



# Income tax liability for large corporations in China: 1998-2007

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## Abstract

**Purpose** – The purpose of this paper is to examine long-term income tax liability for Chinese public corporations from 1998 to 2007. It also studies the factors that are associated with Chinese firms' long-run effective tax rates.

**Design/methodology/approach** – The paper uses the measurement of long-run effective tax rate, developed by Dyreng *et al.*, which is measured as the sum of taxes paid over ten years divided by the sum of pretax book income over those same ten years. This paper is an empirical study using the financial report data collected from China stock market financial statement database and corporate ownership structure change from SINA Finance database. The tests include both univariate and multivariate tests.

**Findings** – The paper's findings are: ten-year effective tax rates are considerably lower than the statutory tax rate; ten-year effective tax rates vary significantly across industries and geographic areas; profitability, firm size, capital structure, and capital intensity are all associated with ten-year effective tax rates; corporate ownership structures, i.e. tradable vs non-tradable shares, are related to ten-year effective tax rates.

**Research limitations/implications** – Given that corporate ownership has changed dramatically in China in recent years, future studies should be conducted to explore the association between effective tax rates and ownership changes.

**Practical implications** – The paper is of interest to the policy makers, corporate managements, and academics, who seek to examine corporate income tax burden and the factors associated with tax rates over the long term. Given that corporate ownership has changed dramatically in China in recent year, future studies should be conducted to explore the association between effective tax rates and ownership changes.

**Originality/value** – The paper differs from Dyreng *et al.*'s paper in 2007. While Dyreng *et al.* conduct a univariate analysis on the association between firm characteristics and long-run effective tax rates, this paper employs multivariate regression models to examine what factors are associated with long-run effective tax rates. Second, this paper examines the relationship between corporate ownerships and effective tax rates.

**Keywords** China, Income tax, Large enterprises, Capital structure

**Paper type** Research paper

## 1. Introduction

On March 16, 2007, the Chinese Tenth National People's Congress passed the new Corporate Income Tax Law. The new law, which took effect on January 1, 2008, provides a unified income tax regime for both domestic and foreign investment enterprises. Under the new law, the standard corporate income tax rate is reduced from 33 to 25 percent; a further reduced rate of 20 percent applies to the small-scale and thin-profit enterprises

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and a preferential rate of 15 percent is available to the high and new technology enterprises, in order to equalize tax rates for all enterprises and reduce tax burden for domestic enterprises. Given this objective of reducing tax burdens for domestic enterprises, it might be fruitful to assess the enterprises' actual tax rates and tax burdens. Nevertheless, the actual, or effective, rate of tax paid by a corporation may differ from the statutory tax rate. There are several reasons for this:

- tax policies generally specify tax reductions and credits for certain business activities or transactions;
- firms may reduce the tax payable by employing effective tax planning strategies; and
- firms may avoid or evade taxes.

There is a large amount of economics, finance, and accounting literature which has analysed firms' actual/affective/marginal tax rates (Feldstein and Summers, 1979; Fullerton, 1984, 1986; Stickney and McGee, 1982; Gupta and Newberry, 1997; Lammersen, 2002; Plesko, 2003; Gordon *et al.*, 2002; Lim and Hyun, 2006; Dyreng *et al.*, 2007; among others). However, the existing literature generally examines corporations in Organization for Economic Co-operation and Development countries and rarely examines those in developing countries such as China. Bahl and Bird (2008) argue that tax policy and tax administration in developing countries are different from those in industrialized countries. As a result, the level of taxation (e.g. the ratio of tax revenue to gross domestic product) and the structure of taxation (e.g. the portion that each tax, including income tax, indirect tax, and international trade tax, bears to total taxes) are different from those in industrialized countries. This is true for China, where corporate income tax law as well as tax enforcement and administrative systems are quite different from those in industrial countries; for example, China provides favorable tax rate reductions for enterprises for certain types of industries (such as high-tech) and also for enterprises located in special economic zones or in the western areas of China. With respect to tax enforcement, the World Bank determined which tax systems were easy to obey and which ones made compliance difficult, and ranked China among the ten worst (Mitchell, 2007).

With respect to tax evasion in China, (*The Economist* (1989) points out that in 1989, the tax authorities of Shanghai seized the books of 10,361 private businessmen and found that 8,953 of them had evaded tax. As high as 86 percent of the 163,000 registered businessmen in Shanghai (3.2 percent of the city's workforce) may have evaded taxes, probably 100 percent of the unregistered ones did. According to Wan (2009) and Li (1995), tax evasion in China is estimated to have made the government a loss of around 100 billion Yuan a year.

In addition, the paper seeks to explore the relationship between corporate ownership structures and effective tax rates. There are two features for China stock markets and listed firms that do not exist in the West:

- (1) listed firms are mainly controlled by the state before the 2005 equity division reform; and
- (2) state-owned shares and legal person-owned shares are not tradable before the reform.

This study seeks to examine the association between listed firms' tradable/non-tradable shares and effective tax rates.

This study is motivated in part, by the dearth of research investigating tax reporting practices of Chinese listed firms. It is also motivated by the dearth of study on the role of ownership structures on firms' tax reporting practices. Shackelford and Shevlin (2001) point out that managers/insider control and other organizational factors, such as corporate governance or share ownership are important but understudied in tax research. Very little is known about the impact of ownership structure on effective tax rates (Adhikari *et al.*, 2006).

