

# Tax Collector or Tax Avoider? An Investigation of Intergovernmental Agency Conflicts

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**ABSTRACT:** Local governments play dual, but conflicting, roles in China's tax system. That is, they are both tax collectors and controlling shareholders of firms subject to tax payments. We investigate how local governments balance their tax collection and tax avoidance incentives. We find that the conflicts between central and local governments arising from the 2002 tax sharing reform have led to more tax avoidance by local government-controlled firms, particularly when the local government's ownership percentage of the firms is higher than the tax sharing ratio. We also find evidence that the overall level of tax avoidance by local government-controlled firms in a region is positively associated with local fiscal deficits. As a high level of government ownership of corporations and intergovernmental tax sharing are common phenomena in many transitional economies, this study offers valuable insights into how the dual roles played by local governments affect tax policy enforcement in these economies.

**Keywords:** intergovernmental agency conflicts; agency theory; tax sharing reform; tax avoidance; tax collection; tax policy enforcement.

**JEL Classifications:** H26; H71; M40; G38.

## I. INTRODUCTION

Previous research has documented that tax avoidance activities are associated with firm characteristics, ownership concentration, compensation contracts, and agency problems (see [Hanlon and Heitzman \[2010\]](#) for a review). However, little is known about the role governments play in tax avoidance by government-controlled firms. Taking advantage of the unique setting provided by a change in the tax revenue sharing ratio between the central and local governments in China, we investigate how local governments balance their tax collection and tax avoidance incentives and determine whether local governments expropriate the central government's tax revenue by directing the firms they control toward tax avoidance.<sup>1</sup>

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<sup>1</sup> In this study, we define tax avoidance as any activities that reduce explicit taxes per dollar of pre-tax accounting profit or cash flows by *managing tax reporting*. A local government is defined as a provincial or municipal government that reports directly to the central government (e.g., Beijing, Shanghai, and Shenzhen).

A distinct characteristic of China's capital markets is that the majority of listed firms are government-controlled, either directly through government bodies, such as state asset management agencies, or through institutions authorized to hold shares on behalf of the state, such as state-owned enterprises (SOEs) (China Securities Regulatory Commission [CSRC] 2007). Thus, local governments serve dual, but conflicting, roles as controlling shareholders of firms from which they also collect taxes. As tax collectors, local governments aim to increase local fiscal revenue by collecting more taxes. If the firms in a locality avoid taxes, then the local government's tax revenue is reduced. Hence, the local government has a strong incentive to discourage the firms it controls from engaging in tax avoidance.<sup>2</sup> However, as the controlling shareholder of those same firms, the local government is the largest beneficiary of a high after-tax return and, thus, has a great incentive to direct its firms toward tax avoidance to maximize the after-tax profit (and, thus, the resources) under its control. This incentive exists as long as the tax revenue collected from the local government-controlled firms does not completely belong to the local government. The change in the corporate income tax sharing ratio implemented in 2002 provides an ideal setting for us to investigate the effects of the intergovernmental agency conflicts related to the trade-off between local governments' tax collection and tax avoidance incentives.

In 1994, as part of a fundamental reform of fiscal resource allocation, China introduced a system in which tax revenue was shared between the central and local governments. Under this tax sharing system, the income taxes collected from local government-controlled firms (LG firms) are exclusively assigned to the local governments, whereas those collected from central government-controlled firms (CG firms) are assigned exclusively to the central government (State Administration of Taxation [SAT] 1995). Under this system, there is no intergovernmental agency conflict as local governments retain 100 percent of the taxes they collect. Thus, local governments, as the controlling shareholders of LG firms (they normally own less than 100 percent of the shares), can direct their firms to maximize tax payments and, thus, minimize the need to share profit with minority (outside) shareholders. We expect that under this system, local governments' tax collection incentive surpasses their tax avoidance incentive.

In 2002, to further enhance the central government's ability to allocate fiscal resources to national programs, such as infrastructure, defense, and social welfare projects, the central government amended the sharing system. The new system requires that the income taxes of LG firms be shared equally with the central government (SAT 2001). Thus, since 2002, local governments have acted as tax collection agents for the central government. Under this new system, the cash flow rights on tax receipts are separated from the decision rights on tax administration, and the ensuing intergovernmental agency conflict is the main theme of this study. Local governments must now make trade-offs between the cost of sharing taxes with the central government and the cost of sharing after-tax profits with minority shareholders.<sup>3</sup> When the local governments' ownership percentage in LG firms is higher than the tax sharing ratio, they will steer their LG firms to minimize tax payments through tax avoidance as the shared tax revenue will be less than the shared after-tax profit. In such circumstances, the intergovernmental agency cost is higher than the corporate agency cost.

Based on a sample of 5,201 firm-year observations of government-controlled listed firms from 1999 to 2006, we find evidence supporting the hypothesis that LG firms engage in more tax avoidance in the post-2002 period (after controlling for other variables expected to influence tax avoidance).<sup>4</sup> Our analysis indicates that this relationship is largely driven by LG firms in which the local government ownership percentage is higher than the tax sharing ratio. In an additional test, we find that the increased tax savings of tax-aggressive LG firms are associated with higher cash dividends after 2002. Moreover, the regional average level of tax avoidance for LG firms is positively associated with local fiscal deficits and the ratio of the local governments' profit distribution from LG firms to their shared tax revenue. Finally, our results suggest that CG firms also engage in tax avoidance when their tax revenue must be shared with the local governments.

Our study makes several contributions. First, we add to the tax literature by documenting how intergovernmental agency conflicts affect tax avoidance activities. Why government-controlled firms avoid taxes has long been a puzzle for many researchers. We provide direct evidence to help resolve this puzzle. Previous studies have focused on investigating the tax avoidance behavior of firms from the perspective of agency conflicts between controlling and minority shareholders (e.g., Lo, Wong, and Firth 2010; Shevlin, Tang, and Wilson 2012). We explore the effect of intergovernmental agency conflicts on these firms in the context of a tax sharing system. We are the first to investigate the effects of such conflicts on tax avoidance, and we

<sup>2</sup> The common mechanisms through which firms avoid taxes in China include shifting income to subsidiaries with a low tax rate by manipulating transfer prices, using different sales cutoff points for book and tax purposes, capitalizing repairs and betterment expenditures for book, but expensing them for tax, and overstating the costs and expenses of related-party transactions. There are endless examples of such actions resulting in a lower effective tax rate.

<sup>3</sup> Sharing of after-tax profits includes dividends paid to shareholders and shares of retained earnings. Dividend payments are determined by the board of directors and are pro rata to all shareholders (including government shareholders) according to their shareholding percentage. As the local governments control the board of directors, they can increase the level of distribution whenever they need to increase cash flow.

<sup>4</sup> Our measure of tax avoidance (METR) is the ratio of the effective tax rate (ETR) to the applicable tax rate (ATR). This measure reflects the extent to which a firm's actual tax burden deviates from its applicable tax rate. We discuss the advantages of this measure in Section IV, "Research Design."

find that due to intergovernmental agency conflicts, tax avoidance can be used by local governments (the agents) to divert the revenue of the central government (the principal).<sup>5</sup> Specifically, we provide evidence that when the share of tax collections that reverts back to the government is low enough, there are incentives for government-controlled firms to avoid tax. While [Jensen and Meckling's \(1976\)](#) agency theory normally explains conflicts of interests in firms, we demonstrate the general applicability of agency theory beyond the private business perspective.<sup>6</sup>

Second, we contribute to the public finance literature. Fiscal decentralization through tax revenue sharing among national and subnational governments is a global phenomenon ([Organisation for Economic Co-operation and Development \[OECD\] 1999](#)). Previous studies have investigated the efficiency of tax sharing systems from economics and public finance perspectives (e.g., [Bird and Chen 1998](#); [Bizioli and Sacchetto 2011](#)). Using micro accounting data from Chinese listed firms and macro fiscal data from Chinese governments, we provide evidence that intergovernmental agency conflicts created by tax sharing systems have affected not only governments' tax enforcement, but also the tax avoidance behavior of government-controlled firms.<sup>7</sup>

Finally, our findings have policy implications for transitional economies in which corporate ownership and political power are highly intertwined in the political-economic system, such as Russia, India, Vietnam, and some Central and Eastern European countries ([Bird and Vaillancourt 1999](#); [OECD 1998](#); [Shah 2006](#)). Despite the popularity of mass privatization programs during the last two decades, SOEs are still an important part of many countries' economies.<sup>8</sup> To a large extent, the local governments in these countries also share tax revenue collected from corporations (including SOEs) in their jurisdictions ([Bird 2012](#); [Ministry of Finance 2010](#); [Martinez-Vazquez and Nguyen 2011](#); [Peteri and Sevinc 2011](#)). Thus, intergovernmental agency conflicts are unavoidable in such political-economic environments. Our study sheds light on how the dual roles played by local governments, as administrators of public affairs and controlling shareholders of listed firms, affect tax policy enforcement under fiscal decentralization. Our findings should serve as a valuable guidance for public policy makers in many transitional economies. However, the generalizability of our results is subject to the differences in tax system design and administration in these countries.

## II. INSTITUTIONAL BACKGROUND

### China's Privatization and Tax Sharing System

To transform from an economy that is centrally planned to one that is market-oriented, China implemented a variety of reforms over the past three decades. Two key reforms are particularly relevant to this study. The first is the privatization of SOEs and the establishment of capital markets in the early 1990s. The central government restructured the SOEs and sold *partial* equity ownership of the SOEs to the public via initial public offerings (IPOs) ([Chan, Mo, and Tang 2016](#)). Accordingly, most Chinese listed firms are controlled by different layers of government.<sup>9</sup> According to previous studies (e.g., [Jian and Wong 2010](#); [Fan, Wong, and Zhang 2007](#)), more than 75 percent of listed firms in China are controlled by the central or local governments, and the government can exert substantial control over firms' operational activities and personnel.

The second relevant reform is the redistribution of fiscal powers between the central and local governments. A tax sharing system was introduced in 1994 as a fundamental reform of taxation policies and intergovernmental fiscal relations.<sup>10</sup> The main objective was to establish an efficient fiscal allocation mechanism that could enhance the central government's tax revenue collection and distribution power, and match the fiscal expenditure of local governments with their local fiscal revenue ([Zhang and Martinez-Vazquez 2003](#)). Under the 1994 tax sharing system, the corporate income taxes collected from LG firms,

<sup>5</sup> Using a small sample of B-share firms, [Shevlin et al. \(2012\)](#) find no significant difference in tax-induced income shifting among the consolidated group members of state-owned enterprises before and after the 2002 tax sharing reform. They focus their argument on the agency conflicts between government controlling shareholders and minority shareholders, without considering intergovernmental (central versus local) conflicts and local fiscal conditions.

<sup>6</sup> Similar to a corporation, the government may also be subject to various incentive problems between citizens and politicians or between politicians and administrative bureaus. Whether tax avoidance in this context is good for society depends on the self-interests of different stakeholders.

