

# **State Ownership, Tax Status, and Size Effect of Effective Tax Rate in China**

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## **Abstract**

This paper examines how firm size, state ownership and tax status jointly affect effective tax rates. It is found that when firms do not enjoy a preferential tax status, firm size is positively correlated with effective tax rates for privately controlled firms and negatively correlated for state-controlled firms. Whether state-controlled firms pay higher or lower taxes than those non-state controlled firms depends on the firm size. For those firms that already enjoy a preferential tax status, there is no significant relationship between their size and their tax burdens.

**Keywords:** Public policy; Effective tax rate; Corporate governance; Chinese economy

**JEL classification:** G38; H25; K34; M48

## **1. Introduction**

The relationship between firm size and effective tax rate (ETR) is so important that it has received a considerable amount of interest. It has implications to the formation of corporate tax policy and tax law (Spooner, 1986; Callihan, 1994). Tax policy makers use the size-ETR relationship when assessing the impact of tax laws. Interest groups use it to affect the formation and change of tax policy. Two conflicting views about the relationship of firm size to ETR are presented in extant literature. According to the political power theory (Salamon and Siegfried, 1977), firm size and ETR are negatively correlated, while the political cost theory (Watts and Zimmerman, 1986) suggests that larger firms pay higher taxes. The empirical evidence of the relationship between firm size and ETRs is also mixed. Zimmerman (1983) finds that the fifty largest US firms in his sample experienced higher ETRs from 1969 to 1981. Rego (2003) examines 19,737 US corporations during 1990-1997 and finds the opposite relationship between firm size and ETR. Many researchers use international data and also find conflicting results (e.g. Kim and Limpaphayom, 1998; Adhikari et al., 2006).

State ownership may be another important determinant of the firm's tax burden. Tax policy is one of the major regulations the government put on the firms. When the government owns a large amount of shares, there is a close relationship between the firm and the government. As a shareholder the government gains an interest in maximizing the firm's value. Hence the state ownership may motivate the government to increase the firm's value. Lowering the corporate tax burden is one possible approach to increase the value of the firm. From a public policy perspective, on the other hand, the objective of the government is to achieve social goals including such objectives as maximizing tax revenues, increasing

employment rates and maintaining a stable society. The government may use state ownership power to direct the firm to assist in achieving these social goals. To the extent that firm value is diverted to achieve government social goals, there is a value destroying political cost for the firm. This political cost could be reflected in higher tax burdens. Therefore, the relation between state ownership and the firm's tax burden is either positive or negative. It is a pure empirical matter.

Tax incentives play a major role in attracting business and influencing business investment decisions (Buss, 2001). Countries in emerging markets often use tax incentives to attract foreign investment and to stimulate regional economies. In China, the central and local governments have provided various tax incentives to encourage domestic and foreign investment in particular regions and preferred industries (Cho and Tung, 1998). These tax incentives certainly have a strong effect on the taxes paid by those firms. However, among those firms with a preferential tax rate, does political cost or political power still play a role? There is no work on this issue in the extant research.

In fact, all these three factors, firm size, state ownership and tax status, jointly affect the ETR. Both the political cost theory and the political power theory regarding the interaction between firm size and ETR reflects the relationship between governments and corporations. Without consideration of state ownership and tax status, it is impossible to fully understand the size effect on the ETR. On the other hand, without considering the firm size, we cannot judge how state ownership affects the ETR.

In this paper, we examine the joint impact of firm size, state-ownership and tax incentives on the ETR. We find that when firms do not enjoy a preferential tax status, the political power theory explains the relationship between size and ETR for state-controlled

firms, while the political cost theory explains this relationship for privately controlled firms. That is to say that firm size is positively correlated with ETRs for privately controlled firms and negatively correlated for state-controlled firms when these firms are not subject to any preferential tax status. However, for those firms that already enjoy a preferential tax status, there is no significant relationship between firm size and the tax burdens or between state ownership and the tax burdens. On the other hand, whether state-controlled firms pay higher or lower taxes depends on firm size. Large state-controlled firms pay lower taxes than large privately controlled firms while small state-controlled firms pay higher taxes than small privately controlled ones.

This paper has several contributions to the tax research and practice. (1) Extant literature has mixed evidence on the relation between firm size and ETR. We pin down the size effect of ETR to the relationship between firms and the government, and find evidence that state ownership and tax status have a significant impact on the relation between firm size and ETR. (2) This paper has implications to the literature on the relation between state-ownership and firm value. Our findings suggest that tax levy is the channel by which the government plays the grabbing hand role and the helping hand role. The results also show that whether the government is a grabbing hand or a helping hand depends on the firm's characteristics and the relationship with the government. (3) Because of the close relationship between firms and the government in developing economies, the empirical picture about the operation of this relationship on China's ETR can help us to understand the ETR determinants in other developing countries.