This study is also motivated by the growing importance of China's role in the world economy. Since China provides a very unique setting with high levels of state ownership in the capital market, it is important to gain more insight into what determine firms' effective tax rates there, and to investigate the tax reporting behavior of firms with high levels of state ownership. In addition, given the increase of government involvement in public companies due to the current economic downturn (especially in the USA), this becomes an interesting question for a wide range of policy makers, economists, and academics.

In this study, we use a ten-years effective tax rate to examine long-term income tax liability for Chinese public corporations. The ten-years effective tax rate, based on Dyreng *et al.* (2007), is measured as the sum of taxes paid over ten years divided by the sum of pretax book income over those same ten years. Current studies on effective tax rates in China use annual effective tax rate (Cao and Dou, 2007, Wu *et al.*, 2008a, b). For example, Cao and Dou (2007) examine the determinants of effective tax rates for Chinese listed firms. Wu *et al.* (2008) find that the effect of firm size on effective tax rate depends on the nature of the controlling shareholder. Wu *et al.* (2008) examine the relation between a private firm's chief executive officer's government connection and effective tax rate.

However, annual effective tax rate, defined as annual tax expenses divided by annual pre-tax income, varies year after year, and therefore, may not be a good measure of tax liability in each year when firms overpay taxes in one year and receive refund in the other year. Annual effective tax rate may also be meaningless when firms incur losses and the denominator is negative.

In this study, we use the financial report data collected from China stock market financial statement database and corporate ownership structure change from SINA Finance database and find that:

- In the sample of 554 firms, ten-year effective tax rates are considerably lower than the statutory tax rate. In fact, the mean (median) of the ten-year effective tax rates is 24.5 percent (21.3 percent); more than eighty percent of the sample firms have the effective tax rates lower than the statutory rate of 33 percent. In particular, more than a quarter of the sample firms have the effective tax rates lower than 15 percent.
- An examination of 17 industries' ten-year effective tax rates finds that farming, fishing and forestry, and information technology industries pay significantly lower tax rates; an examination of ten-year effective tax rates by geographic areas finds that firms with low tax rates are clustered in western China; these findings are consistent with the Chinese Government's general tax policies to protect certain industries and promote businesses in certain areas.
- An examination of firms' characteristics shows that profitability, firm size, capital structure, and capital intensity are all associated with ten-year effective tax rates,

which is also supported by the testing results from the multivariate regression models.

- Corporate ownership structures are related to ten-year effective tax rates. We find that firms with more than 50 percent non-tradable shares have significantly lower effective tax rates.

This paper is organized as follows. In Section 2, we briefly introduce corporate income tax in China. In Section 3, we calculate long-run effective tax rates for public corporations in China for the time period of 1998-2007 and present the testing results. Finally, we provide a conclusion and summary in Section 4.

## 2. Overview of corporate income tax in China

China's corporate income tax laws have developed gradually since the economic reform in 1978. Prior to 1994, domestic enterprises including state-owned enterprises, collective enterprises, and private enterprises followed different sets of tax laws. The 1994 *Enterprise Income Tax Law* replaced three earlier laws on taxation of domestic state-owned, collective, and private enterprises. According to the 1994 tax law, all domestic enterprises and joint-stock enterprises complied with a unified income tax system with a tax rate of 33 percent (30 percent of federal and 3 percent of local rates).

Foreign invested companies and foreign companies followed a different law. The 1991 foreign enterprise tax law replaced the earlier similar laws in 1980s. According to the 1991 tax law, foreign invested companies and foreign companies were taxed at a rate of 33 percent[1]. Still, different tax rules applied to foreign invested corporations/foreign corporations and domestic corporations ("dual track tax laws").

Under the 1994 domestic enterprise tax law and the 1991 foreign enterprise law, an enterprise's tax base is its world-wide income from production and business operations and from other sources. Its taxable income is equal to the total income earned by the enterprise in the taxation year, less allowable deductions; tax payable is computed on the basis of the taxable income multiplied by a rate of 33 percent. Two lower rates of 18 or 27 percent are applicable to certain small and less profitable enterprises.

Chinese income tax laws also provide tax exemptions and credits, which on approval by local governments, could be granted to a taxable firm. The major exemptions and reductions are:

- Preferential tax treatment and incentives for enterprises that operate in autonomous regions for a specified period.
- Tax exemptions or reductions for enterprises or businesses that meet the relevant rules of the state, such as high-technology enterprises and enterprises engaged in tertiary industry, enterprises using wastes as key raw materials, newly registered enterprises located in the revolutionary base areas, minority nationality areas, remote areas and poor areas, enterprises-suffering from serious natural disasters, newly registered service enterprises providing social employment opportunities, factories and farms run by schools under educational administration departments, welfare production enterprises belonging to civil administration departments, township enterprises, and state-owned agricultural enterprises, etc.

Table I shows the structure of federal taxation from 1978 to 2007.