<sup>7</sup> Many government-controlled firms are not listed in OECD countries or in emerging economies, including China ([Christiansen 2011](#)). As listed firms have higher non-tax costs for tax avoidance than non-listed firms ([Mills and Newberry 2001](#)), we expect the effects of intergovernmental agency conflicts on non-listed government-controlled firms' tax avoidance behavior to be even more significant than those of listed government-controlled firms.

<sup>8</sup> There are still a large number of SOEs in Russia, India, Vietnam, Brazil, and Turkey, and the output of SOEs to gross domestic product (GDP) in these countries ranges from 13 to 34 percent ([Musacchio and Lazzarini 2012](#), Table 2).

<sup>9</sup> For historical reasons, central and local governments normally do not have significant cross-shareholdings in each other's controlled firms.

<sup>10</sup> The shared revenue between the central and local governments includes value-added tax, stamp duty on security transactions, personal income tax, resources tax, and corporate income tax. Our study focuses on corporate income tax because: (1) it is the second-largest tax in China, accounting for 13.8 percent of the central government's total tax revenue and 11.4 percent of local governments' tax revenue during our sample period (1999–2006); and (2) the contrast between the income tax sharing ratio and shareholding ratio offers us an ideal setting to study the trade-offs between tax collection and tax avoidance incentives.

collective enterprises, joint ventures, and individual enterprises were exclusively assigned to local governments, whereas income taxes collected from CG firms, national and foreign banks, and non-bank financial and insurance institutions were assigned exclusively to the central government (SAT 1995).

As explained above, in 2002, the central government changed the tax sharing system to increase the resources for national programs, including infrastructure projects, national defense, and the redistribution of wealth to poorer provinces (Zhang and Martinez-Vazquez 2003).<sup>11</sup> Since 2002, the income taxes collected by local governments from their LG firms must be shared with the central government, and taxes collected by the central government from the relatively small in size (although large in number) CG firms must also be shared with local governments. However, the large amount of income tax collected from monopoly CG firms (e.g., large banks, oil, natural gas, rail transportation, and defense companies) does not need to be shared with local governments.<sup>12</sup> In 2002, the sharing ratio between the central and local governments was 50:50, but since 2003 it has been 60:40.

### Reporting Relationships and Decision Rights of the Central Government, Local Governments, and Their Agents

China has a “regionally decentralized authoritarian” system inherited from its 2,000-year-old imperial history (Xu 2011; Radhakrishnan 2014).<sup>13</sup> The structure established by the imperial regime is the foundation of the institutional framework that guides China’s transition to a market-oriented economy. Today, many important economic decisions in China are decentralized and delegated to subnational governments. Local governments are responsible for initiating and coordinating economic activities and enforcing the laws in their jurisdictions. However, because senior local government officials are appointed, promoted, and rotated by the central government, regional officials have incentives to follow the central government’s policies. This institutional setup is different from U.S.-style federalism, in which state and municipal heads are elected by the citizens of their jurisdictions.

Figure 1 illustrates the reporting relationships and decision rights of the central government, local governments, and their agents for tax reporting and collection within the intergovernmental and corporate agency framework. The central government has the decision rights to set tax laws and policies (including the statutory tax rate).<sup>14</sup> However, it delegates the collection of income taxes from LG firms to local tax bureaus supervised by the local governments. Although they are monitored by the central government, the local governments’ actions related to income tax collection from LG firms cannot be completely observed because the central government focuses on monitoring the *total amount of corporate income taxes* from various ownership in a province, including LG firms, foreign investment enterprises, and private Chinese firms.

Local governments have an incentive to follow the tax codes and meet the central government’s tax collection expectations. Although officials in local tax bureaus are appointed and supervised by local governments, the local tax bureaus are also monitored on an as-needed basis by the central government’s State Administration of Taxation (SAT). Furthermore, the political careers of local government officials depend on their ability to meet the central government’s expectations in terms of tax collection and provincial economic performance.<sup>15</sup> The desire for political promotion may constrain their incentive to expropriate the central government’s tax revenue through tax avoidance (Edin 2003; Shih, Adolph, and Liu 2012). However, higher taxes reduce the after-tax profits of LG firms, which adversely affect the financial position of the local government (Fan, Chen, and Treisman 2009). A large local government deficit is very undesirable, as it casts doubts on the bureaucrats’ ability to govern and could damage their political careers (Zhou 2007; Fan et al. 2009).<sup>16</sup>

The central and local governments control their state-owned enterprises by appointing government officials or politically connected individuals as board chairmen or CEOs of the controlled firms (Chen, Li, Su, and Sun 2011). The boards of these firms are also typically dominated by connected officials (Fan et al. 2007). Managers in SOEs, whether they are government officials or hired managers, are responsible to all of the shareholders, including the government. The managers and those charged with governance of SOEs make tax reporting decisions and control the rights to use resources (including dividend distribution and retained earnings). Similar to those in non-SOEs, they are expected to maximize shareholders’ wealth. Given

<sup>11</sup> The tax sharing reform was not accompanied by any significant changes in the tax law (e.g., tax base or statutory tax rates).

<sup>12</sup> Among our sample firms, the average income tax expense for the non-sharing CG firms is about 1.6 percent of total assets, whereas the average is only 0.8 percent of total assets for those CG firms that need to share income tax revenue with local governments.

<sup>13</sup> Regionally decentralized authoritarian systems are characterized by a combination of political centralization and economic regional decentralization (Xu 2011).

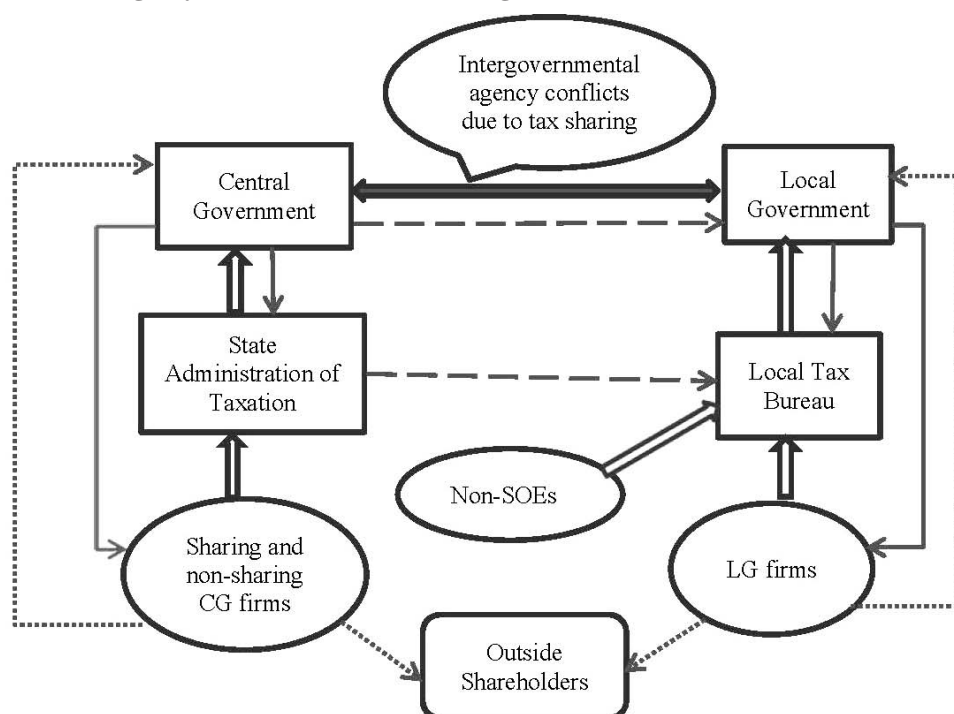
<sup>14</sup> Local governments can reduce firms’ tax burden using tax rebates, but there are limits to such tax rebates.

<sup>15</sup> Research has shown that regional leaders’ prospects for promotion increase with their economic performance, as measured by local GDP (Li and Zhou 2005).

<sup>16</sup> Anecdotal evidence also suggests that local governments have a variety of methods for meeting tax collection targets. When the total amount of taxes collected is below expectations, they can argue for an adjustment based on some uncontrollable economic factors. They can also cover the shortfall by requiring non-SOE firms to pay extra income taxes or by extending the breadth and depth of audits of non-SOE firms.



**FIGURE 1**  
**Intergovernmental Agency Conflicts and Decision Rights of Central and Local Governments and Their Agents**



$\longleftrightarrow$	Tax sharing between governments: CG receives 60% and LG receives 40% of corporate income tax payment from LG firms and sharing CG firms
$\Rightarrow$	Income tax payment
$\Rightarrow$	Supervisory role (CEOs/tax officials appointed by the governments)
$- \Rightarrow$	Monitoring role
$\cdots \Rightarrow$	Profit distribution
<b>Decision rights and monitoring</b>	
Central Government (CG)	The Ministry of Finance of CG sets tax laws and policies (including statutory tax rate) and appoints SAT officials; the central government is the controlling shareholder of CG firms and appoints CEOs or chairmen of the board of directors of CG firms.
Local Governments (LGs)	Local governments appoint officials of local tax bureaus, are controlling shareholders of LG firms and appoint CEOs or chairmen of the board of directors of LG firms
State Administration of Taxation (SAT)	SAT officials are appointed by the CG. They administer and enforce tax policies and tax laws for the CG, collect various taxes for the CG, provide guidance and coordination on taxation issues and monitor local tax bureaus on an as-needed basis.
Local tax bureaus	Local tax bureau officials are appointed by LGs, supervised by LGs and monitored by the SAT. They collect income taxes from LG firms and non-SOEs in their jurisdictions.
CG firms	Managers and those charged with governance have decision rights on tax reporting, profit distribution, investments and other corporate management matters.
LG firms	Managers and those charged with governance have decision rights on tax reporting, profit distribution, investments and other corporate management matters.

that their career advancement depends on their ability to meet the political and economic objectives of their government owners, they tend to maximize the total payoff (i.e., the share of tax revenue and after-tax profit) for the governments. In addition, an increased after-tax return on investment from LG firms is beneficial to the development of the local economy, and will increase LG firms' ability to attract external capital (Jiang, Lee, and Yue 2010). Finally, in contrast to private and foreign

firms, government-controlled firms are less frequently audited and are punished less harshly when they are caught due to their political connections (Shevlin et al. 2012; Chen et al. 2011). Thus, the cost of tax avoidance is low for LG firms.

### Local Governments' Fiscal Sources

Previous studies have shown that the fiscal imbalance between revenue allocation and actual expenditure in local governments is a major concern in most transitional economies (Bird and Vaillancourt 1999). According to Chen et al. (2011), the average local government expenditure in China was 1.375 times its total revenue during the 1993–2008 period.<sup>17</sup> Thus, local governments have strong incentives to increase revenue by any means, including tax avoidance, to cover their deficits.

