the productivity and earnings of enterprises in the next period. Further, Cerqua and Pellegrini (2014) used a breakpoint regression research method to find that when SMEs received more government subsidies in the next period, their earnings performed worse in this period. In a Chinese study, Wang Kemin et al. (2014) studied the relationship between the ratio of government grants received by IPO companies before listing and the price of shares after listing, and found that the listed stocks of the companies with the highest percentage of government grants before listing performed worse. Wang Hongjian et al. (2014) used loss-making companies as a sample to find that poverty-relief behavior of state-owned enterprises or emergency rescue behavior of private enterprises in areas with low levels of local government intervention will help improve the company's future operating performance, otherwise it will reduce the company's operating results in the future period. Li Xinzi (2019) found that government subsidies reduced the operating performance of state-owned enterprises in the next period.

Most studies have theoretically supported the negative effect of government subsidies on future earnings. Faccio et al. (2006) argued that a fully efficient market was able to allocate funds where they were mostly needed and that the government's dominant allocation of government subsidy funds was likely to lead to market failure. Wang Kemin et al. (2014) pointed out that the reason for obtaining a higher proportion of government-subsidized IPO companies' poor earnings after listing may be because of their own operating condition. Many studies also infer that non-essential government subsidies distort normal market competition while not improving the company's operating conditions (He Fan and Zhu He, 2016).

The impact of different government subsidies on the future accounting performance of an enterprise may be inconsistent. The implicit assumption adopted in this article is that government subsidies with lower necessity are more likely to reduce future accounting performance. We use different methods to measure the need for government subsidies.

Based on the analysis above, we formulate the first hypothesis:

H1: Government subsidies are negatively related to future earnings. Among them, the lower the necessity of government subsidies, the stronger the negative impact on future earnings.

There are multiple considerations for the government as the main body of government subsidies. It is undeniable that the government is likely to issue more government subsidies to the companies that are related to it. Will the subsidy effected by the degree of political connection affect the efficiency of government subsidies and enterprises? What about future earnings?

Property right nature is an important feature of Chinese enterprises. For private enterprises, on the one hand, having a political connection may bring more government subsidies and more government support to enterprises (Yu Mingguai et al. ,2010), and may gain more trust and social resources as a signal of a good "relationship "(Zheng & Zhu ,2013), and we expect that such a government subsidy will help private enterprises improve their future accounting performance; On the other hand, based on the perspective of rent-seeking and conspiracy, companies may receive unnecessary government subsidies through political connections with key local officials, especially when government officials leave private companies to enter the private sector, it is more likely to result in less efficient allocation of subsidies and affect market clearing, lower motivation and productivity, in which case we will observe that obtaining such government subsidies will reduce the future accounting performance of private enterprises or will not produce a shadow. For state-owned enterprises, most previous studies have considered that state-owned enterprises have a natural political connection without further distinction, but in fact the political connections owned by different state-owned enterprises and the government subsidies obtained by such political connections are different. For example, although the secondary subsidiaries of PetroChina have created a large number of jobs in their localities, they do not contribute directly to local profits and taxes, and the direct economic value created by local government subsidies to them is far from the direct economic value created by local provincial state-owned enterprises or municipal state-owned enterprises. In fact, we can observe the local government's "stinginess" in granting government subsidies to secondary subsidiaries of such central firms. Therefore, the article argues that all state-owned enterprises can not be considered as their political ties are consistent in an one-size-fits-all way, with subsidiaries of central enterprises having less local political ties than local ones.

Based on China's national conditions and the actual situation of government subsidies, this article believes that when governments at all levels in China issue government subsidies, it is likely to be based on two coexisting motives: For companies with weak political connections, the government subsidies they provide are mainly based on the "investment-return view", that is, local governments tend to issue government subsidies to companies that operate better in the future and can continue to create profits, taxes and employment for the local government, or to enhance the performance of the major local leaders. The company will issue unnecessary government subsidies based on "relationship and propriety". Since unnecessary government subsidies will not help companies to increase their earnings in the future, this article proposes the following hypotheses:

H2: The effect of government subsidies for companies with stronger political ties on future earnings is worse than for companies with weak political connections.

RESEARCH METHOD AND SAMPLE

Method

This article uses the DID model 1 to test hypothesis 1:

$$\Delta ROA_{t+i} = \alpha_0 + \alpha_1 \Delta ROA_{t+i-1} + \alpha_2 \Delta Sub_{t+i-1} + \sum \beta \times Controls \quad (1)$$

In order to control endogeneity as much as possible, this paper uses a differential regression model. The authors examined the relationship between earnings and government subsidies in the next three years. The main regression in this part uses the return on total assets as an indicator of earnings. Dependent variable ΔROA_{t+i} is the future earnings of period i, the calculation method is to use t+i year-end net profit minus the year-end net profit difference divided by t year-end total assets, i=1, 2, 3. Independent variable ΔSub_{t+i-1} is the proportion change of the government subsidies obtained in period i in the future, and the calculation method is to use the value of government subsidies in period t+i-1 minus the difference in

government subsidies in period t-1 divided by the total assets at the end of year t, $i = 1, 2, 3$. ΔROA_{t+i-1} is the relative net profit change ratio of the previous period's net profit, and the calculation method is to use t+i-1 year-end net profit minus t-1 year-end net profit difference divided by t year-end total assets, $i=1, 2, 3$. The DID model can be used to control the endogenous problems caused by the company's own characteristics.

Controls stands for control variables. Based on existing research, the main control variables included in this article include: company size(Size), property rights(State), leverage(Lev), listing time(Age), the company's total return on assets in the previous year(ROA_{t-1}), the level of marketization(MKTI) of the company's place of registration, the price-to-book ratio(PB), the company's largest shareholder's stock ratio(CShrR), the company's stock market rate of return(RET) and the company's stock volatility(VOL).