Year	Total	Value-added tax	Sales tax	Consumption tax	Tariff	Agricultural levy	Corporate income tax
1978	519.28				28.76	28.40	
1980	571.70				33.53	27.67	
1985	2,040.79	147.70	211.07		205.21	42.05	696.06
1990	2,821.86	400.00	515.75		159.01	87.86	716.00
1991	2,990.17	406.36	564.00		187.28	90.65	731.13
1992	3,296.91	705.93	658.67		212.75	119.17	720.78
1993	4,255.30	1,081.48	966.09		256.47	125.74	678.60
1994	5,126.88	2,308.34	670.02	487.40	272.68	231.49	708.49
1995	6,038.04	2,602.33	865.56	541.48	291.83	278.09	878.44
1996	6,909.82	2,962.81	1,052.57	620.23	301.84	369.46	968.48
1997	8,234.04	3,283.92	1,324.27	678.70	319.49	397.48	963.18
1998	9,262.80	3,628.46	1,575.08	814.93	313.04	398.80	925.54
1999	10,682.58	3,881.87	1,668.56	820.66	562.23	423.50	811.41
2000	12,581.51	4,553.17	1,868.78	858.29	750.48	465.31	999.63
2001	15,301.38	5,357.13	2,064.09	929.99	840.52	481.70	2,630.87
2002	17,636.45	6,178.39	2,450.33	1,046.32	704.27	717.85	3,082.79
2003	20,017.31	7,236.54	2,844.45	1,182.26	923.13	871.77	2,919.51
2004	24,165.68	9,017.94	3,581.97	1,501.90	1,043.77	902.19	3,957.33
2005	28,778.54	10,792.11	4,232.46	1,633.81	1,066.17	936.40	5,343.92
2006	34,804.35	12,784.81	5,128.71	1,885.69	1,141.78	1,084.04	7,039.60
2007	45,621.97	15,470.23	6,582.17	2,206.83	1,432.57	1,439.09	8,779.25

**Table I.**

Structure of federal taxes in China: 1978-2007

**Note:** Billion Yuans**Source:** Statistics from China National Statistics Bureau (2009)

Dual-track tax laws, once necessary to attract foreign investment, are now perceived to negatively affect domestic corporations. Therefore, a reform of the tax system is deemed necessary by the central government to encourage future development of domestic enterprises. On March 16, 2007, the Chinese Tenth National People's Congress passed the new Corporate Income Tax Law. The new law provides a unified income tax regime for both domestic and foreign investment enterprises. Under the new law, the standard income tax rate is reduced from 33 to 25 percent. A further reduced rate of 20 percent applies to the small-scale and thin-profit enterprises and a preferential rate of 15 percent is available to the high and new technology enterprises. The new law is enacted on January 1, 2008.

This study examines the long-run tax liability for China's public corporations from 1998 to 2007, when the 1994 *Enterprise Income Tax Law* took effect. In the next section, we calculate ten-year effective tax rate, which has been developed by Dyreng *et al.* (2007). However, this study differs from Dyreng *et al.* (2007). While Dyreng *et al.* (2007) conduct a univariate analysis on the association between firm characteristics and long-run effective tax rates, this study employs multivariate regression models to examine what factors are associated with long-run effective tax rates. Second, this study examines the relationship between corporate ownerships and effective tax rates.

### 3. Ten-year effective tax rates and testing results

#### 3.1. Ten-year effective tax rate

To study firms' long-run tax liability, we use a ten-years effective tax rate, which (based on Dyreng *et al.* (2007)) is measured as the sum of taxes paid over ten years divided by

the sum of pretax book income over those same ten years. Annual effective tax rate, defined as annual tax expenses divided by annual pre-tax income, varies year after year, and therefore, may not be a good measure of tax liability in each year when firms overpay taxes in one year and receive refund in the other year. Annual effective tax rate may also be meaningless when firms incur losses and the denominator is negative. Dyreng *et al.* (2007) examine the relationship between annual effective tax rates and ten-year rates and find that annual effective tax rates are not very good predictors of long-run rates and are not accurate proxies for long-run rates.

The ten-year effective tax rate is calculated as:

$$\text{long-run effective tax rate} = \frac{\sum_{t=1}^{10} \text{tax paid}_t}{\sum_{t=1}^{10} \text{pre-tax income}_t}$$

The denominator is the pre-tax income shown on the firm's income statement instead of the taxable income calculated based on tax law. Taxable income is the taxpayer's tax base, on which the income tax is taxed. Ideally, the measurement is calculated based on taxable income. However, taxable income is confidential and we, as all other related studies, use accounting income. It should be noted that taxable income differs from accounting income because they follow different rules.

The numerator includes current tax expenses but not future (deferred) tax expenses. Future (deferred) tax expenses represent taxes to be paid in the future when book-tax differences are reversed. When measured over long periods of time, these expenses are more likely to be included.

### 3.2 Data collection and preliminary results

The data are collected from China Stock Market Financial Statement Database. The database covers all corporations listed on the Shanghai Stock Exchange or Shenzhen Stock Exchange for their financial statements since 1990. The firms selected for this study meet the condition that financial statements are available for consecutive ten years from 1998 to 2007[2]. There are 776 firms. Furthermore, we delete 194 firms whose sum of ten-year net income is negative. Related studies (Dyreng *et al.*, 2007) also delete firms with effective tax rate greater than 1. In our sample, 27 firms have an effective tax rate higher than 1, and so they are deleted from this study. As a result, we end up with a sample size of 554 firms. Panel A of Table II reports the sample selection.