Local governments' fiscal sources are composed of budgetary and extra-budgetary revenue. Budgetary revenue is basically the tax revenue assigned by the central government based on the tax collection and tax sharing ratio. Extra-budgetary revenue (i.e., non-tax revenue) mainly includes after-tax profits from LG firms, administrative charges, special government funds, levies and penalties, school fees, and local land sales. The major advantages of extra-budgetary revenue over budgetary revenue are as follows: (1) local governments do not need to share these funds with the central government; and (2) its use is not subject to the supervision of the central authorities, such as the National People's Congress (Zhan 2011). Given these advantages, local governments are keen to increase extra-budgetary revenue to cover their fiscal shortages (Lin 2001; Zhan 2011).

### III. HYPOTHESIS DEVELOPMENT

The literature suggests that corporate tax avoidance is a worthwhile activity if it can increase the payoff to firm owners (Chen and Chu 2005; Desai, Dyck, and Zingales 2007; Hanlon and Heitzman 2010). The payoff to a firm owner includes dividend payment and the pro rata share of undistributed after-tax profits retained for reinvestment and other purposes. Although listed firms in China are mainly owned by the governments, these firms are also partially owned by outside shareholders. If LG firms avoid tax, then local governments, as controlling shareholders of LG firms, can obtain an increased payoff from tax savings. However, as tax collectors, local governments incur tax revenue losses. Given that local governments need resources to cover their fiscal needs, they have incentives to make choices that will maximize their payoff.

We explain how local governments balance their tax collection and tax avoidance incentives to maximize their total payoff before and after 2002 in Appendix A. Mathematically, when a local government's tax sharing ratio is lower than its ownership percentage in LG firms, tax avoidance will be more beneficial to the local government. Specifically, our numerical examples in Appendix A show that in the pre-2002 period, as there is no intergovernmental agency conflict, local governments have a higher payoff if their LG firms pay taxes than if they avoid taxes. In fact, LGs can exploit minority shareholders by paying more taxes. However, in the post-2002 period, the change in the revenue distribution policy makes local governments better off if LG firms avoid taxes, particularly when the local government ownership is higher than the tax sharing ratio. By avoiding taxes, LG firms can retain more earnings under the LG's control and these reserves can be tapped into whenever needed by the local government. Furthermore, LG firms' tax avoidance also increases the minority shareholders' payoff. In other words, the tax sharing reform in 2002 can align the local governments' interests with those of minority shareholders.

Building on the above discussions, we formulate the following hypotheses:

**H1:** Local government-controlled (LG) firms engage in more tax avoidance in the post-2002 tax sharing reform period than before.

**H2:** The effect of the 2002 tax sharing reform on LG firms' tax avoidance is more pronounced when the local governments' shareholding percentage is equal to or higher than their income tax sharing ratio.

Agency problems are inevitable in any principal-agent relationship. When local governments' interests deviate from those of the central government, they have incentives to behave opportunistically in pursuit of their self-interests. H1 and H2 predict the reactions of LG firms to the change in the tax sharing ratio at the firm level. From a more macro view, in our third hypothesis, we investigate the effect of local fiscal conditions on the magnitude of LG firms' tax avoidance at the provincial level.<sup>18</sup>

As discussed, local governments are keen to increase extra-budgetary revenue to cover their fiscal shortages. To this end, local governments can increase their extra-budgetary revenue by imposing large administrative fees and surcharges. However, arbitrary exactions degrade the investment environment and hurt the regional economy in the long run, which may lead to central government intervention. In contrast, maximizing after-tax profits from LG firms through tax avoidance has important

<sup>17</sup> The tax bases of local governments are generally too narrow to sufficiently support their increasing expenditures (Lin 2001).

<sup>18</sup> Institutional variables (e.g., local fiscal data and GDP) are generally disclosed at the provincial level in China, which has 22 provinces, five autonomous regions, and four municipalities that report directly to the central government.

benefits. First, with a high after-tax return, LG firms can attract more investment through rights offering without diluting the LG's stake, or they can reinvest the retained earnings in profitable projects, which will benefit the local economy. Second, transferring revenue from budgetary accounts to extra-budgetary accounts by maximizing profit distribution and retained earnings via tax avoidance is a subtle choice, because tax planning, dividend payouts, and corporate investment are commonly considered business-driven activities and, thus, can hide the local government's real intentions.<sup>19</sup> Hence, in the post-2002 period, local governments are more eager to maximize their controlled firms' after-tax profits to increase their extra-budgetary revenue, which they can use to help cover their fiscal shortages. Specifically, we predict that local governments located in provinces with large fiscal deficits are keener to seek extra-budgetary revenue by maximizing the resources under their firms' control. Thus, they engage in a higher level of tax avoidance.

In addition, the fiscal composition in different regions may be associated with the average level of tax avoidance in that region. For example, provinces with a high level of profit distribution may be associated with a higher level of tax avoidance than other provinces. Finally, if a local government has a strong ability to impose administrative fees and surcharges on non-government-controlled businesses to overcome fiscal imbalances, then there should be a decreased need to misappropriate central tax revenue via tax avoidance. Hence, we predict the following:

- H3:** The regional magnitude of tax avoidance for LG firms is associated with local fiscal deficits, fiscal composition, and local governments' ability to expropriate assets through public exactions.

## IV. RESEARCH DESIGN

### Tax Avoidance Measures

In this study, we construct two modified effective tax rates to measure tax avoidance. We use the traditional ETR (Total Income Tax Expense/Pre-Tax Book Income) because the majority of A-share listed firms in China use the tax payable method to account for income tax in financial reporting.<sup>20</sup> This means that the income tax expense reported in the income statement is equal to the provision for tax payable in a particular period without recognizing deferred income tax. Thus, our first ETR (i.e., ETR1) measures the actual tax burden as a percentage of pre-tax accounting income in a period. However, accrual-based earnings management may affect pre-tax accounting income and, thus, the ETR (Hanlon and Heitzman 2010). To alleviate this concern, we use cash flow from operations as an alternative denominator. As a result, our second ETR (i.e., ETR2) is measured as total income tax expense divided by operating cash flows.

One limitation of the commonly used ETR measures is that they do not distinguish tax savings from tax preferences and aggressive tax reporting. For example, a firm with a tax holiday will have a low ETR even if it does not engage in tax avoidance. This concern affects our study because Chinese listed firms are subject to the varying applicable tax rates (ATRs) that arise from the numerous tax preferential policies for specific firms, regions, industries, etc. (Shevlin et al. 2012). To disentangle this effect, we modify our two ETR measures and construct *METR1* (i.e., ETR1 divided by ATR) and *METR2* (i.e., ETR2 divided by ATR). ATR is the statutory tax rate applicable to a listed firm after considering tax preferences (e.g., tax holidays and exemption) and tax rebates. In other words, ATR captures whether a firm enjoys favorable tax treatments and why a firm has a lower tax burden than the standard tax rate (i.e., 33 percent) from a policy perspective. ATR does not reflect any aggressive tax reporting undertaken by a firm. By using ATR to modify ETRs, we control for the differential applicable tax rate effect on ETR, which allows us to capture the tax avoidance achieved by managing tax reporting.<sup>21</sup> Following Gupta and Newberry (1997), we truncate ETR1 and ETR2 to [0,1] before estimating *METR1* and *METR2*. A low *METR1* or *METR2* implies a high level of tax avoidance.

<sup>19</sup> In some cases, the central government may turn a blind eye to LGs' tax avoidance because the central government realizes the problem of fiscal imbalance in local governments. Prohibiting extra-budgetary practices aggravates the local fiscal deficit and threatens the functioning of local governments, thereby affecting social stability. Zhan (2011) finds that the central government prioritizes social stability when deciding on intervention tactics.

<sup>20</sup> According to China's generally accepted accounting principles, listed firms can use either the tax payable method or the tax effect method to account for their tax payment until 2008. In our sample, about 90 percent of firm-years use the tax payable method. In a robustness test, we use the current effective tax rate, defined as (Income tax expense + Deferred tax)/Pre-tax book income, as an alternative measure. For firms without reported deferred tax assets or liabilities, we set it as zero. The results are qualitatively similar to those presented in Table 3. It should also be noted that few Chinese listed firms offer options (Liu and Lu 2007) and, thus, they should have little effect on our measures.

<sup>21</sup> In our setting,  $METR1 = ETR1/ATR = (\text{Taxable income} \times ATR / \text{Pre-tax book income}) / ATR = \text{Taxable income} / \text{Pre-tax book income}$ . Thus, *METR1*, in effect, reflects the proportion of taxable income to book income. Similarly, *METR2* indicates the proportion of taxable income to operating cash flows. Therefore, our METR measures specifically control for the effect of ATR on ETR. Our METR measures are similar in spirit to the measures examined in Amiram, Bauer, and Frank (2012), who use the statutory tax rate to control for the effect of tax rate differentials across countries on ETR measures. In our robustness tests, we also use book-tax differences as an alternative measure of tax avoidance.

## Regression Model

We test our first hypothesis with the following regression:

$$METR = \alpha_0 + \alpha_1 LG + \alpha_2 POST2002 + \alpha_3 LG * POST2002 + \alpha_4 \Delta ATR + \alpha_5 LEV + \alpha_6 SIZE + \alpha_7 SINTS + \alpha_8 ROA + \alpha_9 RIGHTS + \alpha_{10} AGE + \alpha_{11} GROWTH + \alpha_{12} DEFICIT + \alpha_{13} GDP + \varepsilon \quad (1)$$

where *METR* is the tax avoidance measure, as discussed above. *LG* is a dummy variable, coded as 1 if the firm's controlling shareholder is a local government agency or local government-controlled enterprise at the provincial or municipal level, and 0 otherwise. *POST2002* is a dummy variable, coded as 1 for all of the firm-year observations beginning in 2002, and 0 otherwise. According to H1, we expect a negative coefficient on *LG \* POST2002*.  $\Delta ATR$  is the change in ATR between years. An increasing ATR may incentivize LG firms to avoid taxes. We therefore include  $\Delta ATR$  to control for this effect.

We include a variety of other control variables that have been shown to be associated with tax avoidance (Chan, Lin, and Mo 2010; Shevlin et al. 2012; Tang and Firth 2011). Shevlin et al. (2012) find evidence that firms concerned with meeting minimum earnings thresholds to issue additional equities and intangible-intensive firms both engage in more tax-induced income shifting. To control for these effects, we include *RIGHTS* and *SINTS* in our regression. *RIGHTS* is an indicator variable that equals 1 if the firm obtains a rights offering in the next year, and 0 otherwise. *SINTS* is a measure of intangible assets scaled by total assets. Following previous studies, we also include *LEV* (total liabilities divided by total assets), *SIZE* (natural logarithm of a firm's total assets), *ROA* (pre-tax profit divided by total assets), *AGE* (number of years the firm has been listed), and *GROWTH* (the percentage change in sales between years). We expect firms with higher *LEV* and *AGE* to have more tax avoidance, whereas firms with higher *GROWTH* will have less. However, we do not have a sign prediction for *ROA* and *SIZE*, as better-performing and larger firms have more resources for tax planning, but they may be subject to a higher political cost. We include *DEFICIT* (the ratio of total local government expenditure to total local government revenue) and *GDP* (natural logarithm of local gross domestic product per capita) to control for the macro effect of local fiscal deficits and economic development on tax avoidance, respectively. We also include region and industry fixed effects.