Further, we divided the government subsidies obtained by the company into three components according to the two classification methods. We can get two different sets of data, each with three different ΔSub_{t+i-1} :

$$\Delta Sub_AF_{t+i-1}, \Delta Sub_POL_{t+i-1}, \Delta Sub_ARB_{t+i-1}$$

These are divided by government discretion; and

$$\Delta Sub_PRO_{t+i-1}, \Delta Sub_PREF_{t+i-1}, \Delta Sub_COUNTY_{t+i-1}$$

These are divided by administrative level of issuing unit. Obviously the following two equations hold:

$$\Delta Sub = \Delta Sub_AF + \Delta Sub_POL + \Delta Sub_ARB$$

$$\Delta Sub = \Delta Sub_PRO + \Delta Sub_PREF + \Delta Sub_COUNTY$$

In order to test hypothesis 2, this paper uses model 2 to verify:

$$\Delta ROA_{t+i} = \alpha_0 + \alpha_1 \Delta ROA_{t+i-1} + \alpha_2 \Delta Sub_{t+i-1} + \alpha_3 PC \times \Delta Sub_{t+i-1} + \sum \beta \times Controls \quad (2)$$

Among them, PC (Political Control) is a politically related dummy variable, which is divided into two variables: NSPC (Nonstate) and SPC (State). NSPC is a political-connected dummy variable for private enterprises. It equals to 1 when the actual controller of the enterprise has worked in the government or has served as a deputy to the Peoples' Congress or a member of the CPPCC, and otherwise it equals to 0. SPC is a political-connected dummy variable of a state-owned enterprise. It equals to 1 if the company's registered or principal place of business is local, and otherwise it equals to 0. Other control variables are consistent with equation (1). We expect that the crossover term coefficients for PC and ΔSub are significantly negative.

Sample and Data

The government subsidy data selected in this paper comes from the government subsidies in the notes to the annual financial statements of listed companies and has been manually compiled. All other data comes from the CSMAR Database. Since 2007, A-share listed companies have begun to use the "Chinese Enterprise Accounting Standards No.16-Government Subsidies (2006)". From 2008, this data is more standardized and complete. Since this article examines the return on total assets after 3 years, we select

the data as of 2015. From 2008 to 2015, A-share listed companies issued a total of 18,058 annual reports. We firstly excluded the unclear disclosure of government subsidies. After removing the missing samples from the financial industry and other regression data, a total of 13,544 valid samples were obtained. We use two classification methods for government subsidies. The first is to classify government subsidies into event, policy, and arbitrary government subsidies according to the discretion of the government to issue government subsidies. The second is the administrative unit that issues government subsidies. It is divided into government subsidies issued by administrative units at the provincial level and above, government subsidies issued by administrative units at the prefecture level and government subsidies issued by administrative units at and below the county level. Table 1 shows the classification and definition of government subsidies in this part. There are various forms of government subsidies. The authors manually collected detailed information on government subsidies disclosed in the notes of the annual report of A-share listed companies, totaling 161,257 items in 527 categories and classifying them into two classification methods.

The accounting measurement of government subsidies disclosed in the notes to the periodic financial statements should follow the requirements of "Enterprise Accounting Standards No.16-Government Subsidies", but for academic research, its economic nature should be considered. This article believes that government subsidies based on prior commitments and normal distribution afterwards are part of a company's business behavior. For companies in certain industries, such as software companies, if there is no VAT, the policy of reimbursement is in accordance with 17 % (This tax rate is 17% in our sample interval.). Most companies will fall into a loss. Therefore, software companies consider the value-added tax rate to be 3% when they decide to enter the industry or price their products. Therefore, for the software enterprises that are clearly stipulated for immediate repatriation subsidies, they should not be included in the scope of government subsidies for academic research, or they may cause some distortion.

To sum up, the method of dealing with similar government subsidies in this paper is first to find out the long-term effective management measures issued by the four State Councils. For the items pointed out in these measures, we do not consider them as government subsidies but as business activities in the analysis of regression. Then for the company level, according to the company's annual report notes, we judge by whether there's a disclosure of details and corresponding issuance documents. If there are corresponding provisions, we regard it as the contract whose agreed economic substance is recessive. If the company does not disclose the source and documents in detail, we manually search whether the government granting unit has the relevant regulations, and if there are relevant government documents or letters of intent. If so, it is also regarded as part of the normal operating contract without including this type of government subsidy in the sample of analysis of regression. To prevent the effect of the extreme values, we winsorize the continuous variables on both sides by two-tailed 1%.

TABLE 1
THE CLASSIFICATION OF SUBSIDIES

Panel A: Classification method according to government discretion	
Affair Subsidies	Government subsidies with clear production uses
Political subsidies	Policy subsidies with specific policy documents
Arbitrary subsidies	Government subsidies with neither clear production purpose nor specific policy documents
Panel B: Classification method by release level	
Subsidies issued by a provincial or higher level government	Central and ministries, provincial people's governments, deputy provincial people's governments
Subsidies issued by a prefecture level government	Provincial departments, prefecture-level municipal people's governments, national economic development zones
Subsidies issued by a county of lower level government	Relevant departments of prefecture-level cities, county-level and below people's governments

The details of our sample are presented in Table 2. As shown in the chart, The average value of return on total assets in the next one, two, and three phases (ΔROA_{t+1} , ΔROA_{t+2} and ΔROA_{t+3}) will be greater than 0 but not significant, indicating that listed companies as a whole have achieved insignificant performance improvements. The added value of government subsidies (ΔSub_{t+1} , ΔSub_{t+2} and ΔSub_{t+3}) is greater than 0, indicating that the government has indeed continued to issue more government subsidies to listed companies, but this increase is still not statistically significant. The worst performing bottom quarter companies saw their ROA drop by nearly 2% in three years. The proportion of privately-owned companies with political connections is 32.45%, which is lower than the results of Yu Minggui et al. (2010), mainly because we use the actual controller as the sole measure. The proportion of state-owned enterprises with political connections is 27.11%. In fact, almost all local state-owned enterprises have political connections locally. The total assets of listed companies still vary widely. The total number of state-owned enterprises in the sample in China is 37.82%, reflecting that with the continuous listing of private enterprises, the sample interval has formed a distribution of more private enterprises than state-owned enterprises. Judging from the ROA_{t-1} of the previous year, at least more than 75% of enterprises can still obtain a return on total assets of more than 1%. The overall corporate leverage ratio is around 46%. The maximum value of the listing age has been considerable, but the median and average have declined, reflecting the increasing number of young companies going public.