Panel B of Table II presents the descriptive statistics of the ten-year effective tax rate for the 554 firms from 1998 to 2007. It shows that there are a considerable number of firms paying taxes at rates less than the statutory tax rate of 33 percent, even the value at the third quartile is 30 percent. In fact, it appears that more than 80 percent of the sample firms have ten-year effective tax rates lower than the statutory rate. Panel B also shows that the value at the first quartile is only 14.88 percent, lower than half of the statutory rate. In other words, more than 25 percent of the sample firms have effective tax rates lower than 15 percent.

### 3.3 High-tax and low-tax firms

We also classify firms with ten-year effective tax rate lower than 15 percent as "low-tax firms" and classify firms with ten-year effective tax rate higher than 40 percent as "high-tax firms". There are 142 firms categorized as low-tax firms and 58 firms categorized as high-tax firms.

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18,3

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*Panel A. Sample selection*

Firms with complete financial statements for 1998-2007	775
Less: Firms with sum of ten-year earnings < 0	(194)
Less: Firms' effective tax rates outside [0,1]	(27)
<i>Firms examined in this study</i>	554

*Panel B. Descriptive statistics of ten-year effective tax rates*

	Mean	SD	First quartile	Median	Third quartile	Minimum	Maximum
	24.5%	14.5%	14.88%	21.34%	30.62%	0.38%	96.5%

**Table II.** Sample selection and descriptive statistics of ten-year effective tax rate

**Notes:** The data are collected from China stock market financial statement database; the database covers all corporations listed on the Shanghai stock exchange or Shenzhen stock exchange for their financial statements since 1990; the firms in this study meet the condition that financial statements are available for consecutive ten years from 1998 to 2007

*3.4. The effect of industry*

To examine whether firms' long-run effective tax rates are associated with particular industries, we calculate average ten-year effective tax rates by industry, set out in Table III. There are 17 industries according to the industry classification provided by China Securities Regulatory Commission (CSRC). Firms which do not fit into these 17 industries – generally holding firms with major businesses and operations in more than one industry – are put into other categories. Table III shows that there are large variations in ten-year effective tax rates among industries; ranging from 13.33 percent in farming, fishing and forestry industry to 41.8 percent in finance and insurance industry. Table III also shows that for all the 17 industries, except the finance and

Industry	No. of firms	Tax rate (%)	No. of low tax	No. of high tax
Farming, fishing, forestry, etc.	9	13.3	7	0
Mining	7	29.1	2	1
Manufacturing	183	22.72	59	20
Utilities	35	22.9	10	3
Construction	8	29.3	0	2
Transportation and warehouse	19	18.1	7	0
Information technology	30	18.3	11	1
Real estate	32	29.9	3	4
Wholesale and retail	51	29.8	3	5
Social service	21	24.3	6	2
Finance and insurance	5	41.8	0	1
Communication and cultural media	4	21	1	0
Steel and iron	15	20.87	3	0
Auto and parts	10	20.87	4	1
Textile and clothing	9	27.67	2	2
Chemical	39	23.66	8	3
Pharmaceuticals	29	26.21	4	3
Other	47	29.14	12	10
Total	554	24.5	142	58

**Table III.** Ten-year effective tax rates by industry

insurance industry, effective tax rates are lower than the statutory tax rate of 33 percent. Other low tax industries include information technology (tax rate of 18.3 percent), transportation and warehouse (tax rate of 18.1 percent). The second and third highest tax industries are real estate (tax rate of 29.9 percent) and wholesale and retail (tax rate of 29.8 percent).

Table III also reports high-tax firms and low-tax firms from each industry. It shows that low-tax firms come from a wide variety of industries, except construction, and finance and insurance industries. On the other hand, high-tax firms come from 13 industries, except farming, fishing and forestry, steel and iron, transportation and warehouse, and communication and cultural media industries. In short, there are some clusters of high-tax and low-tax firms in certain industries. We then regress ten-year effective tax rate on explanatory variables including industry dummy variables.

### 3.5. Geographical location

To examine whether firms' long-run effective tax rates are associated with geographic location, we also calculate average ten-year effective tax rates by areas. Table IV displays

Areas	No. of firms	Ten-year tax rate (%)	No. of low-tax firms	No. of high-tax firms
Shanghai	87	21.4	26	6
Guangdong	72	21.2	27	5
Jiangsu	32	28.8	4	3
Zhejiang	31	24.5	6	2
Sichuan	29	26.8	5	6
Liaoning	27	28.3	3	2
Shandong	27	26.9	4	3
Beijing	25	22.3	5	2
Hubei	25	25.3	5	4
Fujian	20	26.4	7	3
Jilin	15	28	3	3
Anhui	14	24.8	3	1
Hebei	13	32.3	0	2
Chongqing	12	21	5	1
Shanxi	11	29.4	2	1
Shaanxi	11	25.8	3	1
Henan	11	25	1	0
Tianjin	10	37.6	0	3
Heilongjiang	10	22.3	2	1
Inner-mogolia	10	21.8	6	2
Yunnan	8	14.9	5	0
Guangxi	7	32.3	1	1
Hainan	7	20	5	1
Jiangxi	7	22.4	3	1
Hunan	6	25.9	0	1
Gansu	6	21	2	0
Guizhou	5	34.7	2	2
Xinjiang	5	17.8	2	0
Ningxia	5	17.2	2	1
Qinghai	3	14.8	1	0
Tibet	3	17.2	2	0
Total	554	24.5	142	58