The rest of the paper is organized as follows. We review the related literature and develop the hypotheses in section 2. The test design is described in section 3. Sample data

is presented in section 4 and empirical results are discussed in section 5. Section 6 concludes the paper.

## **2. Literature Review and Hypothesis Development**

### **2.1. Firm size and ETR**

Researchers agree that firms of different sizes experience differing effective tax burdens. There are differing points of view about the causes for those differences. One branch of research looks to the political implications of size on ETRs. This branch has two streams – the political cost theory and the political power theory.

The political cost theory is advanced by Jensen and Meckling (1976) who determine that larger firms face more government scrutiny. The higher visibility of larger firms causes them to become victims of greater regulatory actions by government and vehicles for wealth transfers (Watts and Zimmerman, 1986, p235). Thus large firms endure higher political costs because of their size. Since taxes are one part of the total political costs borne by firms, the political cost theory claims that larger firms have higher ETRs (Zimmerman, 1983). There has been considerable research supporting the political cost theory. Zimmerman (1983) samples fifty of the largest US firms for a period from 1969 to 1981 and finds that they experienced higher ETRs. Ronen and Aharoni (1989) find a positive association between firm size and ETR in 1979 using the data of the Fortune 1000 largest companies. Omer et al. (1993) examine the relationship between ETRs and firm size of US corporations during 1980- 1986 and obtain empirical evidence in support of Zimmerman's political cost hypothesis that large size leads to higher ETRs.

The political power theory, as advanced by Salamon and Siegfried (1977), argues that

larger firms possess superior economic and political power relative to smaller firms. Large firms have lower tax burdens because their economic and political power can be used to engage in tax-planning and manipulate the political process in their favor (Siegfried, 1972, pp. 32-36). Porcano (1986) supports this notion by finding that the largest firms have smaller average ETRs in 1982 and 1983. Rego (2003) looks at 19,737 US corporations during 1990-1997 and finds that economies of scale can significantly affect a firm's ability to reduce its tax burden through tax planning. Derashid and Zhang (2003) find a negative relationship between firm size and ETRs in Malaysia but the result is not that robust. Richardson and Lanis (2007) find a significant negative association between ETRs and firm size using the sample of publicly-listed Australian firms during the period 1997-2003.

Some other studies do not find any significant relationship between firm size and ETR. Stickney and McGee (1982) examine the extent of neutrality of the corporate income tax system by determining whether differences in average ETRs are due to systematic differences across firms related to firm size and other firm characteristics. They do not find any significant relationships exist between ETRs and firm size. Phillips (2003) investigates whether the practice of compensating chief executive officers and business-unit managers using after-tax accounting-based performance measures leads to lower ETRs and finds no significant relation between firm size and ETRs.

While the empirical evidence of the relationship between firm size and ETRs seems conflicting, Wilkie and Limberg (1990) and Kern and Morris (1992) show that these differences can be attributed to the different time periods used in each study. Gupta and Newberry (1997) also assert that the inconsistent results suggest that firm-size effects could be sample-specific and not likely to exist over time in firms with longer histories. Holland

(1998) examines the relationship between firm size and corporate tax burdens over the twenty-six year period 1968-1993 using financial data from UK non-financial firms. He finds that the result changes with the study period change. Kim and Limpaphayom (1998) examine the relation between ETRs and firm size in Hong Kong, Korea, Malaysia, Taiwan and Thailand. They find that different relationships between firm size and ETRs in different regions and/or different study periods. Obviously, the reason for different Size-ETR relationships is still an open question. We are going to investigate this Size-ETR relationship from the perspective of state ownership and tax status.

## **2.2. State ownership and ETR**

Extant literature has examined the effect of the government on corporate performance (Shleifer and Vishny, 1998; Che and Qian, 1998; Shirley and Walsh, 2000; Fan et al., 2007). These results are conflicting. Some research finds that state-controlled firms are disadvantaged in terms of performance. The inferred reason is that the objective of government is to maximize social benefit while the objective of a firm is to maximize its profit. State ownership provides the government with an opportunity to interpose social objectives in place of profit objectives. Because of this conflict of interest, rent seeking and expropriation are the major means by which the government may interfere with a firm (Stigler, 1971; Spiller, 1990; Shleifer and Vishny, 1998). In particular, Fan et al. (2007) find that the government could make the firm undertake certain social responsibilities or require them to pay the personal expenses of government officials. Boycko et al. (1996) find that state-controlled firms often hire many employees to increase the social employment rate without considering their profit maximization. Krueger (1990) finds that state-controlled firms often hire employees with government backgrounds rather than competent employees.

All of these behaviors hurt the firm's value. However, some other researchers find the opposite results. Blanchard and Shleifer (2000) believe that the economic performance difference between the Russian and Chinese economies since 1989 comes from the different quality of the two governments. Che and Qian (1998) believe that state ownership can help to reduce government intervention and expropriation. In a word, for firms, the government can be either a grapping hand, or a helping hand, or both.