TABLE 2
THE DESCRIPTION OF MAIN VARIABLES

Variables	N	Mean	25% quantile	Median	75% quantile	Standard deviation
ΔROA_{t+1}	13544	0.0014	-0.0136	0.0010	0.0126	0.0285
ΔROA_{t+2}	13544	0.0016	-0.0128	0.0013	0.0163	0.0268
ΔROA_{t+3}	13544	0.0020	-0.0187	0.0016	0.0177	0.0329
ΔSub_t	13544	0.0009	-0.0006	0.0002	0.0016	0.0013
ΔSub_{t+1}	13544	0.0011	-0.0011	0.0005	0.0026	0.0024
ΔSub_{t+2}	13544	0.0014	-0.0017	0.0005	0.0037	0.0037
ΔROA_t	13544	0.0009	-0.0122	0.0012	0.0110	0.0161
NPC	13544	0.3245	0	0	1	0.4682
SPC	13544	0.2711	0	0	1	0.4238
MKTID	13544	0.5000	0	0.5000	1	0.5000
Size	13544	22.0832	21.1249	21.7864	22.6440	1.2816
State	13544	0.3782	0	0	1	0.4849
Lev	13544	0.4610	0.2881	0.4559	0.6416	0.2412
Age	13544	2.0327	1.3863	2.3979	2.7081	0.8127
ROA_{t-1}	13544	0.0188	0.0106	0.0162	0.0277	0.0091
MKTI	13544	6.2870	3.4400	6.0800	8.7000	2.2050
PB	13544	4.8933	2.0321	3.5455	5.9250	2.1317
CShrR	13544	0.3634	0.2623	0.3390	0.4673	0.1744
RET	13544	-0.0226	-0.2212	-0.0747	0.1835	0.1649
VOL	13544	0.1229	0.0894	0.1158	0.1424	0.0323

EMPIRICAL RESULTS

Univariate Regression

First, we report the univariate regression results of abnormal government subsidies and future performance, as shown in Table 3. Panel A in Table 3 reports the relationship between the abnormal government subsidy group and the future ROA and the possibility of loss. We divide the ratio of abnormal government subsidies scaled to the total assets of the company in the next year (ΔSub_{t+1}) into ten groups according to the decile. The first group indicates the company that has the highest percentage of abnormal government subsidies and so on, and the last group indicates that it has obtained abnormal government subsidies. For companies with the lowest subsidy ratio, the first, third and fifth columns show the ROA growth company ratio for each group of companies in T+1, T+2, and T+3 years (ROAIR, ROA Increasing Ratio, The percentage of companies in the group that increase in ROA in year T+N compared to year T), and the second, fourth, and sixth columns give the company's net profit loss ratios in T+1, T+2, and T+3 years (The percentage of loss-making companies in the group). The reason why we did not choose to deduct non-net profit or *ST (Special Treatment), which indicates that the company's operating deterioration is more intense, is based on the economic substance. The company with the highest percentage abnormal government subsidies will also become the largest *ST company in the coming year.

Assuming that the company can continue to receive government subsidies or sell losses through asset sales, it may be a way to survive. Overall, companies with a higher percentage of government subsidies will have significantly worse ROA performance than companies with lower subsidies in the next two and three years. Specifically, the group with the highest percentage of government subsidies will increase its performance in the next year by about 57%, and the group with the lowest percentage of government subsidies will increase its performance in the next year by about 80%. By the third year, the group with the highest percentage of government subsidy increased its performance by about 58%, and the group with the lowest percentage of government subsidy increased its performance by about 93%. It can be seen that, whether in the short or long term, the group with a higher percentage of government grants has a lower increase in performance than those with a lower percentage of government grants, and the gap has widened over time. In terms of the proportion of companies with a net profit loss, the group with the highest percentage of government subsidies in the current year has a significantly higher percentage of losses in the following years than the group with the lowest percentage of government subsidies. The difference in the proportion of loss-making companies is gradually increasing. In the third year, the group with the highest percentage of government subsidies suffered a loss of 11%, while in the third year, the group with the lowest percentage of government subsidies lost about 5%. In Panel B, companies with a lower percentage of government subsidies will have ROA growth rates of 0.26%, 0.37% and 0.74% separately in the next three years. Correspondingly, the company with a higher percentage of government subsidies, the ROA growth rates were 0.10%, 0.12% and 0.32%, respectively in the next 3 years. Companies with a lower percentage of government subsidies had a return on total assets of 0.42 percentage points higher after three years compared with higher companies. The results of government univariate regression partially prove that companies with higher percentages of government subsidies are less likely to increase their future performance and more likely to lose money.

TABLE 3
UNIVARIATE REGRESSION OF GOVERNMENT SUBSIDIES AND
FUTURE OPERATING PERFORMANCE

Group 1 is the top 10% of companies receiving government subsidies, Group 2 is the company receiving [80%, 90%] of government subsidies, and so on. ROAIR stands for ROA Increase Ratio. The calculation method is the percentage of companies whose ROA increases to the company quantity of the group. Loss indicates the proportion of companies that lost money. The calculation method is the percentage of companies that lost money in T + n years to the quantity of the companies in this group.