To test our second hypothesis, we run Model (1) for two different subgroups: firms in which the local government's shareholding percentage is lower than the tax sharing ratio, and firms in which the local government's shareholding percentage is equal to or higher than the tax sharing ratio. We then compare the difference in regression results between the two subgroups.

We use the following model to test our third hypothesis:

$$AvgMETR = \beta_0 + \beta_1 RPIT + \beta_2 DEFICIT + \beta_3 REBR + \beta_4 GDP + \beta_5 POST2002 + \delta \quad (2)$$

where *AvgMETR* is the average tax avoidance at a province-year level. We estimate the average *METR1* and *METR2* for each province in a given year for the LG and CG subgroups, respectively, and run Model (2) for the two subgroups. *RPIT* is the ratio of the provincial revenue gained from the profit distribution of government-controlled firms to that from income tax sharing. A higher ratio indicates a province with a greater profit distribution. *DEFICIT* is defined as above, and a higher *DEFICIT* implies that local government has more incentives to seek extra-budgetary revenue. *REBR* is a proxy for the ability of local government to expropriate assets from the business sector to cover shortages, measured as the ratio of extra-budgetary revenue from administrative fees and penalties other than revenue from government-controlled firms' profit distribution to total government revenue. *GDP*, as defined above, is included to control for the wealth effect on the region. We expect negative coefficients on *RPIT* and *DEFICIT*, and a positive coefficient on *REBR* for LG firms. As the relationship between tax avoidance and the fiscal conditions of local governments may be different in the pre- and post-2002 periods, we include *POST2002* to control for this effect. However, our main interest is to assess the overall relationship between a province's fiscal conditions and its tax avoidance. Region fixed effects are included. Appendix B provides a complete list of variable definitions.

## Sample Selection

Our sample is drawn from all the A-share firms listed on the Shanghai and Shenzhen Stock Exchanges during the 1999–2006 period.<sup>22</sup> We determine the nature of firm ownership and the ATR from the annual financial reports. Other financial information is extracted from the China Stock Market and Accounting Research (CSMAR) database. Macroeconomics and fiscal data, such as GDP, total government revenue, and expenditure by region, are collected from the National Bureau of Statistics of China (see: <http://www.stats.gov.cn/english/>).

<sup>22</sup> We limit our sample to the 1999–2006 period because our focus is local governments' responses to the change in the tax sharing ratio following the 2002 reform. We stop in 2006 to avoid the possible confounding effect of China's adoption of international financial reporting standards (IFRS) in 2007 and China's major tax reform enacted in 2007 (effective in 2008). Although there were some accounting changes over the sample period, they affect both CG and LG firms and should be controlled to a large extent by our difference-in-differences research design.



Beginning with a population of 9,900 listed A-share firm-year observations from the 1999–2006 period in China, we obtain 5,201 observations for our tests after excluding: (1) firms listed after 2001, (2) firms in the finance sector, (3) firms with zero ATR, (4) firms with missing variables, and (5) non-government-controlled firms.<sup>23</sup> Panel A of Table 1 details the sample selection process. Panels B and C of Table 1 summarize the distribution of sample firms by year and industry, respectively. Based on the CSMAR industry classifications, our sample covers five industries, with a large proportion in the manufacturing industry sector. Relative to LG firms, CG firms focus more on manufacturing industries and public utilities.

To avoid the influence of outliers, we winsorize each continuous firm-level variable used in Model (1) at the 1 percent and 99 percent levels.<sup>24</sup> Panel A of Table 2 tabulates the summary statistics of the firm characteristics for the samples partitioned by ownership and period, and the univariate tests of mean differences.<sup>25</sup> As shown in Column (1), over the observation period, although LG firms are more intangible-intensive (*SINTS*) and more likely to have rights offerings (*RIGHTS*), they also have lower earnings (*ROA*), are smaller in size (*SIZE*), and have lower controlling ownership (*FIRSTSH*) and growth rate (*GROWTH*) than do CG firms. We partition our sample into pre- and post-2002 subgroups and find that the differences between LG and CG firms in the two periods do not substantially change. We also test for changes in the firm characteristics across the pre- and post-2002 periods for LG and CG firms. Column (4) shows that LG firms undergo more significant changes than CG firms.

We also report the descriptive statistics for the components of the tax variables and note a significant difference in *ATR* and  $\Delta ATR$  between LG and CG firms. The significant increase in *ATRs* for LG firms after 2002 is due to the cessation of tax rebates.<sup>26</sup> In Table 2, Column (4), we see an increasing trend in *ATR* and  $\Delta ATR$  for both LG and CG firms after 2002, indicating the importance of adjusting ETRs by *ATRs* to measure tax-aggressiveness, and control for  $\Delta ATR$  in our regression model.

Panel B of Table 2 presents the trends in tax avoidance of LG and CG firms. It shows that LG firms exhibit increasing tax avoidance after 2002, as measured by *METR1* and *METR2*. However, CG firms have a higher *METR1* after 2002 than before 2002. After further subgrouping CG firms into sharing and non-sharing CG firms, we find that non-sharing CG firms pay more taxes after 2002. These results suggest that the change in the tax sharing ratio following the 2002 reform does affect government-controlled firms' tax reporting decisions. Panel C presents the Pearson correlation matrix for all of the variables used in Model (1). *METR1* and *METR2* are correlated at 0.22, suggesting that they reflect different measures of profits (earnings versus cash flows). The tax avoidance measures are negatively correlated with *SINTS*, *AGE*,  $\Delta ATR$ , and *DEFICIT*, but positively correlated with *SIZE*, *ROA*, and *GROWTH*. In line with our predictions, *METR1* and *METR2* are negatively correlated with *LG \* POST2002*.

## V. EMPIRICAL RESULTS

### The Effects of the 2002 Tax Sharing Reform on Tax Avoidance

Table 3 presents the results of Model (1). Columns (1) and (2) present the regression results using the *METR1* and *METR2* specifications, respectively.<sup>27</sup> In the pre-2002 period, LG and CG firms have weak incentives to avoid taxes because all tax

<sup>23</sup> Our research question is whether the exacerbated intergovernmental agency conflicts affect local governments' incentives and, thus, the LG firms' decisions. For ease of interpretation, we restrict our sample to LG and CG firms to compare the tax avoidance level before and after 2002 among government-controlled firms, as they are commonly perceived to have weak incentives to avoid taxes. We include non-government-controlled (non-SOE) firms in our sensitivity tests. To compare the variation in tax avoidance across the two periods, we limit our sample to firms that were listed before 2002.

<sup>24</sup> Our results are robust to trimming variables with extreme values (i.e., beyond the 1st and 99th percentiles).

<sup>25</sup> We also performed the tests for median differences. The untabulated results are similar to those for the mean tests.

<sup>26</sup> Tax rebates are designed to encourage more investment in a jurisdiction by refunding part of a firm's income tax (up to 18 percent of taxable income). As listed firms pay a basic rate of 33 percent, their ATR can be reduced to 15 percent. The rebates ended after 2002 (Shevlin et al. 2012), resulting in an increase in ATR for firms that had previously been granted a tax rebate. For example, in our sample, the mean ATR for LG (CG) firms jumped significantly from 17 percent (18 percent) in 2001 to 26 percent (20 percent) in 2002, and remains stable at 25 percent (21 percent) from 2003 onward. Similarly, the mean of ETR1 for LG (CG) firms jumped from 15.5 percent (15.8 percent) in 2001 to 21.1 percent (17.7 percent) in 2002 and remains stable in the range of 19.4–21.5 percent (17.0–19.4 percent) for the 2003–2006 period.

<sup>27</sup> The validity of the difference-in-differences method relies on the parallel trend assumption in which the trend in the outcome variables for both the treatment and control groups during the pre-treatment era should be similar. To test the parallel trend assumption, we first plot the distributions of *METR1* and *METR2* for LG and CG firms between the two periods using Kernel density. The Kernel density plots show that the distributions maintain a similar pattern for LG and CG firms in the pre-2002 sample, but show increasingly different patterns in the post-2002 sample. In addition, Kolmogorov-Smirnov tests suggest that there is no significant difference in the distributions of *METR1* and *METR2* between LG and CG firms in the pre-2002 sample, but there are significant differences in the post-2002 sample. These results suggest that the parallel trend assumption is valid for our research design.

**TABLE 1**  
**Sample Selection and Distribution**

**Panel A: Sample Selection**

	<u>Firm-Year Observations</u>
A-share population	9,900
Excluded:	
Firms listed after 2001	(1,214)
Firms in the financial sector	(52)
Firms with zero ATR	(172)
Firms with missing variables	(1,177)
Non-government controlled firms	(2,084)
Final pooled sample	5,201

**Panel B: Sample Distribution by Year**

	<u>LG</u>		<u>CG</u>		<u>All</u>	
<u>Year</u>	<u>n</u>	<u>Freq.</u>	<u>n</u>	<u>Freq.</u>	<u>n</u>	<u>Freq.</u>
1999	247	0.06	59	0.05	306	0.06
2000	278	0.07	72	0.06	350	0.07
2001	610	0.15	160	0.13	770	0.15
2002	635	0.16	181	0.15	816	0.16
2003	595	0.15	190	0.16	785	0.15
2004	568	0.14	183	0.15	751	0.14
2005	545	0.14	184	0.15	729	0.14
2006	505	0.13	189	0.16	694	0.13
Total	3,983	1.00	1,218	1.00	5,201	1.00

**Panel C: Sample Distribution by Industry**

	<u>LG</u>		<u>CG</u>		<u>All</u>	
<u>Industry</u>	<u>n</u>	<u>Freq.</u>	<u>n</u>	<u>Freq.</u>	<u>n</u>	<u>Freq.</u>
Public Utility	362	0.09	142	0.12	504	0.10
Real Estate	229	0.06	54	0.04	283	0.05
Conglomerates	270	0.07	61	0.05	331	0.06
Manufacturing	2,680	0.67	907	0.75	3,587	0.69
Commercial	442	0.11	54	0.04	496	0.10
Total	3,983	1.00	1,218	1.00	5,201	1.00

This table presents the sample selection process and sample distribution by year and by industry. The population consists of all the A-share firms listed on the Shanghai and Shenzhen Stock Exchanges during the 1999–2006 period. The industry codes are based on CSMAR industry classifications. The LG sample includes firms in which the controlling shareholder is a local government agency or local government-controlled enterprise at the provincial, municipal, or county level. The CG sample includes firms in which the controlling shareholder is a central government agency or central government-controlled enterprise.

payments belong to local governments and the central government, respectively. The coefficient on *LG* is positive, indicating that LG firms practice *less* tax avoidance than CG firms in the pre-2002 period. This is probably because the local governments' ownership in LG firms is significantly lower than the central government's ownership in CG firms (45.7 versus 48.9 percent; see Panel A of Table 2). This means that LG firms have a larger percentage of outside shareholders, which makes it more advantageous for LG firms to reduce profit sharing with outside shareholders by paying more taxes. However, the intergovernmental agency relationship is different in the post-2002 period. The coefficients on *LG \* POST2002* are negatively significant for *METR1* and *METR2*, respectively, indicating that LG firms become more tax-aggressive than CG firms in the post-2002 period, compared with the pre-2002 period.