Corporate tax is one of the channels by which the government affects firm performance. As for the relationship between state ownership and firm tax burdens, Derashid and Zhang (2003) examine the differing tax burdens among different industries using public firms in Malaysia from 1990 to 1999. They use state ownership as a control variable affecting tax burdens but do not find any significant relationship between state ownership and tax burdens. Wu et al. (2007) do not find a significant relationship in a study that uses state ownership as a control variable to investigate the firms' responses to tax policy changes in China in 2002. Because the focus of these studies is not the relationship between state ownership and tax burdens, their results deserve further investigation. Adhikari et al. (2006) explicitly examine this relationship using publicly traded firms in Malaysia from 1990 to 1999. They find a significantly negative relationship, i.e. state ownership hurts firm values. It is not clear whether this negative relationship holds in other countries, or whether there are other factors affecting this relationship, such as firm size and tax status.

### **2.3. Tax status and ETR**

Many countries use tax incentives to varying degrees and empirical research finds that different tax regimes actually have differing tax burdens. For example, Gupta and Mills

(2002) show that US firms that operate in multiple states can lower their ETRs by using differences in state income tax regimes. For developing economies, tax incentives are often used to attract foreign investment and advanced technology, to stimulate regional economies, or to promote certain industry sectors (Kim and Limpaphayom, 1998). Derashid and Zhang (2003) explicitly test the industrial hypothesis. Using Malaysian corporate data from 1990 to 1999, they find that manufacturing firms and hotels pay significantly lower taxes and interpret this to be a result of the tax policy undertaken by the government.

China central and local governments have greatly relied on tax incentives to stimulate regional and industrial development. For example, *the 1993 Acting Regulation on Corporate Income Tax in China* states that the regular corporate income tax rate is 33%. The central government provides preferential tax incentives in various regions and for specific industries. A preferential tax rate of approximately 15% applies in the five special economic zones (*Shenzhen, Zhuhai, Shantou, Xiamen, and Hainan*), 32 economic and technology development zones, 13 free trade zones, and 52 high-tech development zones. Meanwhile local governments also provide various tax rebates to stimulate local economic development. Wu et al. (2007) find that the effective tax burden of firms with a preferential tax rate is lower than those firms without preferential tax treatment, no matter whether the preferential rate comes directly from the central government or indirectly through local governments.

All of this research finds that the lower the nominal tax rate, the lower the effective tax burden. However, this research has focused on the total effect of differing nominal tax rates. None of the research has focused on the marginal effect. The research questions presented is how the nominal tax rates affect the relationship of firm size to ETR and/or the relationship

of the degree of state ownership of the firm to ETR.

#### **2.4. Hypothesis development**

According to the literature regarding the relationship between the government and firm valuation, whether the government is a grasping hand or a helping hand depends on the firm's characteristics and its relationship with the government. This argument can be applied to the size effect on ETRs. The political cost theory believes that larger firms face more government scrutiny, while the political power theory contends that large firms can use more economic and political power to engage in tax-planning and to manipulate the political process in their favor. Which of these forces plays the dominant role depends on the firm's relationship with the government. If the firm has a close relationship with the government, it is more likely that its lobbying activities can bring preferential results. Undoubtedly, a high degree of state ownership usually generates a close relationship between the government and the firm. Hence for large firms, the higher degree the state ownership, the larger the lobbying power the firm has. In this case, the government is a helping hand; as a result, the ETR is lower.

Besides the lobbying channel, big firms with higher degree of state ownership may pay less tax because of compensation for their contribution to the social welfare. In China, large state-controlled firms are often expected to undertake activities to contribute to social stability, such as curbing inflation or reducing high unemployment rates. To compensate them, the government may provide some implicit tax benefits. Both the lobbying channel and compensation channel suggest that for those firms with a large proportion of state ownership, firm size is negatively correlated with ETRs. Accordingly, we hypothesize:

**Hypothesis 1: For the state-controlled firms without a preferential tax status,**

**firm size is negatively correlated with their ETRs.**

For those firms without a high degree of state ownership, even though large and capable of allocating substantial lobbying resources, the lack of a close connection with the government may cause their lobbying ineffective. On the contrary, these large firms may face more government scrutiny. As a result, their tax burdens may be heavier. Therefore, the political cost theory rather than the political power theory is more likely to fit non-state controlled firms. For non-state controlled firms we hypothesize:

**Hypothesis 2: For the non-state controlled firms without a preferential tax status, firm size is positively correlated with their ETRs.**