Panel A: abnormal government subsidy ranking and the possibility of future performance growth and loss						
	T+1		T+2		T+3	
	ROAIR_{t+1}	Loss_{t+1}	ROAIR_{t+2}	Loss_{t+2}	ROAIR_{t+3}	Loss_{t+3}
Group 1	56.83%	9.34%	54.17%	9.97%	57.89%	11.26%
Group 2	64.10%	9.89%	65.63%	9.44%	85.10%	9.60%
Group 3	67.49%	8.65%	73.36%	9.03%	88.26%	9.28%
Group 4	70.31%	8.07%	71.40%	8.72%	87.45%	9.07%
Group 5	67.72%	8.23%	74.29%	8.14%	90.47%	7.89%
Group 6	68.83%	8.56%	77.07%	8.19%	89.03%	8.05%
Group 7	73.26%	6.38%	82.39%	6.86%	91.87%	6.65%
Group 8	75.57%	7.03%	81.22%	6.52%	94.32%	6.40%
Group 9	78.50%	6.12%	85.03%	6.23%	92.01%	5.89%
Group 10	79.96%	5.58%	86.83%	5.19%	93.36%	4.86%
Difference between groups 1 and 10	-0.2313 ^{***} (-6.73)	0.0376 ^{***} (7.60)	-0.3266 ^{***} (-9.01)	0.0478 ^{***} (9.26)	-0.3547 ^{***} (-9.14)	0.0639 ^{***} (11.35)
N	1355	1355	1355	1355	1355	1355
Panel B: Univariate Regression of abnormal Government Subsidies and Changes in Future Earnings						
		Changes in future earnings				
		ΔROA₁	ΔROA₂	ΔROA₃		
Proportion of abnormal government subsidies	Less than median	0.0026 ^{***}	0.0037 ^{***}	0.0074 ^{***}		
	More than median	0.0010 [*]	0.0012 [*]	0.0032 ^{***}		
Difference		0.0016 ^{**}	0.0025 ^{***}	0.0042 ^{***}		
No. of samples		6772	6772	6772		

Subsidies and Future Earnings

Table 4 shows the multiple regression results of hypothesis 1 on abnormal government subsidies for future earnings changes. In either the first, second or third year, the regression coefficient of the abnormal government subsidy is significant. In terms of the impact on the third-year earnings, the abnormal government subsidy received increased by 1 percent, and the third-year earnings fell by about 0.26 percent. All the regression coefficients between ROA_{t+i} and ROA_{t+i-1} were significantly negative probably due to the mean inversion effect of the variable. For the control variables, the coefficient of leverage ratio is significantly positive, indicating that the higher the debt of the sample range, the higher the future operating performance of the enterprise may be. The coefficient of stock volatility is significantly negative, indicating that the future earnings of companies with higher stock volatility may be worse.

TABLE 4
ABNORMAL GOVERNMENT SUBSIDIES AND FUTURE EARNINGS

	ΔROA_{t+1}	ΔROA_{t+2}	ΔROA_{t+3}
ΔSub_t	-0.1327**		
ΔROA_t	-0.1691***		
ΔSub_{t+1}		-0.1843***	
ΔROA_{t+1}		-0.1785***	
ΔSub_{t+2}			-0.2616***
ΔROA_{t+2}			-0.1815***
Size	0.0003	0.0003	0.0003
State	0.0010*	0.0009*	0.0010*
Lev	0.0091***	0.0088***	0.0071**
Age	-0.0009	-0.0009	-0.0009
ROA_{t-1}	0.0014*	0.0013*	0.0013*
MKTI	-0.0002	-0.0002	-0.0001
PB	0.0001	0.0001	0.0000
CShrR	0.0413*	0.0392*	0.0401*
RET	0.0105*	0.0113*	0.0044
VOL	-0.0313***	-0.0375***	-0.0346***
Annual fixed effect	Control	Control	Control
Industry fixed effect	Control	Control	Control
Adjust R ²	9.42%	8.98%	8.43%
F value	23.6812***	20.8308***	16.4937***
No. of samples	13544	13544	13544

Further, we examined the effects of ΔSub_t , $(\Delta\text{Sub}_{t+1}-\Delta\text{Sub}_t)$ and $(\Delta\text{Sub}_{t+2}-\Delta\text{Sub}_{t+1})$ on ΔROA_{t+2} and ΔROA_{t+3} , respectively, where ΔSub_t represents the increase in the proportion of subsidies in the t^{th} year (ie, the t^{th} year relative to $t-1^{\text{th}}$ year), and $(\Delta\text{Sub}_{t+1}-\Delta\text{Sub}_t)$ represents the $t+1^{\text{th}}$ year's annual increase of the subsidy ratio, $(\Delta\text{Sub}_{t+2}-\Delta\text{Sub}_{t+1})$ represents the increase of the subsidy ratio in the $t+2$ year. Obviously the equations $\Delta\text{Sub}_{t+2} = \Delta\text{Sub}_t + (\Delta\text{Sub}_{t+1}-\Delta\text{Sub}_t) + (\Delta\text{Sub}_{t+2}-\Delta\text{Sub}_{t+1})$ and $\Delta\text{Sub}_{t+1} = \Delta\text{Sub}_t + (\Delta\text{Sub}_{t+1}-\Delta\text{Sub}_t)$ hold. In this way, we can examine the influence of ΔSub_t on ΔROA_{t+2} and ΔROA_{t+3} separately. The regression results are shown in Table 5. The proportion of abnormal government subsidies in each year after the split is still significantly negative, which proves that the negative correlation between ΔSub_{t+2} and ΔROA_{t+2} can infer the negative relationship between ΔSub_t , ΔROA_{t+2} , and ΔROA_{t+3} , and also explains whether the split will not affect the overall result. (Theoretically, the form of spin-off should be adopted, but due to the changes in total assets in each year after the split, measurement heterogeneity may occur.) In the subsequent discussions in this part, for the sake of measurement reliability and unity, we use ΔSub_t of the current year compared to the previous year as the regression variable.