**Table IV.**  
Ten-year effective  
tax rates by areas



average ten-year effective tax rates by the following geographic areas, four municipalities directly under the Central Government (Beijing, Shanghai, Tianjin, and Chongqing), five autonomous regions (inner-Mongolia, Ningxia, Guangxi, Xinjiang, and Tibet), and 22 provinces. Table IV shows that there are large variations in ten-year effective tax rates among geographic areas, ranging from 14.8 percent in Qinghai Province, to 37.6 percent in Tianjin municipality. Other low-tax areas are Yunnan Province (14.9 percent), Tibet and the Ningxia autonomous regions (17.2 percent). While other high-tax areas include Guizhou Province (34.7 percent) and the Guangxi autonomous region (32.3 percent).

Table IV also shows high-tax firms and low-tax firms from each area and reveals that low-tax firms come from various areas, except Tianjin municipality and Hunan Province. On the other hand, no high-tax firms come from the provinces of Henan, Yunnan, Gansu, Qinghai or the autonomous regions of Xinjiang and Tibet. In short, there are some clusters of low-tax firms in autonomous areas such as Xinjiang and Tibet, and in western areas which are remote, poor, or with a minority nationality.

### 3.6. The effect of corporate characteristics

Several studies have examined the relationship between firm size and effective tax rate. Zimmerman (1983) finds that effective tax rate is positively related to firm size, which is consistent with the political cost argument. However, Porcano (1986) and Dyreng *et al.* (2007) find a negative relationship; and Kim and Limpaphayom (1998) observe that large firms pay taxes at significantly lower effective rates in East Asian countries. Gupta and Newberry (1997) find that firm size has no effects on effective tax rate over time.

Table V examines the ten largest and smallest firms in our sample. It shows that the mean of ten-year effective tax rate is only 20.8 percent for the largest firms. Among the ten largest firms, five firms are low-tax firms and only one firm is a high-tax firm. On the other hand, the mean of ten-year effective tax rate is 36.9 percent for the smallest firms. Among the ten smallest firms, only three firms are low-tax firms, but four firms are high-tax firms. In summary, the analysis shows that large firms tend to pay lower taxes. Next, we add other firm characteristics.

We choose three other corporate characteristics to study, following Dyreng *et al.* (2007) and other studies; leverage, profitability, and capital intensity (the portion of fixed assets over total assets[3]). We first separate our sample firms into three categories: low-tax firms, high-tax firms, and other firms in the middle; resulting in

Variables	Mean low (142 firms)	Mean mid (354 firms)	Mean high (58 firms)	Difference between high and low groups
Ten-year tax rates (%)	10.76	24.53	56.29	45.53*
Size	9.34	9.04	9.19	-0.15*
Profitability	0.057	0.05	0.019	-0.038*
Leverage	0.45	0.48	0.55	0.10*
Fixed assets	0.31	0.31	0.26	-0.05*

**Table V.**

Mean differences between high-, middle-, and low-tax groups

**Notes:** Significance at: \*0.01 level; size: measured as log of total assets; profitability: measured as pre-tax income divided by total operating revenue; leverage: measured as liability divided by total assets; fixed assets: measured as net fixed assets divided by total assets

142 low-tax firms, 58 high-tax firms, and 354 firms in between. We compare the mean of firms' characteristics between high-tax and low-tax firms.

Table VI presents the mean difference. It shows that the mean of ten-year effective tax rates are significantly different between low-tax and high-tax firms.

Table VI also shows that the means of all four firms' characteristics are significantly different between low-tax and high-tax firms. Low (high)-tax firms tend to be larger (smaller), more (less) profitable (higher (lower) return on sale), higher (lower) portion of fixed assets, and lower (higher) leverage ratio. The finding that low-tax firms are large firms is opposite to Zimmerman (1983), which implies that large firms pay low taxes through economies of scale to tax savings and do not suffer political costs. The higher capital intensity for low-tax firms is consistent with the idea that spending on fixed assets likely saves taxes through accelerated depreciation deduction. Consistent with the findings in Adhikari *et al.* (2006) and Dyreng *et al.* (2007), low-tax firms are more profitable. Finally, Table VI shows that low-tax firms have lower leverage than high-tax firms. Given that interest expenses are tax deductible, whereas dividend payments are not, firms with higher leverage would reduce effective tax rates. Alternatively, Gupta and Newberry (1997) argue that a positive relationship between effective tax rates and leverage could be possible if firms taxed at high rates are more likely to use debt financing. They accept that it is difficult to draw unambiguous inference about the impact of firms' capital structure on their effective tax rates. In fact, our finding is consistent with the alternate argument.