The above argument regarding the relationship between state ownership, firm size and ETR does not consider the marginal tax rates applicable to the company, which we call tax status. As reviewed above, variable tax status exists in many economies, especially in emerging markets. Intuitively, if a firm has already enjoyed a preferential tax rate, there is less opportunity for political power to further reduce the tax rate. Hence we would not expect a positive relationship between firm size and ETR. On the other hand, a firm with a preferential tax rate is usually in a region or industry that is under higher priority for economic development. In this case, even though a larger firm may have higher visibility, this does not necessarily cause them to attract greater regulatory attention by the government. Accordingly, we would not expect to find a negative relationship between size and ETR. In a word, if a firm already enjoys a preferential tax rate, we will not observe any size effect or ownership effect on the ETR. Accordingly, we hypothesize:

**Hypothesis 3: For the firms with a preferential tax status, whether state-controlled or not, there is no significant correlation between firm size and**

**ETR.**

### **3. Empirical Model**

To investigate how the three factors, firm size, state ownership and tax status, jointly affect the ETR, we run the following ordinary least square regression model for the preferential tax sample and the non-preferential tax sample, respectively.

$$, \quad (1)$$

where ETR is the effective tax rate. ETR is commonly used to proxy corporate tax burden (Porcano, 1986; Shevlin and Porter, 1992; Gupta and Newberry, 1997). It is defined as (tax expense-deferred tax expense)/profit before interest and tax (Porcano, 1986). Size is measured by the natural logarithm of total assets. GC is the dummy variable representing state ownership. If a firm is directly or indirectly controlled by the government, GC equals 1, and 0 otherwise. SIZE\*GC is the interaction term of SIZE and GC. In the regression equation,  $\beta_1$  represents the relationship between firm size and ETR for the firms not controlled by the government.  $\beta_2$  represents the additional effect of firm size on the tax burden for firms controlled by the government, i.e.,  $\beta_1 + \beta_2$  represents the relationship between firm size and ETR for firms controlled by the government. For firms without a preferential tax status, according to hypotheses 1 and 2, state-controlled firms' size should be negatively correlated with their ETRs, while non-state controlled firms' size should be positively correlated with their ETRs. Hence we expect  $\beta_2$  to be significantly positive,

and  $\beta_3$  are expected to be significantly negative. For firms with a preferential tax status, according to hypothesis 3, firm size should not be significantly correlated with ETRs. Hence we expect that  $\beta_4$ ,  $\beta_5$  and  $\beta_6$  will not be significant.

Based on extant studies, we also control for leverage, capital intensity, inventory intensity, profitability and growth. Leverage (LEV) is defined as total liabilities divided by total assets. Because interest expense is deductible for tax purposes in China, firms with higher leverage should have lower ETRs. Alternatively, a positive relation between ETRs and leverage is possible if firms with high marginal tax rates are more likely to use debt financing. Stickney and McGee (1982) find that a firm's leverage has a significant negative relation with ETR. Gupta and Newberry (1997) find that the coefficient can be either negative or insignificant if different measures of ETR are used.

Capital intensity (CAPINT) is defined as net fixed assets divided by total assets and inventory intensity (INVINT) is defined as net inventory divided by total assets. These are measures of a firm's asset mix as used in Gupta and Newberry (1997). They argue that capital intensity may reduce a firm's ETR because of tax-deductible accelerated depreciation relative to the actual asset lives, and inventory intensity is a substitute for capital intensity and it should be positively correlated with ETRs. Their results suggest a negative relation between capital intensity and ETRs, and a positive relation between inventory intensity and ETRs. Derashid and Zhang (2003) find a negative relationship between capital intensity and ETRs, but no relationship between inventory intensity and ETRs.

Growth (GROWTH) is defined as the difference between total assets and lagged total assets divided by lagged total assets, and profitability (ROA) is defined as profit before tax

divided by total assets. Spooner (1986) argues that the swings in corporate ETRs from one year to another can be explained by changes in growth and profitability. However, the empirical evidence is rather mixed. Gupta and Newberry (1997), Kim and Limpaphayom (1998), and Derashid and Zhang (2003) all show that coefficients for growth and profitability are very sensitive to the periods of study and measures of ETR.

When we run the regression for the preferential tax sample, we also control for the nominal tax rate (RATE). In China, the ordinary nominal corporate income tax rate is 33%. But for various reasons, many firms get a preferential tax treatment. There are three preferential tax rates, 15%, 18% and 24%. The rate that applies to a firm depends on firm characteristics such as location, industry or technology. It is reasonable to say that higher nominal tax rates leads to higher ETRs.

#### **4. Sample and Descriptive Statistics**

The Chinese government made significant reforms to accounting standards before 1998 after which standards have been relatively stable. Hence our sample covers a relatively stable period from 1998 through 2006. We examine all non-financial public companies listed in China's A-share market. Because we need to use the previous year accounting data to calculate the ETR, our data actually begins from 1999, and does not include the firms that listed in the current year. All data are from JuYuan database. If the firm did not explicitly indicate its nominal tax rate in its annual report, we delete the sample. Furthermore, to obtain a meaningful measure of ETR, we eliminate firms with (1) negative profit before interest and tax, or (2) ETR is greater than one or less than zero, as suggested in previous studies (e.g.,

Gupta and Newberry, 1997; Kim and Limpaphayom, 1998; Singh et al., 1987; Stickney and McGee, 1982; Zimmerman, 1983).