TABLE 5
ABNORMAL SUBSIDIES AND FUTURE EARNINGS (SEPARATED)

	ΔROA_{t+2}	ΔROA_{t+3}
ΔSub_t	-0.1887***	-0.2403***
$\Delta\text{Sub}_{t+1}-\Delta\text{Sub}_t$	-0.2036***	-0.2731***
$\Delta\text{Sub}_{t+2}-\Delta\text{Sub}_{t+1}$		-0.2819***
ΔROA_{t+1}	-0.1763***	
ΔROA_{t+2}		-0.1689***
Control variable	Yes	Yes
Annual fixed effect	control	control
Industry fixed effect	control	control
Adjust R ²	9.16%	8.20%
F value	18.8010***	16.2983***
No. of samples	13544	13544

Further, we split the abnormal government subsidy ratio and examine the impact of different types of government subsidies on future earnings. Panel A in Table 6 shows the impact of government subsidies divided on discretionary power on future earnings, and Panel B shows the impact of government subsidies divided on administrative levels of administrative units issued on future earnings. Divided by discretion, the regression coefficients of the abnormal Subsidy Government Subsidy (Sub_AF) are 0.11, 0.07 and -0.04, respectively. If the current abnormal government subsidy increases by 1%, the earnings in the future period is expected to increase by 0.11 percentage point, which indicates that the eventual government subsidy may increase the earnings in the future period. The regression coefficients of abnormal policy government subsidies (Sub_POL) on the earnings in the next three years are not prominent, indicating that policy government subsidies have neither a positive nor a negative impact in the statistical sense, and are likely to be normal feedback for the business activities of enterprises. The regression coefficients of the abnormal arbitrary government subsidy (Sub_ARB) are all significantly negative. If the proportion of abnormal arbitrary government subsidy obtained in the current year is 1%, it

may reduce the earnings in the next year by 0.4% and the earnings in the next three years will go down 0.6%. This shows that companies with more arbitrary government subsidies are likely to decline their future earnings, and this effect can last as long as three years or more. Divided by the administrative level of the issuing unit, the regression coefficients of the next three periods of earnings on government subsidies issued by administrative units above the provincial level are 0.08, 0.10 and -0.04, of which the first two coefficients are prominent at the level of 5%. This shows that government subsidies issued by administrative units above the provincial level in statistical sense are likely to have a positive impact on the earnings in the next two years. The authors believe that on the one hand, the government subsidies issued by administrative units above the provincial level are more standardized, more prudent and more reliable; On the other hand, the government subsidies issued by administrative units above the provincial level are large and can pass to the market. Positive signals supported by the government at the government level can therefore have a more positive impact on the company's future earnings. At the same time, government subsidies issued by high-level governments may be highly positively related to industrial policies, indicating that the industry in which the company is located is supported by the government. The regression coefficient of the earnings in the next three years on the government subsidies issued by the prefecture-level and county-level administrative units and below is significantly negative, indicating that the government subsidies issued by the prefecture-level and below-level administrative units will reduce the company's future three-year earnings. The above results preliminarily confirm the hypothesis 1. Generally, government subsidies have reduced the company's future earnings, and companies that have obtained a higher proportion of arbitrary government subsidies and government subsidies issued by prefecture-level and below administrative units with the minimum necessary, their future earnings may be even worse.

TABLE 6
EXCESSIVE GOVERNMENT SUBSIDIES AND FUTURE EARNINGS IN DIFFERENT CATEGORIES

In this table, each item of ΔROA_{t+1} , ΔROA_{t+2} , ΔROA_{t+3} and the increase in government subsidy is regression analyzed. The control variables and assumptions are the same as above.

Panel A: Impact of government subsidies by discretion on future earnings

	ΔROA_{t+1}	ΔROA_{t+1}	ΔROA_{t+1}	ΔROA_{t+2}	ΔROA_{t+2}	ΔROA_{t+2}	ΔROA_{t+3}	ΔROA_{t+3}	ΔROA_{t+3}
ΔSub_AFt	0.1061***			0.0730*			-0.0414		
ΔSub_POLt	0.0312			0.0455			0.0298		
ΔSub_ARBt				-0.3978***			-0.2855***		-0.6103***
Control variable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Industry fixed effects	Control	Control	Control	Control	Control	Control	Control	Control	Control
Adjust R ²	6.78%	5.29%	8.30%	4.16%	4.05%	5.18%	4.45%	4.36%	4.88%

Panel B: Impact of government subsidies by administrative level of issuing unit on future earnings

	ΔROA_{t+1}	ΔROA_{t+1}	ΔROA_{t+1}	ΔROA_{t+2}	ΔROA_{t+2}	ΔROA_{t+2}	ΔROA_{t+3}	ΔROA_{t+3}	ΔROA_{t+3}
ΔSub_PROt	0.0831**			0.0994**			0.0327		
ΔSub_PREFt				-0.1543***			-0.1029**		
$\Delta Sub_COUNTYt$				-0.1635***			-0.2039***		-0.2417***
Control variable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control	Control	Control
Industry fixed effects	Control	Control	Control	Control	Control	Control	Control	Control	Control
Adjust R ²	7.12%	6.44%	8.55%	6.03%	5.35%	6.26%	3.98%	4.81%	5.09%

Robustness Test

Further we do some robustness test to increase credibility of results.

In the main regression, we used the differential model. We first used the undifferentiated model, that is, replaced all ΔSub_{t+i} and ΔROA_{t+i} with Sub_{t+i} and ROA_{t+i} , and examined the impact of government subsidies on future earnings. The undifferentiated model is shown in Equation (3).

$$ROA_{t+i} = \alpha_0 + \alpha_1 ROA_{t+i-1} + \alpha_2 Sub_t + \sum \beta \times Controls \quad (3)$$

Table 7 shows the regression results of formula (3). Due to space reasons, we only report the results between ROA_{t+1} and Sub_t . The results in the next two years and the next three years are similar to those in the next year. Columns 1 to 4 report the regression results between ROA_{t+1} and government subsidies divided by the government's discretion and future earnings. The proportion of government subsidy Sub is significantly negative at the level of 5%. The regression coefficient of policy government subsidy Sub_POL is not significant, and the regression coefficient of Sub_ARB is significantly negative at the level of 1%, indicating that an increase in arbitrary government subsidies will reduce future earnings. Columns 5 to 7 report the regression results between government subsidies and future earnings by administrative level of the issuing unit. Sub_PRO regression coefficients for government subsidies issued by administrative units at and above the provincial level are not significant. The regression coefficients of the government subsidies Sub_PREF and Sub_COUNTY issued by the unit are significantly negative, indicating that government subsidies issued by administrative units at the prefecture level and below will reduce future earnings. Generally speaking, government subsidies have reduced future earnings. Arbitrary government subsidies or government subsidies issued by prefecture-level cities and below have contributed to the decline in future earnings. This result is generally consistent with the regression results in the difference form. Of course, the difference result can control the endogenousness as much as possible. The authors believe that the difference result is more reliable.