Nevertheless, this analysis is merely a univariate comparison. Next, we design the multivariate regressions.

To determine what firms' characteristics are associated with their ten-year effective tax rates, we design the following regression models. First, we regress ten-year effective tax rates on firm size, leverage, profitability, and fixed assets:

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 PRO_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \varepsilon_i \quad (1)$$

where:

$TAX_i$  : Ten-year effective tax rate for firm  $i$ .

$SIZE_i$  : Firm size, measured as log of total assets for firm  $i$ .

$PRO_i$  : Return on sales, measured as pre-tax income divided by operating revenue, for firm  $i$ .

$LEV_i$  : Leverage, measured as total liability divided by total assets for firm  $i$ .

$FIX_i$  : Fixed assets, measured as net fixed assets divided by total assets, for firm  $i$ .

Second, we control industry effect by adding industry dummy variables:

*Panel A: ten-year tax rate for the ten largest firms*

Mean	% of firms in low tax (<15%)	% of firms in high tax (>40%)
20.8%	50	10

*Panel B: ten-year tax rates for the ten smallest firms*

Mean	% of firms in low tax (<15%)	% of firms in high tax (>40%)
36.9%	30	40

**Note:** Ranked by log of total assets

**Table VI.**  
Ten-year tax rates  
for the largest  
and smallest firms

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 PRO_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \sum_{j=1}^{12} \beta_{ij} IDU_j + \varepsilon_i \quad (2)$$

*IDU*: Industry dummy.

Table VII reports the regression results. The second and third columns present the results without industry dummies; while the fourth and fifth columns present the results with industry dummies (only industries with significant effect are presented). It shows that firm size and profitability are significantly and negatively related to ten-year effective tax rate; leverage is significantly and positively related to the tax rate, which is consistent with the mean comparisons in Table VI. However, fixed assets are not significant in the multivariate regression. When we add industry dummies, it shows that the co-efficients of three industries (farming, fishing and forestry, manufacturing, and information technology) are negative and significant at 0.01 level. It is plausible since, according to Chinese enterprise income tax law, certain industries, including high-technology enterprises and state-owned agricultural enterprises, receive favorable

Variable	Co. eff.	t-test	Co. eff.	t-test	Co. eff.	t-test
Intercept	0.6314	4.2789**	0.7265	4.7429**	0.716	5.0067**
PRO	-0.089	-2.2485*	-0.2184	-4.6678**	-0.198	-4.526**
SIZE	-0.0498	-3.0449**	-0.0516	-3.0593**	-0.0506	-3.2034**
LEV	0.1905	4.3893**	0.1113	2.5097*	0.124	2.887*
FIX	-0.0213	-0.5552	-0.0014	-0.0287	-0.043	-1.146
OWN					-0.0263	-2.105*
Manufacturing			-0.0554	-2.3985*	-0.0409	-3.242**
Information technology			-0.1093	-3.4481**	-0.1043	-3.9517**
Finance and insurance			-0.1467	-2.959*	-0.1324	-2.9069*
Farming, fishing and forestry			0.2933	4.0628**	0.3016	4.3696**
R <sup>2</sup>	0.0695		0.1581		0.1466	
F-test	10.2498		4.7758		10.3853	

Regression models:

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 PRO_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \varepsilon_i \quad (1)$$

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 POA_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \sum_{j=1}^{12} \beta_{ij} IDU_j + \varepsilon_i \quad (2)$$

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 POA_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \alpha_5 OWN_i + \sum_{j=1}^{12} \beta_{ij} IDU_j + \varepsilon_i \quad (3)$$

**Notes:** Significance at: \*0.05 and \*\*0.01 level; *TAX<sub>i</sub>*, ten-year effective tax rate for firm *i*; *SIZE<sub>i</sub>*, firm size, measured as log of total assets for firm *i*; *PRO<sub>i</sub>*, return on sales, measured as pre-tax income divided by total operating revenue, for firm *i*; *LEV<sub>i</sub>*, leverage, measured as total liability divided by total assets for firm *i*; *FIX<sub>i</sub>*, fixed assets, measured as net fixed assets divided by total assets, for firm *i*; *IDU*, industry dummy; *OWN<sub>i</sub>*, dummy variable, one for firms with non-tradable shares > 50 percent, and 0 otherwise

**Table VII.**  
Regression results

tax exemptions or reductions. High-technology enterprises may belong to information technology industry and state-owned agricultural firms may belong to farming industry. Finance & insurance industry, on the other hand, is significantly and positively related to ten-year effective tax rate, which is consistent with the argument that, banks are heavily taxed in China (Li, 2006; Wei, 2008)[4].

### 3.7. *The effect of ownership structure*

Corporate ownership structures have undergone dramatic changes in China as the country moved from a central-planning economy to a market-oriented economy. In the early of 1990s, two stock markets were established in Shenzhen and Shanghai, with mainly state-owned companies initially being listed on the markets. At that time, the share-holding system defined shares by their relationship with the state, and only non-state-related shares could be traded. Shares owned by the state (state-owned shares), or by legal persons (domestic and foreign legal person shares) or by employees (employee shares) were not tradable.