Table 1 reports the sample distribution. Based on the above screening criteria, our final sample includes 5483 firm-year observations. Among them, preferential tax status and non-state controlled firm-year (PT-NGC) has 746 observations, Preferential tax status and state-controlled firm-year (PT-GC) has 2387 observations, Hence the total number of observations for preferential tax status is 3133 (746+2387), which means that more than half the firms obtain a preferential tax treatment. The firm-year observations for non-state controlled and non-preferential tax status (NPT-NGC) is 740, the firm-year observations for state-controlled and non-preferential tax status (NPT-GC) is 1610. The total number of observations for state-controlled firm-year is 3997 (2387+1610), which means that more than half of the public listed firms are controlled by the state in China. This is consistent with the development of the Chinese stock market. One of the major reasons to establish a stock market in China was to provide financing and to enhance corporate governance for state owned enterprises.

It is worth noticing two features in the yearly distribution. First, the number of observations increases as time passes. This is because China's stock market is an emerging market that has been rapidly developing in the last decade. Second, the ratio of firms with preferential tax status to the total number decreased significantly in 2002. Before 2002, the Chinese central government granted firms from different regions or industries a preferential tax rate. The central government found that its tax policy was compromised because local governments, competing with each other for capital investments, offered large tax rebates. The policy of first levying and then rebating taxes was introduced by local governments to

attract capital investment. The use of this tax rebate policy by an alarming number of local governments coupled with the continuing imbalance of industrial structure prompted the central government to issue a formal ruling that prohibited local governments from providing local tax rebates. Consequentially, many firms lost their tax advantaged status in 2002.

### **Insert Table 1 Here**

Table 2 summarizes the data. For the full sample, the mean of ETR is 0.1016, the maximum is 0.983 and the minimum is 0. All ETRs are within the interval of [0,1] because of our screening criteria. The average firm size (SIZE) is 20.9945, and average leverage (LEV) is 0.4355. But the maximum leverage is 91.0762 while the minimum leverage is 0.0001. This indicates that there is large variation in the firms' leverages. For ROA, the mean is 0.0552, the maximum is 3.6474 and the minimum is 0. There is no observation with loss firms because we delete those firms to get a meaningful ETR calculation. The means for CAPINT and INVINT are 0.2457 and 0.0905, respectively. The mean, minimum and maximum of GROWTH are 0.1579, -0.6727 and 10.3920. We can see that there are large variations in the growth rate of firms, and some firms are actually shrinking.

Panel B to Panel E in Table 2 report the descriptive summary for four sub-samples respectively: preferential tax status and non-state controlled (PT-NGC), preferential tax status and state-controlled (PT-GC), non-preferential tax status and non-state controlled (NPT-NGC), non-preferential tax status and state-controlled (NPT-GC). Except the ETR, there are no other systematic differences among the full sample and four sub-samples. The average ETRs for PT-NGC firms and PT-GC firms are 0.0613 and 0.0840 respectively, while the average ETRs for NPT-NGC firms and NPT-GC firms are 0.1044 and 0.1451 respectively. It is obvious that the tax burdens of firms without preferential tax treatment are

higher than those with preferential tax treatment. This is expected since the ordinary tax rate is 33% while the preferential tax rate is 24% or lower.

**Insert Table 2 Here**

## **5. Regression Results**

The regression results for model (1) are presented in Table 3. We use the full sample first. As expected, the parameter for RATE is significantly positive, which means that firms with higher nominal tax rates pay more taxes. The significantly positive estimator for SIZE parameter indicates a positive size effect of ETR, i.e., larger firms pay more taxes because political cost is dominant over political power for the full sample. The parameter for GC is significantly positive. The parameter for the interaction term of SIZE and GC is significantly negative, which means that the additional size effect on ETRs caused by state ownership is negative. The net size effect ( ) is also negative (-0.0034). This means that even though GC firms pay more taxes in general, large GC firms pay less tax. This is consistent with the argument in section 3.

**Insert Table 3 Here**

For the control variables, similar to Stickney and McGee (1982), we find a negative coefficient for the leverage variable, which means that the interest paid by firms helps to reduce their tax burden. The parameters for ROA and INVINT are significantly positive, a finding consistent with that reported in Gupta and Newberry (1997). The parameter for CAPINT is also significantly positive, which is consistent with Wu et al. (2007).

To further investigate the interaction of tax status with state ownership and firm size, we run the regression on two sub-samples: firms with or without preferential tax status in order to determine whether there is any difference between these two sub-samples. It is interesting

to note that the regression results for the sub-sample without preferential tax status are qualitatively similar to the full sample, but the parameters for SIZE, GC, and their interaction term are no longer significant for the sub-sample with preferential tax status. This means that the size effect and the state ownership effect observed in the full sample regression come from the sub-sample without preferential tax status. For all those firms which already obtain preferential tax treatment, there is no ETR difference based on their sizes or their level of state ownership. This supports hypothesis 3.