**TABLE 2**  
**Descriptive Statistics**

**Panel A: Firm Characteristics by Ownership and Period**

Variables	(1) All Sample			(2) Pre-2002			(3) Post-2002			(4) Pre- versus Post-2002	
	LG	CG	t-stat	LG	CG	t-stat	LG	CG	t-stat	LG	CG
LEV	0.069	0.067	0.62	0.064	0.063	0.190	0.071	0.068	0.71	-2.03**	-0.74
SIZE	21.189	21.438	-7.87***	20.915	21.148	-4.26***	21.298	21.530	-6.15***	-12.96***	-4.89***
SINTS	0.038	0.027	6.79***	0.034	0.029	1.55	0.039	0.026	7.04***	-2.65**	1.26
ROA	0.022	0.033	-3.87***	0.028	0.037	-1.54	0.020	0.032	-3.72***	2.81***	0.95
RIGHTS	0.033	0.017	2.87***	0.087	0.034	3.03***	0.012	0.012	-0.07	12.26***	2.58***
AGE	6.323	6.346	-0.23	4.118	4.151	-0.22	7.202	7.036	1.50	-31.99***	-16.29***
GROWTH	0.069	0.101	-4.98***	0.041	0.068	-2.34**	0.080	0.111	-4.01***	-6.17***	-2.93***
FIRSTSH	0.446	0.469	-4.18***	0.457	0.489	-2.76**	0.442	0.463	-3.39***	2.59**	2.18**
ATR	0.230	0.202	9.72***	0.168	0.180	-3.12***	0.255	0.209	13.89***	-30.53***	-5.15***
ΔATR	0.015	0.005	6.08***	0.003	0.000	1.01	0.020	0.006	6.42***	-8.97***	-2.48***
ETR1	0.193	0.176	2.80***	0.151	0.147	0.45	0.209	0.186	3.32***	-9.36***	-3.44***
ETR2	0.144	0.141	0.38	0.144	0.127	1.19	0.143	0.145	-0.26	0.13	-1.29
METR1	0.918	0.934	-0.54	0.967	0.857	1.93**	0.898	0.958	-1.76**	2.20**	-1.74*
METR2	0.701	0.761	-1.60	0.921	0.761	1.72*	0.613	0.761	-3.84***	7.83***	-0.00
CFO	0.050	0.057	-3.07***	0.042	0.051	-1.85**	0.053	0.060	-2.26**	-4.26***	-1.59
MTBV	2.819	2.719	1.44	3.231	3.246	-0.10	2.654	2.553	1.36	7.78***	5.06***
n	3,983	1,218		1,135	291		2,848	927		3,983	1,218

**Panel B: Means of Tax Avoidance Measures before and after 2002**

Variables	LG Firms (n = 3983)			CG Firms (n = 1218)			Tax Sharing CG Firms (n = 1038)			Non-Sharing CG Firms (n = 180)		
	Pre-2002	Post 2002	t-stat	Pre-2002	Post-2002	t-stat	Pre-2002	Post-2002	t-stat	Pre-2002	Post 2002	t-stat
METR1	0.967	0.898	2.20**	0.857	0.958	-1.74*	0.838	0.926	-1.35	0.954	1.147	-1.68*
METR2	0.921	0.613	7.83***	0.761	0.761	-0.00	0.769	0.699	0.84	0.717	1.132	-1.69*
n	1,135	2,848		291	927		243	795		48	132	

**Panel C: Pearson Correlations**

	METR1	1	2	3	4	5	6	7	8	9	10	11	12	13
1. METR2	<b>0.217</b>													
2. LG	-0.008	-0.022												
3. POST2002	-0.016	<b>-0.093</b>	<b>-0.044</b>											
4. LG * POST2002	<b>-0.029</b>	<b>-0.098</b>	<b>0.608</b>	<b>0.676</b>										
5. LEV	-0.023	<b>-0.042</b>	0.009	<b>0.029</b>	0.027									
6. SIZE	<b>0.094</b>	<b>0.035</b>	<b>-0.109</b>	<b>0.179</b>	<b>0.057</b>	<b>0.292</b>								
7. SINTS	<b>-0.079</b>	<b>-0.050</b>	<b>0.094</b>	0.024	<b>0.088</b>	-0.015	<b>-0.193</b>							
8. ROA	<b>0.242</b>	<b>0.219</b>	<b>-0.054</b>	<b>-0.039</b>	<b>-0.064</b>	0.014	<b>0.274</b>	<b>-0.115</b>						
9. RIGHTS	0.008	<b>0.038</b>	<b>0.040</b>	<b>-0.171</b>	<b>-0.116</b>	0.017	<b>-0.050</b>	-0.022	<b>0.109</b>					
10. AGE	<b>-0.037</b>	<b>-0.103</b>	-0.003	<b>0.441</b>	<b>0.313</b>	<b>-0.045</b>	<b>0.091</b>	<b>0.088</b>	<b>-0.122</b>	<b>-0.144</b>				
11. GROWTH	<b>0.102</b>	<b>0.094</b>	<b>-0.069</b>	<b>0.096</b>	0.022	-0.016	<b>0.188</b>	<b>-0.097</b>	<b>0.323</b>	0.021	-0.005			
12. ΔATR	<b>-0.078</b>	<b>-0.051</b>	<b>0.084</b>	<b>0.124</b>	<b>0.156</b>	-0.010	<b>-0.045</b>	0.012	<b>-0.054</b>	-0.010	<b>-0.104</b>	<b>-0.036</b>		
13. DEFICIT	<b>-0.037</b>	<b>-0.035</b>	<b>0.063</b>	<b>0.062</b>	<b>0.083</b>	<b>0.049</b>	<b>-0.136</b>	0.021	<b>-0.082</b>	-0.025	<b>-0.101</b>	<b>-0.043</b>	0.011	
14. GDP	<b>0.055</b>	-0.011	<b>-0.120</b>	<b>0.285</b>	<b>0.117</b>	<b>-0.068</b>	<b>0.256</b>	<b>-0.059</b>	<b>0.044</b>	<b>-0.081</b>	<b>0.440</b>	<b>0.040</b>	<b>-0.085</b>	<b>-0.367</b>

(continued on next page)

TABLE 2 (continued)

\*, \*\*, \*\*\* Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table provides descriptive statistics for sample firms. Panel A presents the summary statistics of firm characteristics for the samples partitioned by ownership and period. The t-tests are used to compare the mean difference of each variable between CG and LG firms and between periods. The LG sample includes any firm in which the controlling shareholder is a local government agency or local government-controlled enterprise at the provincial or municipal level. The CG sample includes any firm in which the controlling shareholder is a central government agency or central government-controlled enterprise. Panel B presents the trends in tax avoidance before and after 2002 for LG firms and CG firms. Panel C details the Pearson correlation matrix for all of the variables used in our regression Model (1). Figures in bold are significant at the 5 percent level. All of the variables are defined in Appendix B.

The coefficient on *POST2002* in Table 3 is positive and significant using *METR1*, indicating that CG firms pay more taxes in the post-2002 period than in the pre-2002 period. This result is mainly driven by non-sharing CG firms (see Panel B of Table 2). The coefficient on  $\Delta ATR$  is negatively significant, indicating that the increase in ATR motivates firms to avoid more taxes. Consistent with previous studies (Shevlin et al. 2012; Graham and Tucker 2006), we find that government-controlled firms with a high leverage ratio (*LEV*) and high intangible assets (*SINTS*) are more likely to engage in tax avoidance. Consistent with the univariate test results and previous literature (e.g., Minnick and Noga 2010), we find that young and better-performing government-controlled firms engage in less tax avoidance.

### The Effects of Local Government Shareholding Percentage on Tax Avoidance

To test our second hypothesis, whether the effects of the 2002 reform on tax avoidance are more pronounced when local governments' shareholding is equal to or higher than the tax sharing ratio, we separate our sample into two subgroups and rerun the regression. In Group 1, we limit our sample to firms with a governmental ownership percentage lower than 40 percent. As Columns (3) and (4) of Table 3 reveal, the coefficients on *LG \* POST2002* are no longer significant based on both *METR1* and *METR2*, suggesting that these LG firms have little incentive to engage in tax avoidance, as the ownership percentage is lower than the tax sharing percentage. In Group 2, our sample consists of firms with a government shareholding equal to or above 40 percent. The coefficients on *LG \* POST2002* in Columns (5) and (6) are negatively significant at the 5 percent and 1 percent levels, respectively.<sup>28</sup> Consistent with our prediction in H2, the results suggest that when the local governments' shareholding ratio is equal to or higher than the tax sharing ratio, the local government is more likely to take the tax avoider position rather than the tax collector position. The *POST2002* for *METR1* is positively significant in Group 2, but not for Group 1, suggesting that the CG firms in Group 2 pay more taxes after 2002, due to the decline in government ownership.<sup>29</sup> As an additional test, we adjust our cutoff point to 50 percent because the tax sharing ratio in 2002 is 50 percent. The results (untabulated) remain unchanged. The coefficients on *LG \* POST2002* for firms with an ownership percentage equal to or higher than 50 percent are negatively significant at the 10 percent level ( $\beta = -0.203$  for *METR1* and  $\beta = -0.232$  for *METR2*). Similar to Columns (3) and (4), the coefficients on *LG \* POST2002* are not significant for firms with less than 50 percent ownership, confirming that the negative coefficients on *LG \* POST2002* in Columns (1) and (2) are largely driven by firms whose ownership percentage is higher than the tax sharing ratio after 2002.<sup>30</sup>

In our main regression analysis, we use only government-controlled firms to investigate whether the intergovernmental agency problem affects the variation in tax avoidance magnitude for CG and LG firms before and after 2002. As a robustness check, we contrast LG firms with non-SOE firms separately (see Group 1 of Table 4). Owners of non-SOE firms share no tax revenue, so they should be more tax-aggressive than government-controlled firms. However, non-SOE firms are also subject to more extensive tax audits (Chen et al. 2011; Chan and Mo 2000). Given that the tax avoidance incentive for non-SOE firms is

<sup>28</sup> These results suggest that the change in the tax sharing ratio after the 2002 reform leads to a reduction of 5.31 percent ( $0.231 * ATR [= 0.230]$ ) in ETR1 or 6.92 percent ( $0.301 * 0.230$ ) in ETR2 for LG firms with 40 percent or more shareholding. Given that the mean pre-tax book income (operating cash flow) is RMB269 million (RMB411 million), a reduction in ETR1 (ETR2) of 5.31 percent (6.92 percent) roughly translates into a tax saving of RMB14.28 million (RMB28.45 million) for an average firm per year.