Since 1999, listed companies underwent two substantial corporate governance reforms. The first change was aimed at reducing state ownership in listed companies. On September 22, 1999, the Central Committee of the Chinese Communist Party passed the decision on some significant issued about the reform and development of state-owned enterprises, which announced the intention of reducing state ownership by selling off some state-owned shares. By 2002, state-owned shares had been decreased due to the sales of these shares to the public. However, the total non-tradable shares, including state-owned shares, legal persons, and employee shares still represented two-third of total shares, leaving one-third of total shares, held by public investors, tradable on the stock market. This division of equity tradability is a unique nature in Chinese.

The second ownership structure change, which is call “equity division reform”, was aimed to convert non-tradable shares into tradable shares. On August 25, 2005, the Chinese Ministry of Commerce and People’s Bank of China announced the guideline on equity division reform of listed companies. And on September 4, 2005, the CSRC issued the notice on issuing measures for the administration of equity division reform of listed companies. As a result, by the end of 2007, over two-third of the companies in the test sample for this paper, had the majority of their shares tradable on the market. The paper seeks to explore the relationship between tradable/non-tradable shares and effective tax rates.

The association between ownership structure and effective tax rates has not been sufficiently explored in developing countries (Adhikari *et al.*, 2006). In addition, existing studies have divergent conclusions on the effect of ownership has on taxation. On the one hand, Adhikari *et al.* (2006) argue that in developing countries, firms can, by virtue of political connections, obtain favorable policies from the government. They find that firms with more state-owned shares pay low taxes since they are more likely to have political connections and hence receive more government supports including tax reductions and exemptions. On the other hand, it is argued that reputation consideration can push managements to pay more taxes (or avoid tax aggressiveness). Good reputation benefits managements to the extent that those with good reputation are more likely to have a promising political career (Cao and Dou, 2007).

In this study, we collect corporate ownership information from SINA finance database. SINA finance database covers accounting and economics data of listed Chinese firms including financial statements, financial analysis, ownership structure changes since firms were listed, top ten shareholders, etc. We classify our sample firms into four categories as set out in Table VIII:

- (1) firms with more than 50 percent non-tradable shares for all years from 1998 to 2007, that is, these firms have more than 50 percent shares owned by the state or legal persons (in fact, most of the shares are mainly owned by the state);
- (2) firms with more than 50 percent tradable shares for all years, that is, these firms are not controlled by the state;
- (3) firms with more than 50 percent tradable shares since the 1999 reducing state-owned share reform, but not before 1999; and
- (4) firms with more than 50 percent tradable shares since the 2005 equity division reform, but not before 2005.

Panel A of Table VIII shows that before 1999, only 33 firms (6 percent of all firms) have more than 50 percent tradable shares, i.e. they are not controlled by the state or legal persons. This is consistent with the fact that, before the 1999 reducing state-owned shares reform, most listed firms were controlled by the state. After the 1999 reform, however, an additional 111 firms are no longer controlled by the state (they have less than 50 percent of non-tradable shares). In total, 144 firms (30 percent of all firms) are not controlled by the state. This is consistent with the fact that, after the 1999 reform, there are two-third firms controlled by the state and one-third firms are not. After the 2005 equity division reform, another 233 firms have more tradable shares. However, 177 firms still have less than 50 percent tradable shares in 2007, the last year of our testing time period. These firms are either still controlled by the state, or have more restricted shares which are temporarily suspended from trading on the market[5].

Panel A of Table VIII also shows category one firms have more low-tax firms (43 percent of all low-tax firms). On the other hand, category two firms have more high-tax firms (10 percent of all high-tax firms). Panel B of Table VIII shows that the mean of effective tax rate for category one is significantly lower than that for category two firms. These results imply that ownership structure (tradable vs non-tradable

<i>Panel A</i>		<i>No. (%) of firms</i>	<i>No. (%) of low tax firms</i>	<i>No. (%) of high tax firms</i>
Non-tradable shares > 50%		177 (32)	61 (43)	16 (27.6)
Tradable shares < 50%		33 (6)	2 (1.4)	6 (10)
Non-tradable shares < 50% after 2005		233 (42)	54 (38)	21 (36)
Non-tradable shares < 50% after 1999		111 (20)	25 (17.6)	15 (26.4)
Total		554 (100)	142 (100)	58 (100)
<i>Panel B</i>		<i>Ten-year effective tax rate</i>	<i>Mean difference</i>	
Non-tradable shares > 50%		22.52%	6.7%	
Tradable shares > 50%		29.22%	$(t = 2.1587^*)$	

**Table VIII.**  
Four categories of firms based on ownership structure

**Notes:** Significant at: \*0.05 level; the values in parentheses are calculated in percentage

shares) has some effects on effective tax rate. Next, we add firm ownership structure in the regression model and conduct a multivariate analysis. We add a dummy variable, which is equal to one for firms in category one, and zero otherwise:

$$TAX_i = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 PRO_i + \alpha_3 LEV_i + \alpha_4 FIX_i + \alpha_5 OWN_i + \sum_{j=1}^{12} \beta_{ij} IDU_j + \varepsilon_i \quad (3)$$

where:

$OWN_i$ : equal to 1 for firms with non-tradable shares > 50 percent for all years, for firm  $i$ .