To see the size effect difference between GC firms and NGC firms more clearly, we further divide the non-preferential tax sample into two sub-samples, NPT-NGC and NPT-GC, and run regressions. The results are shown in Table 3. It is clear that the size effect is significantly positive for the non-state controlled firms and significantly negative for state-controlled firms. These results show that the political power theory fits the state-controlled firms, while the political cost theory fits the non-state controlled firms. This is consistent with hypotheses 1 and 2.

To check the robustness for the above results, we use other methods to calculate the ETR and repeat the regressions. In particular, ETR2 is defined as tax expense/profit before interest and tax. ETR3 is defined as tax expense/(pre-tax profit - (deferred tax expense/statutory tax rate)). ETR4 is defined as (tax expense - deferred tax expense)/(pre-tax profit - (changes in deferred tax/statutory tax rate)). Similarly, we delete those firm-year observations if their ETR calculation is meaningless based on the same criteria we used in section 3.

Table 4 reports the regression results for the firms without preferential tax status using ETR2, ETR3 and ETR4 to proxy the ETR. As above, the SIZE parameter is significantly

positive for NPT-NGC firms, while it is significantly negative for NPT-GC firms. Table 5 reports the regression results for the firms with preferential tax status using ETR2, ETR3 and ETR4 to proxy the ETR. Also, there is no significant size effect or state ownership effect of ETR for these firms. As for the control variables, they are all qualitatively similar to those in the base regression (Table 3).

**Insert Table 4 Here**

**Insert Table 5 Here**

## **6. Conclusions**

The relationship between firm size and ETR is so important that it has received a considerable amount of interest. Both the political cost theory and the political power theory regarding the relationship between firm size and ETR reflect the relationship of the government and corporations. Without consideration of other political issues between firms and the government, it is impossible to fully understand the size effect on ETRs. In China, two important factors affecting the relation between firms and the government are the level of state ownership and the availability of a preferential tax status.

In this paper, we examine how three factors, firm size, level of state ownership and tax status jointly affect the ETR. We find that when firms do not enjoy a preferential tax status, the political power theory explains the ETR for state-controlled firms, while the political cost theory explains the ETR for privately controlled firms. That is to say that the firm size is positively correlated with the ETR for private controlled firms and negatively correlated for state-controlled firms if these firms are not subject to any preferential tax status. On the other hand, state-controlled firms do not necessarily pay higher or lower taxes than non-state controlled firms; this relationship depends on the firm size. Large state-controlled

firms pay lower taxes than large private controlled firms while smaller state-controlled firms pay higher taxes than small private controlled ones. For those firms which already enjoy preferential tax status, we find that there is no significant relationship between size and ETRs. The possible reason for this is that those firms already secure a preferential tax treatment, there is no reason for the government to give them any implicit tax benefit. Furthermore, those firms are usually in a region or industry that is under higher priority for economic development, therefore the government would not increase their tax burdens.

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**Table 1: Sample distribution**

	1999	2000	2001	2002	2003	2004	2005	2006	Total
PT-NGC sample	53	34	46	87	103	125	114	184	746
PT-GC sample	255	199	239	308	336	342	337	371	2387
NPT-NGC sample	3	13	10	85	111	155	155	208	740
NPT-GC sample	9	16	26	260	300	329	334	336	1610
Total	320	262	321	740	850	951	940	1099	5483

PT-NGC sample includes firms that had preferential tax rate and are not controlled by government. PT-GC sample includes firms that had preferential tax rate and are controlled by government. NPT-NGC sample includes firms that had no preferential tax rate and are not controlled by government. NPT-GC sample includes firms that had no preferential tax rate and are controlled by government.