<sup>29</sup> In Group 2, CG's firm ownership percentage declines from 59.9 percent before 2002 to 57.5 percent after 2002 ( $t = 2.60$ ). For Group 1 CG firms, the difference between pre- and post-2002 is insignificant (from 28.2 to 28.1 percent). There is also a comparable decline in government ownership for LG firms after 2002. The decline is mainly due to the privatization policy that reduces government ownership in SOEs by selling government-owned shares to private investors subject to the CG's approval and capital market conditions (Ma 2008).

<sup>30</sup> Standard errors are clustered by region because the behavior is driven by local governments and not independent across firms. All of the results in Table 3 are robust to clustering by firm. We also perform a sensitivity test by comparing the difference in the level of tax avoidance before and after 2003 (instead of 2002) using the 40 percent cutoff point, and our results remain unchanged.



**TABLE 3**  
**The Effect of the 2002 Tax Sharing Reform on Tax Avoidance**

Variables	Pre. Sign	Full Sample		Group 1: <i>FIRSTSH</i> < 0.40		Group 2: <i>FIRSTSH</i> ≥ 0.40	
		(1) <i>METR1</i>	(2) <i>METR2</i>	(3) <i>METR1</i>	(4) <i>METR2</i>	(5) <i>METR1</i>	(6) <i>METR2</i>
<i>LG</i>	+	0.143** (2.22)	0.192** (2.43)	0.064 (0.88)	0.063 (0.55)	0.180* (1.90)	0.238** (2.43)
<i>POST2002</i>	?	0.152** (2.56)	0.080 (1.18)	−0.026 (−0.24)	−0.069 (−0.67)	0.259*** (4.48)	0.148 (1.57)
<i>LG * POST2002</i>	−	−0.148* (−2.03)	−0.283*** (−3.42)	−0.000 (−0.01)	−0.205 (−1.64)	−0.231** (−2.57)	−0.301*** (−2.99)
<i>ΔATR</i>	−	−1.231*** (−5.41)	−0.865*** (−3.68)	−1.114*** (−4.50)	−0.294 (−0.74)	−1.347*** (−4.34)	−1.271*** (−4.09)
<i>LEV</i>	−	−0.284** (−2.40)	−0.592*** (−3.14)	0.044 (0.16)	−0.198 (−0.74)	−0.622*** (−3.48)	−0.859*** (−2.88)
<i>SIZE</i>	?	0.022 (0.80)	−0.017 (−0.83)	0.088*** (3.06)	0.037* (1.82)	−0.012 (−0.43)	−0.052* (−1.79)
<i>SINTS</i>	−	−0.663** (−2.13)	−0.438 (−1.19)	−0.612 (−1.42)	−0.505 (−1.38)	−1.021** (−2.46)	−0.434 (−0.58)
<i>ROA</i>	?	2.275*** (17.00)	2.569*** (10.70)	2.392*** (17.95)	2.096*** (8.24)	2.002*** (7.71)	2.943*** (5.10)
<i>RIGHTS</i>	−	−0.114** (−2.68)	−0.046 (−0.43)	−0.145*** (−3.14)	0.021 (0.12)	−0.100 (−1.57)	−0.083 (−0.86)
<i>AGE</i>	−	−0.013** (−2.38)	−0.024** (−2.54)	−0.019** (−2.53)	−0.022 (−1.34)	−0.009 (−0.75)	−0.025** (−2.10)
<i>GROWTH</i>	+	0.089 (1.08)	0.225*** (3.27)	0.148 (1.63)	0.341** (2.71)	0.038 (0.38)	0.128 (1.50)
<i>DEFICIT</i>	?	−0.011 (−0.22)	−0.032 (−0.51)	0.085 (1.00)	−0.013 (−0.12)	−0.082 (−1.23)	−0.045 (−0.54)
<i>GDP</i>	?	−0.001 (−0.36)	0.001 (0.34)	0.006 (1.09)	0.004 (0.61)	−0.007 (−1.52)	−0.002 (−0.54)
<i>n</i>		5,201	5,201	2,173	2,173	3,028	3,028
<i>R</i> <sup>2</sup>		0.071	0.064	0.097	0.069	0.059	0.058

\*, \*\*, \*\*\* Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table presents the regression results of the effect of the 2002 reform on tax avoidance. Industry and region fixed effects are included. Standard errors are computed after clustering by region. The two-tailed t-statistics are reported in parentheses.

All of the variables are defined in Appendix B.

not related to the change in tax sharing ratio, we expect that the coefficients on *LG \* POST2002* will also be negative as *LG* firms become more tax-aggressive after 2002. The results in Table 4 (Group 1) are consistent with this expectation.

In our sample, the majority of CG firms that have tax revenue assigned exclusively to the central government in the pre-2002 period must share tax revenue with local governments in the post-2002 period (1,038 firm-years).<sup>31</sup> Including these tax sharing CG firms in our sample narrows the difference in tax avoidance between CG and LG firms in the post-2002 period because these CG firms also have tax avoidance incentives in the post-2002 period. However, their tax avoidance incentive should be weaker than that of LG firms as the central government has a much bigger share of tax revenue (60 percent as opposed to 40 percent for the local governments). In contrast, non-sharing CG firms should have little incentive to avoid taxes. To further confirm the effects of the tax sharing arrangements on LG firms' tax avoidance, we rerun regressions for three additional subgroups that use CG firms as a control group. In Table 4, Group 2 contrasts LG

<sup>31</sup> Note that we remove all of the firms in the finance sector from our sample. Also, some monopoly CG firms are not listed firms. These CG firms do not share tax revenue with LG before or after 2002.

**TABLE 4**  
**Tax Avoidance of LG Firms and Control Groups**

	Group 1: LG versus Non-SOE Firms		Group 2: LG versus Non-Sharing CG		Group 3: LG versus Sharing CG		Group 4: LG versus Sharing CG (Post-2003)	
	(1) <i>METR1</i>	(2) <i>METR2</i>	(3) <i>METR1</i>	(4) <i>METR2</i>	(5) <i>METR1</i>	(6) <i>METR2</i>	(7) <i>METR1</i>	(8) <i>METR2</i>
<i>LG</i>	0.177*** (3.72)	−0.012 (−0.14)	0.137* (1.74)	0.314*** (3.61)	0.149** (2.06)	0.172* (1.76)	0.141* (1.94)	0.181* (1.85)
<i>POST2002</i>	0.151*** (2.80)	−0.200** (−2.30)	0.266** (2.05)	0.535*** (3.15)	0.132* (2.02)	0.003 (0.04)	0.080 (1.07)	0.017 (0.19)
<i>LG * POST2002</i>	−0.140*** (−2.77)	−0.005 (−0.05)	−0.259*** (−2.94)	−0.714*** (−4.12)	−0.130 (−1.42)	−0.209** (−2.20)	−0.149* (−1.68)	−0.248** (−2.31)
<i>ΔATR</i>	−1.428*** (−6.26)	−0.926*** (−4.39)	−1.324*** (−4.92)	−0.915*** (−3.66)	−1.261*** (−5.45)	−0.847*** (−3.78)	−1.471*** (−2.84)	−1.138** (−2.08)
<i>LEV</i>	−0.084 (−0.68)	−0.530*** (−3.38)	−0.101 (−0.67)	−0.338 (−1.67)	−0.284** (−2.23)	−0.608*** (−3.29)	−0.240* (−2.00)	−0.669*** (−3.39)
<i>SIZE</i>	0.057*** (2.78)	0.034* (1.86)	0.039 (1.23)	−0.001 (−0.06)	0.031 (1.09)	−0.006 (−0.30)	0.029 (1.00)	−0.004 (−0.19)
<i>SINTS</i>	−0.641** (−2.31)	−0.752*** (−3.36)	−0.779** (−2.27)	−0.537* (−1.79)	−0.714** (−2.20)	−0.490 (−1.36)	−0.774** (−2.28)	−0.564 (−1.42)
<i>ROA</i>	1.551*** (18.76)	1.261*** (9.12)	1.777*** (13.60)	1.830*** (6.47)	1.774*** (13.84)	1.772*** (6.33)	1.787*** (14.14)	1.855*** (6.79)
<i>RIGHTS</i>	−0.047 (−1.12)	0.123 (1.28)	−0.078* (−1.89)	−0.017 (−0.15)	−0.096** (−2.16)	0.006 (0.05)	−0.079 (−1.61)	−0.036 (−0.29)
<i>AGE</i>	−0.015*** (−2.83)	−0.028*** (−3.18)	−0.008 (−1.31)	−0.018 (−1.41)	−0.016*** (−3.03)	−0.029*** (−3.10)	−0.009 (−1.42)	−0.020* (−1.98)
<i>GROWTH</i>	0.074 (1.15)	0.410*** (4.61)	0.149* (1.78)	0.305*** (3.44)	0.139* (1.95)	0.312*** (4.44)	0.136* (1.90)	0.324*** (4.33)
<i>DEFICIT</i>	−0.021 (−0.45)	−0.088** (−2.47)	−0.037 (−0.75)	−0.084 (−1.07)	−0.013 (−0.25)	−0.034 (−0.57)	−0.029 (−0.57)	−0.122 (−1.36)
<i>GDP</i>	−0.003 (−0.84)	0.001 (0.27)	−0.006 (−1.17)	−0.007* (−1.75)	−0.002 (−0.61)	0.002 (0.68)	0.001 (0.23)	−0.000 (−0.07)
<i>n</i>	5,929	5,929	4,163	4,163	5,021	5,021	4,205	4,205
<i>R</i> <sup>2</sup>	0.092	0.076	0.086	0.074	0.077	0.065	0.077	0.070

\*, \*\*, \*\*\* Denote two-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table compares the tax avoidance of LG firms with the tax avoidance of different control groups. Group 1 contrasts LG firms with non-SOE firms. Non-SOE firms are those not controlled by the government. Group 2 contrasts LG firms with CG firms that are not subject to tax sharing before and after 2002. Group 3 contrasts LG firms with CG firms that shared income tax revenue with local governments in the post-2002 period. Group 4 excludes firm-years in 2002 so that we can compare the tax avoidance between LG firms and sharing CG firms in two periods (1999–2001 versus 2003–2006). Industry and region fixed effects are included. Standard errors are computed after clustering by region. The two-tailed t-statistics are in parentheses.