Columns six and seven in Table VII report the results. It is shown that the co-efficient of  $OWN_i$  is significant and negative, which implies that firms with more non-tradable shares pays low taxes. This is consistent with the argument that firms controlled by the state (or legal persons) are more likely to obtain favorable tax treatments by the government, perhaps because such firms are more likely to have close links to, and influence on, local government, which has the authority to grant most of the tax exemptions or reductions.

#### 4. Conclusion and summary

This paper examines the income tax liability for Chinese public corporations from 1998 to 2007. We employ the measurement of long-run effective tax rate (i.e. ten-year effective tax rate), developed by Dyreng *et al.* (2007) to measure corporate long-run tax liability. This paper also studies factors are associated with firms' long-run effective tax rates. Using the financial report data collected from China stock market financial statement database and corporate ownership structure change from SINA Finance database, the study has the following findings and implications.

First, for the sample of 554 firms, ten-year effective tax rates are considerably lower than the statutory tax rate. Meanwhile, a large fraction of firms (more than 80 percent) have a ten-years effective tax rates lower than the statutory rate. The low effective tax rates could be driven by government preferential tax policies or management actions of tax planning, tax avoidance, or tax evasion. In the examination of data related to these issues, there is some evidence of industry effects. We find that farming, fishing and forestry and information technology industries pay significantly lower effective tax rates, consistent with the government's tax policy to protect these industries. There is also some evidence of geographic location effects. We find that firms with low tax rates are clustered in western China, consistent with the government's tax policy to support poorer areas.

The low effective tax rate could also be related to ownership structure. This study reveals that firms with more than 50 percent non-tradable shares have much lower effective tax rates than firms with higher than 50 percent tradable shares in the mean difference analysis as well as in the multivariate regression. Adhikari *et al.* (2006) argue that in non-western developing countries such as in East Asia, the economic system is relationship-based rather than market-based; business and politics are closely connected. In relationship-based systems, firms, by virtue of their political connections,

obtain privileges such as favorable policies and government subsidies; these include special tax deductions and credits. Consistent with this argument, we find that firms with more state-owned shares pay low taxes since they are more likely to have political connections and are able to benefit from them.

In addition, we find that ten-year effective tax rate is related to corporate characteristics including profitability, firm size, capital structure, and capital intensity.

This study is of interest to the policy makers that are concerned with the long-run tax reporting practices of listed firms. They may ask why there is so much variation in long-run effective tax rates across firms. This study is also of interest to academics who seek to examine the factors associated with long-run effective tax rates. In addition, this study into the effect of state ownership on effective tax rates should be of interest to critics that argue that state-owned firms enjoy preferential tax treatments due to their close connection to the government.

Furthermore, there are many unanswered questions regarding firms' long-run tax reporting practices. For example, can the low effective tax rates be explained more by government preferential tax policies or by management tax-reduction behavior? Do firms with low effective tax rates suffer any tax consequences such as increase litigation for tax evasion or lose reputation if labeled as tax aggressive? We hope that these questions will be addressed in future research.

#### Notes

1. Foreign invested enterprises have been able to take advantage of an extensive range of incentives based on the industry sector or the geographical location of their business. For example, firms in the manufacturing sector can be exempt from paying any tax whatsoever for the first two years of operating and receive a 50 percent reduction in the standard tax rate for three years thereafter. In addition, there are a host of other tax benefits for foreign firms including a base rate of 15 percent for manufacturers in designated Economic and Technological Development Zones or for businesses in Special Economic Zones. Further tax rates of 24 percent are also available for productive foreign invested enterprises located in various development zones and cities, dependent on the location of the project.
2. There are no foreign invested companies or foreign companies in our sample because:
  - foreign companies are not allowed to be listed on Chinese stock exchange markets; and
  - it was not until after 2001, that foreign invested companies started to issue A and B shares to China domestic investors and were listed on Chinese stock markets under the China Foreign Trade Bureau and China Security Exchange Committee, who issued comments on public corporations involved in foreign investment on November 8, 2001. Hence this study does not consider the special tax treatments on foreign invested companies or foreign companies.
3. Dyreng *et al.* (2007) choose intangible assets instead of fixed assets. In this study, since intangible assets were not reported before 2007, we choose fixed assets. Fixed assets lead to depreciation deduction which reduces taxable income and hence tax expenses and, therefore, the portion of fixed assets over total assets is expected to be negatively associated with effective tax rate (Atkinson and Stiglitz, 1980; Stickney and McGee, 1982; Gupta and Newberry, 1997).
4. Li (2006) argues that, according to Chinese corporate income tax law, tax deductions for salary and bonus expenses and bad debts are very restrictive. Since banks usually spend

more salary and bonus expenses and incur more bad debts, and these expenses and losses cannot be fully deductible for tax purposes, they pay taxes at higher tax rates than others.

5. Under the equity division reform, the conversion of non-tradable shares into tradable shares is a gradual process. To avoid any negative effects on stock prices by selling off large number of tradable shares, non-tradable shares cannot be traded for one year after conversion (these shares are called restricted shares). Thereafter, only 5 percent of the shares could be traded in the second year after conversion and in the third year after conversion another 10 percent could be traded. This process carries on until all non-tradable shares are trading on the market.

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