**Table 2: Descriptive statistics**

	Mean	Standard Deviation	Median	Minimum	Maximum
Panel A: Full sample					
ETR	0.1016	0.1147	0.0729	0.0000	0.9830
SIZE	20.9945	0.9423	20.9174	15.3944	26.9766
LEV	0.4355	1.4673	0.3917	0.0001	91.0762
ROA	0.0552	0.0687	0.0448	0.0000	3.6474
CAPINT	0.2457	0.1915	0.2115	0.0000	0.9488
INVINT	0.0905	0.1083	0.0591	0.0000	0.8359
GROWTH	0.1579	0.3455	0.0861	-0.6727	10.3920
Panel B: PT-NGC sample					
ETR	0.0613	0.0771	0.0317	0.0000	0.6770
SIZE	20.6579	0.8740	20.6227	16.5509	24.0041
LEV	0.4928	2.0387	0.3980	0.0040	55.1906
ROA	0.0616	0.1400	0.0483	0.0003	3.6474
CAPINT	0.1785	0.1564	0.1400	0.0000	0.8684
INVINT	0.0717	0.0958	0.0365	0.0000	0.8359
GROWTH	0.1963	0.3570	0.1038	-0.6727	3.2435
Panel C: PT-GC sample					
ETR	0.0840	0.0935	0.0693	0.0000	0.9641
SIZE	21.1097	0.9280	20.9995	18.2701	25.1011
LEV	0.3786	0.2997	0.3605	0.0006	10.4657
ROA	0.0555	0.0460	0.0471	0.0000	0.4688
CAPINT	0.2423	0.1851	0.2112	0.0000	0.9414
INVINT	0.0978	0.1087	0.0681	0.0000	0.8006
GROWTH	0.1476	0.2946	0.0823	-0.6236	3.2124
Panel D: NPT-NGC sample					
ETR	0.1044	0.1212	0.0484	0.0000	0.8907
SIZE	20.6455	0.7932	20.6609	17.5200	23.2879
LEV	0.4597	0.4885	0.4213	0.0076	8.5822
ROA	0.0537	0.0446	0.0453	0.0002	0.3328
CAPINT	0.2222	0.1817	0.1879	0.0000	0.9266
INVINT	0.0806	0.1081	0.0477	0.0000	0.8168
GROWTH	0.1945	0.5369	0.1020	-0.6250	10.3920
Panel E: NPT-GC sample					
ETR	0.1451	0.1386	0.1270	0.0000	0.9830
SIZE	21.1399	0.9780	21.0466	15.3944	26.9766
LEV	0.4822	2.2715	0.4245	0.0001	91.0762
ROA	0.0524	0.0541	0.0397	0.0002	1.1503
CAPINT	0.2929	0.2074	0.2558	0.0000	0.9488
INVINT	0.0931	0.1119	0.0609	0.0000	0.7621
GROWTH	0.1387	0.2911	0.0812	-0.5641	4.2237

ETR is defined as (tax expense-deferred tax expense)/profit before interest and tax. Size is measured by the natural logarithm of total assets. Leverage is defined as total liabilities divided by total assets. ROA is defined as profit before tax divided by total assets. CAPINT is defined as net fixed assets divided by total assets. INVINT is defined as net inventory divided by total assets. GROWTH is defined as the difference between total assets and lagged total assets divided by lagged total assets. PT-NGC sample includes firms that had preferential tax rate and are not controlled by government. PT-GC sample includes firms that had preferential tax rate and are controlled by government. NPT-NGC sample includes firms that had no preferential tax rate and are not controlled by government. NPT-GC sample includes firms that had no preferential tax rate and are controlled by government.



**Table 3: Regression analysis**

	Full sample		PT sample		NPT sample		NPT-N
	Estimate	t value	Estimate	t value	Estimate	t value	Estimate
Intercept	-0.2659	-3.95***	-0.0560	-0.73	-0.3220	-2.82***	-0.2271
RATE	0.2452	16.82***	0.1864	5.37***			
SIZE	0.0105	3.22***	0.0023	0.63	0.0144	2.61***	0.0109
GC	0.3004	3.92***	0.0832	0.96	0.5072	3.85***	
SIZE*GC	-0.0139	-3.75***	-0.0036	-0.86	-0.0234	-3.70***	
LEV	-0.0055	-5.51***	-0.0049	-3.17***	-0.0109	-7.57***	-0.0254
ROA	0.1961	9.16**	0.0494	2.46**	0.7284	13.27***	0.6036
CAPINT	0.1372	16.56***	0.0908	9.39***	0.1877	13.77***	0.1632
INVINT	0.2147	15.10***	0.1426	8.93***	0.3122	12.80***	0.3198
GROWTH	0.0179	4.34***	0.0055	1.09	0.0178	2.72***	0.0162
Year effect	controlled		controlled		controlled		con
Industry effect	controlled		controlled		controlled		con
F value	41.01***		12.49***		27.74***		9.
Adj R-sq	0.203		0.114		0.256		0
No. of Obs.	5483		3133		2350		

The dependent variable is ETR. It is defined as (tax expense-deferred tax expense)/profit before interest and tax. RATE is the nominal tax rate. Size is measured by the natural logarithm of total assets. GC is a dummy variable. If the firm is controlled by government, then GC=1, GC=0 otherwise. SIZE\*GC is the interaction term of SIZE and GC. LEV is defined as total liabilities divided by total assets. ROA is defined as profit before tax divided by total assets. CAPINT is defined as net fixed assets divided by total assets. INVINT is defined as net inventory divided by total assets. GROWTH is defined as the difference between total assets and lagged total assets divided by lagged total assets. PT sample includes PT-NGC sample and PT-GC sample. PT-NGC sample includes firms that had preferential tax rate and are not controlled by government. PT-GC sample includes firms that had preferential tax rate and are controlled by government. NPT sample includes NPT-NGC sample and NPT-GC sample. NPT-NGC sample includes firms that had no preferential tax rate and are not controlled by government. NPT-GC sample includes firms that had no preferential tax rate and are controlled by government. \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level