TABLE 7
GOVERNMENT GRANTS AND FUTURE EARNINGS (NON-DIFFERENTIAL REGRESSION)

	ROA _{t+1}						
Sub _t	-0.1026**						
ROA _t	0.6893***	0.6025***	0.6437***	0.6358***	0.6129***	0.6269***	0.6576***
Sub_AF _t		0.0501					
Sub_POL _t			0.0619				
Sub_ARB _t				-0.1376***			
Sub_PRO _t					0.0488		
Sub_PREF _t						-0.1248**	
Sub_COUNTY _t							-0.1452**
Size	0.0002	0.0002	0.0002	0.0001	0.0003	0.0001	0.0002
State	0.0011**	0.0010**	0.0010**	0.0011**	0.0010**	0.0011**	0.0012**
Lev	0.0089***	0.0084***	0.0091***	0.0089***	0.0088***	0.0090***	0.0092***
Age	-0.0007	-0.0006	-0.0007	-0.0008	-0.0007	-0.0007	-0.0008
ROA _{t-1}	0.0011*	0.0010*	0.0010*	0.0011*	0.0012*	0.0011*	0.0012*
MKTI	-0.0001	-0.0001	-0.0001	-0.0001	-0.0002	-0.0001	-0.0001
PB	0.0001	0.0001	0.0001	0.0001	0.0000	0.0001	0.0001
CShrR	0.0353*	0.0329*	0.0337*	0.0318*	0.0335*	0.0310*	0.0326*
RET	0.0105*	0.0101*	0.0098*	0.0112*	0.0108*	0.0102*	0.0090*
VOL	-0.0313***	-0.0309***	-0.0288***	-0.0312***	-0.0297***	-0.0323***	-0.0315***
Annual fixed effect	Control	Control	Control	Control	Control	Control	Control
Industry fixed effects	Control	Control	Control	Control	Control	Control	Control
Adjust R ²	6.07%	5.88%	5.53%	6.26%	5.81%	5.66%	6.14%
F value	20.1894***	18.8315***	16.3490***	17.1735***	13.2993***	15.4096***	18.7072***
No. of samples	13544	13544	13544	13544	13544	13544	13544

Next we look at other measures of future accounting performance. In the main regression, we use ΔROA as a method to measure the future performance of the company. Further, we utilize ΔROE , cash flow from operating activities to judge whether to lose money, whether to be treated specially¹ (*ST), and other indicators of future business performance.

Among them, the authors use Logistic Regression for indicators that have been lost and specially treated by *ST, and use the probability of losses or *ST to regress, and for the ΔROE and changes in cash flow from operating activities, the authors use the company's net profit change divided by company total assets, and changes in cash flow from operating activities / company total assets respectively to represent it. The higher the company's loss and the probability of *ST, the worse the role of government subsidies; the lower the company's ΔROE and the worse the cash flow from operating activities, the worse the role of government subsidies. The right end of the regression equation is consistent with equation (1). Table 8 shows the results of regression using four different substitute indicators. From the perspective of the substitute indicators of business performance, the regression coefficients of ΔSub_t on ΔROE_{t+1} and

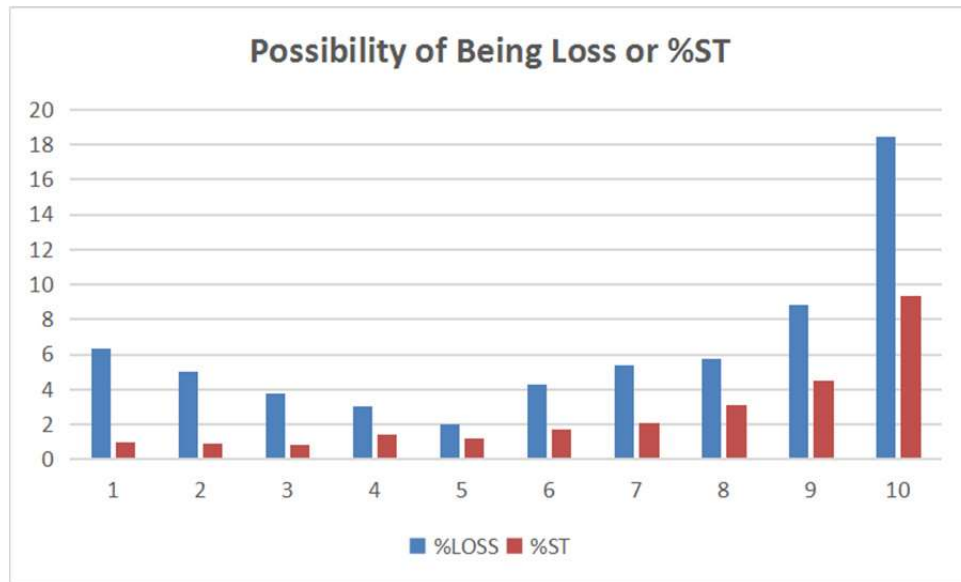
ΔCFO_{t+1} are all at the level of 1%. The coefficients are significantly negative, indicating that no matter whether ΔROA_{t+1} or ΔROE_{t+1} and ΔCFO_{t+1} are used to measure future performance, the higher the percentage of government subsidies the company receives, the more likely the future performance will deteriorate. Judging from the impact on the deterioration of the company's operations, the higher the government subsidy the company receives, the higher the increase of one unit, which may increase the company's possibility of loss in the next year by 3.55%, and increase the possibility of the company being specially dealt with by 8.03%. This result seems strange. The authors reviewed the sample distribution and analyzed it. The proportion of companies that have lost money in the sample is higher, that is, the companies that lost money in the same year even though the government helped them. In the next accounting period, the company continued to lose money and was specially treated (*ST). The authors only report the results of the next period, and the results of the next two periods and the next three periods are generally consistent.