All of the variables are defined in Appendix B.

firms with CG firms that are not subject to tax sharing in the post-2002 period (i.e., non-sharing CG firms). Group 3 contrasts LG firms with CG firms subject to tax sharing (i.e., sharing CG firms). We expect that the difference in tax avoidance between LG and CG firms in the post-2002 sample in Group 2 will be larger than that in Group 3 because sharing CG firms should also engage in tax avoidance when their tax revenue must be shared with local governments. As expected, the coefficients on *LG \* POST2002* in Columns (3) and (4) are more negative than those in Columns (5) and (6), particularly for *METR2* ( $\chi^2 = 6.58$ ,  $p\text{-value} = 0.01$ ). In light of the 40:60 tax sharing ratio, it is not surprising that LG firms avoid more taxes than tax sharing CG firms.

In Group 4 of Table 4, we compare LG firms with sharing CG firms across two periods, 1999–2001 versus 2003–2006 (i.e., we delete the 2002 firm-years from our sample). As the tax sharing ratio was changed from 50:50 in 2002 to 40:60 from 2003 onward, such a comparison should provide a sharper contrast between LG firms and sharing CG firms. The results in Columns (7) and (8) of Table 4 provide evidence that the reduction of the tax sharing ratio from 50 to 40 percent for LGs

**TABLE 5**  
**Descriptive Statistics for Tax Avoidance and Fiscal Variables at Province-Year Level**

By Province	Firm-Years	Freq.	AvgMETR1	AvgMETR2	RPIT	DEFICIT	REBR	GDP
Anhui	135	2.60	0.877	0.764	0.111	2.084	0.163	1.885
Beijing	321	6.17	1.024	0.897	0.006	1.179	0.044	3.486
Chongqing	139	2.67	0.822	0.506	0.396	2.036	0.177	2.010
Fujian	150	2.88	0.936	0.525	0.101	1.388	0.101	2.693
Gansu	86	1.65	0.761	0.802	0.238	3.303	0.092	1.656
Guangdong	662	12.73	0.920	0.705	0.081	1.216	0.091	2.821
Guangxi	103	1.98	1.188	0.805	0.747	2.019	0.168	1.787
Guizhou	72	1.38	0.893	0.901	0.230	2.678	0.129	1.406
Hainan	71	1.37	0.579	0.695	0.430	1.841	0.139	2.079
Hebei	164	3.15	0.899	0.701	0.133	1.802	0.156	2.354
Heilongjiang	120	2.31	0.956	0.860	0.534	2.276	0.090	2.440
Henan	130	2.50	0.901	1.125	0.324	1.980	0.149	2.050
Hubei	252	4.85	0.867	0.794	0.087	1.995	0.171	2.192
Hunan	139	2.67	0.827	0.930	0.354	2.112	0.204	2.016
Inner Mongolia	77	1.48	0.813	0.948	0.601	2.804	0.121	2.223
Jiangsu	270	5.19	0.991	0.836	0.070	1.271	0.088	2.836
Jiangxi	107	2.06	0.813	0.696	0.337	2.203	0.184	1.940
Jilin	146	2.81	0.823	0.694	0.286	2.708	0.143	2.219
Liaoning	225	4.33	0.945	0.838	0.222	1.711	0.114	2.661
Ningxia	57	1.10	0.705	0.569	0.439	3.330	0.100	1.928
Qinghai	38	0.73	1.097	1.002	0.316	4.853	0.076	1.958
Shaanxi	99	1.90	0.917	0.772	0.556	2.314	0.092	1.844
Shandong	290	5.58	0.956	0.901	0.210	1.355	0.128	2.629
Shanghai	516	9.92	1.037	0.699	0.000	1.181	0.036	3.812
Shanxi	113	2.17	1.060	1.092	0.080	1.942	0.113	2.034
Sichuan	254	4.88	0.852	0.663	0.302	2.120	0.141	1.877
Tianjin	103	1.98	0.922	0.896	0.003	1.418	0.110	3.298
Tibet	21	0.40	0.877	0.519	0.122	15.189	0.119	1.854
Xinjiang	68	1.31	0.848	0.700	0.289	2.783	0.103	2.287
Yunnan	83	1.60	1.011	0.831	0.094	2.442	0.081	1.765
Zhejiang	190	3.65	0.983	0.727	0.005	1.211	0.069	2.979
Mean			0.906	0.791	0.182	1.816	0.109	2.583
Median			0.901	0.700	0.096	1.554	0.102	2.522
Standard Deviation			0.240	0.409	0.259	1.109	0.049	0.698
Mean pre-2002			0.991	1.054	0.071	1.688	0.096	2.259
Mean post-2002			0.859	0.642	0.239	1.883	0.116	2.753

This table presents the descriptive statistics for tax and fiscal variables for government-controlled firms in our sample at the provincial level. All of the variables are defined in Appendix B.

provides a stronger tax avoidance incentive for LG firms. It is also interesting to note that the coefficient on *POST2002* for non-sharing CG firms in Group 2 is positively significant, whereas the *POST2002* coefficients for sharing CG firms in Group 4 are insignificant. Unlike non-sharing CG firms, sharing CG firms have weaker incentives to pay more taxes after 2002 because the central government must share the tax revenue from these firms with the local governments. These findings support our interpretation that the positive coefficient on *POST2002* in Table 3 is driven mainly by non-sharing CG firms.

### The Relationship between Fiscal Conditions and Tax Avoidance

Table 5 shows regional average tax avoidance and local government fiscal conditions in 31 different provinces (or tax jurisdictions) in China. We calculate *AvgMETR1* and *AvgMETR2* by averaging *METR1* and *METR2* for firms in each province per year. We use these average tax avoidance measures to assess the overall tax avoidance in a province, which is expected to

**TABLE 6**  
**The Association between Tax Avoidance and Local Fiscal Conditions**

	Pred. Sign	LG Firms (n = 248)		CG Firms (n = 221)	
		(1) <i>AvgMETR1</i>	(2) <i>AvgMETR2</i>	(3) <i>AvgMETR1</i>	(4) <i>AvgMETR2</i>
<i>RPIT</i>	—	−0.184* (−1.87)	−0.162* (−1.81)	0.033 (0.18)	−0.244 (−0.92)
<i>DEFICIT</i>	—	−0.037** (−2.54)	−0.158*** (−3.83)	−0.085 (−0.55)	0.230 (0.69)
<i>REBR</i>	+	1.187 (1.14)	1.608 (1.32)	0.742 (0.35)	−5.286 (−1.39)
<i>POST2002</i>	?	−0.107 (−1.63)	−0.261*** (−3.19)	0.114 (1.10)	0.048 (0.25)
<i>GDP</i>	?	−0.070 (−0.70)	−0.323*** (−2.77)	−0.145 (−1.17)	−0.096 (−0.28)
<i>R</i> <sup>2</sup>		0.141	0.322	0.013	0.031

\*, \*\*, \*\*\* Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table presents the regression results of the relationship between fiscal incentives and province-year average tax avoidance at the region-year level. *AvgMETR1* and *AvgMETR2* are the annual average tax avoidance in a region undertaken by LG or CG firms. Standard errors are computed after clustering by region. Region fixed effect is included. The two-tailed t-statistics are in parentheses. All of the variables are defined in Appendix B.

be associated with the fiscal conditions of the respective local government. As Table 5 indicates, all of the provinces have fiscal problems. The mean of *DEFICIT* is 1.82, suggesting that the average local government fiscal expenditure is almost twice its revenue. The average local fiscal deficit increases by 11.2 percent, from 1.69 pre-2002 to 1.88 post-2002. We also find that the mean ratio of profit distribution to shared tax revenue (*RPIT*) for the local governments increases rapidly from 7.1 percent to 23.9 percent, parallel to the increasing trend in the regional average tax avoidance after 2002.

Table 6 presents the regression results of Model (2) for LG and CG subsamples with province-year observations. Consistent with our prediction, the coefficients on *RPIT* and *DEFICIT* are significantly negative for LG firms, meaning that a high level of tax avoidance (i.e., a lower *AvgMETR*) is associated with a higher level of profit to tax distribution and a higher local deficit.<sup>32</sup> The size of the coefficients suggests that a one-unit increase in *DEFICIT* leads to a reduction of 3.7 percent in *AvgMETR1* and 15.8 percent in *AvgMETR2*. Not surprisingly, we find that the regional average tax avoidance for CG firms is unrelated to local fiscal conditions. In general, the results in Table 6 support our prediction that LG firms' tax avoidance is associated with local fiscal deficits and fiscal composition over our sample period.<sup>33</sup> These findings reinforce our previous inference that local governments cover their fiscal shortages by directing their controlled firms to avoid taxes.

### Dividend Tests

To reinforce our inference that LG firms avoid more taxes after 2002 than before 2002 as a means of increasing local governments' fiscal sources, we examine whether the increased tax savings of tax-aggressive LG firms in the post-2002 period are, in part, being paid back to local governments in the form of cash dividends. Our main interest here is to test whether tax-aggressive LG firms pay more cash dividends than tax-aggressive CG firms in the post-2002 period, and whether LG firms pay more dividends in the post-2002 period than in the pre-2002 period.<sup>34</sup> However, as many firms prefer to have a stable dividend policy, we may not be able to detect a change in dividend payment.

<sup>32</sup> There may be a reverse causality effect of tax avoidance on *RPIT* and *DEFICIT*. To test this effect, we reverse the regression. We regress *RPIT* (*DEFICIT*) on the regional tax avoidance measure (*AvgMETR1*/*AvgMETR2*) and other control variables. The results (untabulated) show that the coefficients on *AvgMETR1* and *AvgMETR2* are not significant, indicating that there is no significant reverse causality effect.

<sup>33</sup> As Table 5 shows, some provinces (e.g., Tibet, Qinghai, and Ningxia) are under-represented. The small sample size may affect our estimation of regional average tax avoidance at the province-year level. To mitigate this concern, we exclude provinces with firm-years lower than eight in each year for LG and CG groups and then reestimate *AvgMETR1* and *AvgMETR2*. Our results are not sensitive to this exclusion.

<sup>34</sup> We use cash dividends per share as our dependent variable to test whether tax avoidance provides LG firms with more cash resources to pay more dividends. We do not use the dividend payout ratio (Dividend/Net income) because while tax avoidance should increase the numerator of the ratio, it also increases the ratio's denominator.