**Table 4: Regression analysis**

	ETR <sub>2</sub>				ETR <sub>3</sub>			
	NPT-NGC sample		NPT-GC sample		NPT-NGC sample		NPT-GC sample	
	Estimate	t value	Estimate	t value	Estimate	t value	Estimate	t value
Intercept	-0.2332	-2.16**	0.1356	1.88*	-0.2342	-2.16**	0.1539	2.10**
SIZE	0.0112	2.17**	-0.0068	-2.00**	0.0112	2.17**	-0.0075	-2.17**
LEV	-0.0249	-3.01***	-0.0102	-6.49***	-0.0252	-3.04***	-0.0103	-6.45***
ROA	0.5980	6.63***	0.7248	10.53***	0.5972	6.59***	0.7294	10.46***
CAPINT	0.1654	6.91***	0.1967	12.06***	0.1676	6.96***	0.1965	11.89***
INVINT	0.3215	8.65***	0.2701	8.44***	0.3214	8.62***	0.2718	8.38***
GROWTH	0.0169	2.29**	0.0188	1.71*	0.0168	2.27**	0.0179	1.61
Year effect	controlled		controlled		controlled		controlled	
Industry effect	controlled		controlled		controlled		controlled	
F value	9.78***		17.85***		9.70***		17.42***	
Adj R-sq	0.274		0.251		0.273		0.246	
No. of Obs.	745		1614		744		1612	

ETR<sub>2</sub> is defined as tax expense/profit before interest and tax. ETR<sub>3</sub> is defined as tax expense/(pre-tax profit - (deferred tax expense/statutory tax rate)). ETR<sub>4</sub> is defined as (tax expense - deferred tax expense)/(pre-tax profit - (changes in deferred tax/statutory tax rate)). Size is measured by the natural logarithm of total assets. LEV is defined as total liabilities divided by total assets. ROA is defined as profit before tax divided by total assets. CAPINT is defined as net fixed assets divided by total assets. INVINT is defined as net inventory divided by total assets. GROWTH is defined as the difference between total assets and lagged total assets divided by lagged total assets. NPT-NGC sample includes firms that had no preferential tax rate and are not controlled by government. NPT-GC sample includes firms that had no preferential tax rate and are controlled by government. \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level

**Table 5: Regression analysis**

	ETR <sub>2</sub>				ETR <sub>3</sub>			
	PT-NGC sample		PT-GC sample		PT-NGC sample		PT-GC sample	
	Estimate	t value	Estimate	t value	Estimate	t value	Estimate	t value
Intercept	-0.0009	-0.01	0.0028	0.06	-0.0232	-0.31	-0.0151	-0.30
RATE	0.1858	3.86***	0.1741	3.90***	0.2728	2.84***	0.4177	4.00***
SIZE	0.0003	0.08	0.0001	0.05	0.0007	0.20	-0.0011	-0.51
LEV	-0.0024	-1.81*	-0.0358	-5.77***	-0.0021	-1.53	-0.0391	-5.85***
ROA	0.0139	0.72	0.0761	1.82*	0.0085	0.43	0.0669	1.54
CAPINT	0.1100	6.28***	0.0828	7.33***	0.1059	5.57***	0.0776	6.60***
INVINT	0.1782	6.23***	0.1345	7.24***	0.1852	5.89***	0.1461	7.62***
GROWTH	0.0121	1.62	0.0042	0.67	0.0104	1.29	0.0063	0.95
Year effect	controlled		controlled		controlled		controlled	
Industry effect	controlled		controlled		controlled		controlled	
F value	5.95***		10.66***		4.89***		9.56***	
Adj R-sq	0.179		0.117		0.166		0.113	
No. of Obs.	748		2400		647		2214	

ETR<sub>2</sub> is defined as tax expense/profit before interest and tax. ETR<sub>3</sub> is defined as tax expense/(pre-tax profit - (deferred tax expense/statutory tax rate)). ETR<sub>4</sub> is defined as (tax expense - deferred tax expense)/(pre-tax profit - (changes in deferred tax/statutory tax rate)). Size is measured by the natural logarithm of total assets. LEV is defined as total liabilities divided by total assets. ROA is defined as profit before tax divided by total assets. CAPINT is defined as net fixed assets divided by total assets. INVINT is defined as net inventory divided by total assets. GROWTH is defined as the difference between total assets and lagged total assets divided by lagged total assets. PT-NGC sample includes firms that had preferential tax rate and are not controlled by government. PT-GC sample includes firms that had preferential tax rate and are controlled by government. \*\*\*: significant at the 1% level; \*\*: significant at the 5% level; \*: significant at the 10% level