In order to more intuitively show the relationship between the ranking of government subsidies received by the company and future losses or special treatment, we divided the government subsidies received by all companies in year T into 10 equal parts, and calculated the probability that each group would fall into losses and be *ST in year T+3. The results in Figure 1 show that in general, with the increase in the proportion of government subsidies received, the possibility of the company falling into a loss (being *ST) for two consecutive years has increased significantly. In particular, we have observed the group receiving the highest proportion of government subsidies, in which the percentage of companies that were *ST after 3 years was as high as 9.37%. Considering the continuity of the government subsidies we reported earlier, companies with a higher percentage of government subsidies are still likely to receive a higher percentage of government subsidies after 3 years. It is not difficult to infer that although the government has tried their best to help these companies, their main income performance may be worse. In the T+3 year loss group, we observed some interesting findings that companies with a lower percentage of government subsidies are less likely to lose as expected from our regression results, instead other companies in the middle group are less likely to lose money. A possible explanation for this phenomenon is that those companies which receive a lower percentage of government subsidies may indeed be the "most unloved" companies. It is understandable that the possibility of operating losses is higher.

TABLE 8
GOVERNMENT SUBSIDIES AND OTHER INDICATORS TO MEASURE THE COMPANY'S OPERATING PERFORMANCE

	ΔROE_{t+1}	ΔCFO_{t+1}	Pr(Loss _{t+1})	Pr(*ST)
ΔSub_t	-0.0415***	-0.1378***	0.0355*	0.0803**
ΔROA_t	-0.0346***	-0.0856***	0.7127**	0.6435***
Control variable	Yes	Yes	Yes	Yes
Annual fixed effect	Control	Control	Control	Control
Industry fixed effects	Control	Control	Control	Control
Adjust R ²	5.61%	6.13%	4.12%	9.38%
F Value	11.3665***	12.5104***	9.1658***	20.2622***
No. of samples	13544	13544	13544	13544

FIGURE 1
SUBSIDIES AND POSSIBILITY OF BEING LOSS THREE YEARS LATER



At the end of this section, we have some discussion on the endogeneity of the model. We are examining the impact of abnormal government subsidies on accounting performance lagging one to three periods. There may be intermediate variables such as regional fiscal capacity (Yu Minggui et al., 2010) that affect both government subsidies and regional economic development levels. The level of development may have an impact on the company's future performance. The authors use the regional fiscal deficit as the intermediate variable for the two-stage regression. The government subsidy is related to the level of the regional fiscal deficit. However, the regional fiscal deficit has no significant direct relationship with the level of regional economic development and the company's future performance. The results of the two-stage regression show that the negative impact of government subsidies on future performance is still significant.

The results we found above are not necessarily causal. Although combined with existing literature, it may be found that the company may increase investment after receiving government subsidies, which may cause the company's cash flow and operating performance to decline, but another possible explanation is that the company's own operation is about to deteriorate, and the company's management knows this in advance and actively communicates with the government to alleviate the operating crisis of the year with high government subsidies. Further, we tested whether the sudden jump in government subsidies had more significant economic consequences. As shown in Figure 1, we find that, in general, the acquisition of government subsidies has a considerable degree of inertia. So, will a sudden increase or decrease in government subsidies bring significant changes in ROA? We define that if the grouping of government subsidies has increased by 5 orders or more, for example, from group 10 to group 5 or higher, then it is called a sudden jump. If the grouping of government subsidies has dropped five or more ranks, such as a drop from Group 1 to Group 6 or lower, are called sudden drops. In Table 9, we report the test results of this effect. The results show that the proportion of government subsidies that suddenly jumped in year T will reflect the ROA which continues to deteriorate in the following three years, and in the third year, it may even make the average company's return on total assets decreased by 3.01%. The percentage of government subsidies that received a sudden decline in the proportion of government subsidies received was generally not significant, and the decline in the third year may be due to the loss of political connections of this type of company². This may indicate that if we observe a sudden increase in the proportion of government subsidies received by a company, it is likely that it will obtain a significant decline in operating performance over the next three years.

TABLE 9
BREAKPOINT REGRESSION FOR GROUPING HUGE JUMP

The rapid rise of the grouping order refers to the rise from the 10th group to the 5th group or higher and so on; the rapid decrease of the grouping order refers to the decrease from the first group to the 6th group or lower, and so on.

	The sorting of groups that received government proportions rose rapidly			The groupings of the proportion of government received has fallen rapidly		
	ΔROA_{t+1}	ΔROA_{t+2}	ΔROA_{t+3}	ΔROA_{t+1}	ΔROA_{t+2}	ΔROA_{t+3}
Mean	-0.0132***	-0.0237***	-0.0301***	-0.0021	0.0012	-0.0068*
No. of samples	327	327	327	92	92	92

Next, we use the PSM method to match the sample companies. We choose 58 groups of companies with similar assets, similar annual scale, same industry, same property rights, similar regional marketization, and the similar largest shareholder holding shares ratios, but with large differences in government subsidies, in 116 firms-year, to examine the impact of government subsidies on the company's future operating performance³, including 18 groups of state-owned enterprises and 40 groups of private enterprises. Table 10 shows the regression results after matching, using the tendency matching method. The main conclusions are consistent. A higher proportion of abnormal government subsidies will reduce future earnings. The adjusted R^2 of the sample model of state-owned enterprises is low, which may be caused by the small sample size.

Finally, the authors tested the sample by year. In all years, the negative effect of abnormal government subsidies on future earnings was established and the impact range was similar, reflecting the extremely high stability of this effect and further proof of the inhibition of abnormal government subsidies on future earnings.⁴ The moderating role of regional marketization is also consistent across all years. In the sample of 2014-2017, the strengthening of the negative relationship between political affiliation and abnormal government subsidies and future earnings has been weakened. This indicates that political affiliation may change with the anti-corruption efforts of the Party and the overall political environment since the 18th CPC National Congress,⁵ and the effect of weakened obtaining of government subsidies.

TABLE 10
PSM REGRESSION RESULTS

	ROA _{t+1}		ROA _{t+2}		ROA _{t+3}	
	State-owned enterprise	Private Enterprise	State-owned enterprise	Private Enterprise	State-owned enterprise	Private Enterprise
ΔSub_t	-0.1510***	-0.1015***				
ΔROA_t	-0.1878***	-0.1350***				
$\text{SPC} \times \Delta\text{Sub}_t$	-0.0322*					
$\text{NSPC} \times \Delta\text{Sub}_t$		-0.0411*				
ΔSub_{t+1}			-0.1803***	-0.1709***		
ΔROA_{t+1}			-0.1650***	-0.1264***		
$\text{SPC} \times \Delta\text{Sub}_{t+1}$			-0.0302*			
$\text{NSPC} \times \Delta\text{Sub}_{t+1}$				-0.0395*		
ΔSub_{t+2}					-0.1905***	-0.2274***
ΔROA_{t+2}					-0.1441***	-0.1987***
$\text{SPC} \times \Delta\text{Sub}_{t+2}$					-0.0207	
$\text{NSPC} \times \Delta\text{Sub}_{t+2}$						-0.0448**
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Adjust R ²	2.85%	8.65%	2.88%	8.19%	2.04%	7.59%
F Value	6.4348***	8.1610***	6.5652***	10.2527***	5.9018***	8.6364***
No. of samples	18	40	18	40	18	40

ANCILLARY TESTS

In this section, the authors explore the factors that may have a negative impact on government accounting subsidies to future earnings. Factors such as the company's poor management, the company's industry being not supported, and the company having received a one-time unsustainable large subsidy in the year may affect this effect. This article uses whether the company's weighted sales growth rate in the previous two years is higher than the median company's median industry peer to measure whether the company is not doing well. (Passed two years Sales Growth rate (PSGIRD).) If the company's sales growth rate is below the industry median, it is 1; Otherwise it is 0; At the same time, whether the company is in poor financial management (Financial Distress, FDD) is used to measure whether the company is not operating well; And whether its industry appears in the annual work report of the local government to measure whether the company is in an unsupported industry (Without Supporting Industry, WSID). If it does not appear, it is 1, otherwise it is 0; Subsidy Abnormal Increasing (SAID) is used to measure the continued strength of subsequent companies to obtain government subsidies. If the ratio of government subsidies obtained in the current year increased by more than 100% compared with the previous year, its value is 1, otherwise it is 0. The control variables include the total assets of the company, the age of the company, the degree of marketization in the region where the company is located, the leverage ratio, and the volatility of the company's stock. Table 11 shows the regression results of ΔSub_t for these four dummy variables. The regression coefficients are all significantly positive at the level of 1%. It can be seen that the company has been operating in a recession (possibly the market is not good or it is not actively operating), the company's industry is not supported, the company's government subsidies soared

in the year (because of the soft financial constraints, to a certain extent, the one-year assistance may be given only in one year without sustainability), etc. These circumstances may be the reason why the company received a large government subsidy in the past, and may also cause the company's future poor operation or the significant decline of the company's net profit.

TABLE 11
COMPANY-SPECIFIC CONDITIONS AND ACCESS TO GOVERNMENT SUBSIDIES

	ΔSub_t	ΔSub_t	ΔSub_t	ΔSub_t
PSGIRD	0.0009***			
FDD		0.0013***		
WSID			0.0004***	
SAID				0.0008***
Control variable	Yes	Yes	Yes	Yes
Annual fixed effect	Control	Control	Control	Control
Industry fixed effects	Control	Control	Control	Control
Adjust R ²	3.21%	2.88%	5.36%	3.35%
F Value	10.0314***	8.5665***	10.8293***	10.1042***
No. of samples	13544	13544	13544	13544

CONCLUSIONS

This paper examines the impact of different types of government subsidies on future earnings. First of all, the authors empirically tested the relationship between government subsidies and the earnings in the next three years, and found that more government subsidies did bring more negative future earnings and this effect may last for three years or more; Second, The authors follow the classification method in Table 1 and examine the impact of government subsidies divided according to discretion and government subsidies at different levels on future earnings. The results show that the negative effect of government subsidies with less purpose and higher degree of arbitrariness on the future earnings is more significant. Third, the authors examine the role of political connections in regulating government subsidies and future earnings, and introduce the concepts of state-owned enterprise political connections and private enterprises' political connections, confirming the negative effect of government subsidies of the politically connected corporate on future earnings is more intense.

This research result provides evidence for the economic consequences of subsidies, shed light on corporate disclosure and inspire both investors, managers and regulators to pay attention to such effects. Future research can move on to the other ways that local government use to affect companies in the aspects like personnel appointment, shareholding and hidden resource deployment. How to delineate the boundaries of these behaviors more clearly and measure their economic consequences more accurately is a question worthy of further exploration.

ENDNOTES

1. In our sample interval, ST said that the company has encountered major problems in its operation, but it does not necessarily mean that the company has suffered losses for two consecutive years.
2. Most are private enterprises.
3. The similarity means that the ratio of the indicators of the two companies is between $[0.6, 5/3]$. Similarly, the large difference in government subsidies refers to the ΔSub ratio of the two companies $> 5/3$.
4. Due to space limitations, the table has been omitted.
5. For example, a series of policies that may weaken political ties, such as the prohibition of officials at the deputy division level and above from serving as independent directors.

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