The t-tests in Panel A of Table 7 show that tax-aggressive LG firms pay significantly more dividends per share in the post-2002 period than in the pre-2002 period, but this is not the case for CG firms.<sup>35</sup> In Panel B of Table 7, we find that (1) pre-2002, there is no significant difference in cash dividend payments between tax-aggressive LG and CG firms (Column (1)); (2) post-2002, tax-aggressive LG firms pay more cash dividends than CG firms at the 10 percent level (Column (2)); (3) tax-aggressive LG firms pay more cash dividends post-2002 than pre-2002 at the 10 percent level (Column (3)); and (4) there is no significant difference in dividend payment between the pre- and post-2002 periods for tax-aggressive CG firms (Column (4)). Table 3 shows that LG firms are more tax-aggressive than CG firms post-2002, and Table 2 shows that LG firms are more tax-aggressive post-2002 than pre-2002. Thus, the findings in Table 7 (especially Columns (2) and (3) of Panel B) indicate that after 2002, LG firms increase their after-tax profit through tax avoidance to increase local governments' cash flow.<sup>36</sup>

## VI. ADDITIONAL TESTS

### Propensity Score Matching Analysis

Given that there are significant differences in firm characteristics, including *ATR* and  $\Delta ATR$ , between LG and CG firms both pre- and post-2002 that may influence our results in Table 3 (although we control for these firm characteristics), we perform a propensity score matching (PSM) analysis. The PSM method further rules out the possibility that our results are driven by differences in firm characteristics. Moreover, this method mitigates the potential influence of firm characteristics on the parallel trend assumption (Chava and Purnanandam 2011).<sup>37</sup> We carefully match LG and CG firms on a one-to-one basis without replacement using the following criteria: (1) fiscal year, and (2) nearest *ATR*,  $\Delta ATR$ , *SIZE*, *ROA*, *SINTS*, *LEV*, and *RIGHTS*. The matching procedure yields a reduced sample of 1,156 matched pairs of LG and CG firm-years.<sup>38</sup> We rerun Model (1) based on the matched sample and report the results in Columns (1) and (2) of Table 8. We continue to find that LG firms avoid more taxes in the post-2002 period than in the pre-2002 period, suggesting that our previous inferences are not affected by firm characteristics. It is the change in the tax sharing ratio that determines LG firms' tax strategies.

### The Effects of Tax Rate Changes

To further verify that our main results are not driven by the *ATR* change, we hand-collect the tax rebate information from tax notes because most of the changes in *ATR* are due to the cessation of tax rebates after 2002. We define rebate firms as those that receive a rebate in the pre-2002 period, but not in the post-2002 period. These rebate firms have a significantly higher *ATR* in the post-2002 period due to the change in rebate status, whereas no-rebate firms do not.<sup>39</sup> As Columns (3) and (4) of Table 8 show, we find that our previous results hold for no-rebate firms, suggesting that our main results in Table 3 are not driven by tax rate changes due to tax rebates. In addition, we confine our sample to firms with the *same* *ATRs* (i.e., 15 percent) during our observation period. We rerun Model (1) and continue to find a significant and negative relationship between  $LG * POST2002$  and tax avoidance, as shown in Columns (5) and (6) of Table 8. These results further confirm that our main results are not driven by *ATR* changes.

### Alternative Measures, Control for Earnings Management, and Loss Firm Exclusion

In addition to our two modified *ETR* measures, we also use book-tax differences (*BTD*) as an alternative measure of tax avoidance. *BTD* is calculated as pre-tax income multiplied by *ATR* minus income tax expense, scaled by total assets. To make this measure comparable to *METR1* and *METR2*, we multiply *BTD* by  $-1$  so that a lower *BTD* is indicative of a higher level of

<sup>35</sup> We only use *METR1* to measure tax avoidance in this test because the denominator of *METR2* is operating cash flow, which confounds the effects of cash dividend payments and tax avoidance.

<sup>36</sup> The increase in dividend payments after 2002 may be supported by firms' earnings inflation rather than by more tax avoidance. We perform a robustness test by including the change in *ROA* ( $\Delta ROA$ ) in the regression to control for earnings fluctuation on dividend payments. The results are qualitatively similar to Table 7 (Panel B). Alternatively, we include a dummy variable, *INFL* ( $= 1$ , if  $DACC > 0$ , and 0 otherwise) in the regression to control for upward earnings management. We continue to find that the coefficients on  $LG * HTP$  and  $HTP * POST2002$  are positively significant.

<sup>37</sup> The parallel trend assumption may be problematic if pre-treatment characteristics that are thought to be associated with the dynamics of the outcome variable are unbalanced between the treated and the untreated groups (Abadie 2005). By matching on propensity scores, we balance the distribution of these characteristics in the treatment and control samples, before and after the reform.

<sup>38</sup> The mean tests indicate that there is no significant difference in means between LG and CG firms for each of the matching variables in the matched sample ( $p > 10$  percent, two-tailed). To further verify the quality of our matching, we also perform a standardized bias test as in DeFond, Erkens, and Zhang (2016). We find that the absolute mean standardized bias is less than 3 percent (ranging from 0.2 percent to 2.6 percent) for all of the matching variables, indicating that our sample has a good match.

<sup>39</sup> The means of the *ATR* are 15 percent and 32 percent for rebate firms in the pre-2002 and post-2002 periods, respectively. For the no-rebate firms, the means of *ATR* are 18 percent and 19 percent in the pre-2002 and post-2002 periods, respectively.

**TABLE 7**  
**Dividend Tests**

**Panel A: Descriptive Statistics and Univariate Tests on the Dependent Variable (*LogCASHDPS*)**

	The Mean of <i>LogCASHDPS</i> for LG Firms			The Mean of <i>LogCASHDPS</i> for CG Firms		
	Pre-2002	Post-2002	t-stat	Pre-2002	Post-2002	t-stat
<i>HTP</i> = 1	-2.290	-2.188	-2.17**	-2.255	-2.202	-0.61
n	426	781		135	282	
	(55.3%)	(56.1%)		(59.7%)	(55.3%)	
<i>HTP</i> = 0	-2.307	-2.332	0.47	-2.338	-2.250	-0.88
n	345	612		94	228	
	(44.7%)	(43.9%)		(40.3%)	(44.7%)	

The means of cash dividend per share (*CASHDPS*) are RMB0.130 and RMB0.153 for tax-aggressive LG firms and RMB0.136 and RMB0.154 for tax-aggressive CG firms, respectively, in the pre- and post-2002 periods. The difference between the pre- and post-2002 dividend per share for tax-aggressive LG firms is significant ( $t = 3.05$ ), but this is not the case for tax-aggressive CG firms ( $t = 1.34$ ).

**Panel B: Regression Results**

	<i>LogCASHDPS</i> (1) Pre-2002	<i>LogCASHDPS</i> (2) Post-2002	<i>LogCASHDPS</i> (3) LG	<i>LogCASHDPS</i> (4) CG
<i>LG</i>	0.013 (0.15)	-0.043 (-0.70)		
<i>HTP</i>	-0.058 (-0.78)	-0.140* (-1.80)	-0.075 (-1.46)	-0.023 (-0.43)
<i>LG * HTP</i>	-0.007 (-0.07)	0.180* (1.77)		
<i>POST2002</i>			-0.025 (-0.44)	0.107 (1.21)
<i>HTP * POST2002</i>			0.113* (1.78)	-0.113 (-1.21)
<i>LEV</i>	-0.074 (-0.23)	0.464 (1.63)	0.483 (1.67)	0.365 (0.85)
<i>SIZE</i>	0.135*** (3.47)	0.165*** (6.01)	0.183*** (8.38)	0.118*** (3.08)
<i>GROWTH</i>	-0.027 (-0.16)	0.182* (1.96)	0.178* (1.79)	0.016 (0.13)
<i>ROA</i>	10.536*** (8.49)	11.881*** (9.73)	11.471*** (10.75)	12.205*** (6.34)
<i>CFO</i>	0.060 (0.23)	0.305 (1.43)	0.379* (1.93)	-0.046 (-0.14)
<i>FIRSTSH</i>	0.116 (0.92)	0.190 (0.90)	0.073 (0.41)	0.323 (1.41)
<i>MTBV</i>	-0.075*** (-3.16)	-0.052 (-1.54)	-0.091*** (-5.12)	-0.013 (-0.44)
<i>GDP</i>	-1.366*** (-3.96)	-0.173* (-2.02)	-0.259*** (-3.20)	-0.056 (-0.44)
n	1,000	1,903	2,164	739
R <sup>2</sup>	0.332	0.402	0.364	0.454

\*, \*\*, \*\*\* Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table provides the descriptive statistics, univariate tests, and regression results for the dividend tests. Panel A presents the univariate test of mean cash dividend per share for LG and CG firms. Panel B presents the regression results for (1) LG and CG firms before 2002; (2) LG and CG firms after 2002; (3) LG firms before and after 2002; and (4) CG firms before and after 2002. *LogCASHDPS* is the natural logarithm of cash dividend per share. *HTP* equals 1 if the *METR1* of a firm is below the sample mean (i.e., tax-aggressive), and 0 otherwise. Unlike *ROA* in other tables, we use after-tax *ROA* in these dividend tests. Industry and region effects are included. Standard errors are computed by clustering by region. The two-tailed t-statistics are in parentheses.

All of the variables are defined in Appendix B.

**TABLE 8**  
**Additional Tests for the Effect of the 2002 Tax Sharing Reform on Tax Avoidance**

**Panel A: Controlling for ATR and Alternative Measure of Tax Avoidance**

	Firms with Matched ATR and $\Delta ATR$ (PSM Test)		Firms without Significant Change in ATR		Firms with the Same ATR		Alternative Measure of Tax Avoidance
	(1) <i>METR1</i>	(2) <i>METR2</i>	(3) <i>METR1</i>	(4) <i>METR2</i>	(5) <i>METR1</i>	(6) <i>METR2</i>	(7) <i>BTD</i>
<i>LG</i>	0.266*** (3.49)	0.170 (1.64)	0.0710 (0.96)	0.102 (1.24)	0.083 (1.08)	0.182* (2.09)	0.028*** (4.61)
<i>POST2002</i>	0.110 (1.45)	0.068 (0.92)	0.140** (2.82)	0.123 (1.40)	0.137* (1.89)	0.131 (1.62)	0.004 (0.67)
<i>LG * POST2002</i>	-0.219** (-2.20)	-0.254** (-2.53)	-0.154** (-2.37)	-0.160* (-1.88)	-0.215** (-2.73)	-0.219** (-2.16)	-0.031*** (-3.44)
$\Delta ATR$	-0.639* (-1.99)	-1.192** (-2.16)					-0.187*** (-6.30)
<i>DACC</i>							0.092*** (6.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	2,312	2,312	3,102	3,102	2,826	2,826	4,893
R <sup>2</sup>	0.064	0.076	0.111	0.048	0.085	0.056	0.454

**Panel B: Controlling for Earnings Management Loss Firms and Market Competition and Alternative Measure of Ownership**

	Control for Earnings Management		Continuous Measure		Profitable Firms		Market Competition Control	
	(8) <i>METR1</i>	(9) <i>METR2</i>	(10) <i>METR1</i>	(11) <i>METR2</i>	(12) <i>METR1</i>	(13) <i>METR2</i>	(14) <i>METR1</i>	(15) <i>METR2</i>
<i>LG</i>	0.135** (2.36)	0.120 (1.14)	0.317** (2.53)	0.343*** (2.93)	0.132* (2.02)	0.214** (2.36)	0.138** (2.09)	0.189** (2.41)
<i>POST2002</i>	0.133** (2.30)	0.043 (0.49)	0.167** (2.44)	0.015 (0.25)	0.128* (1.78)	0.074 (0.89)	0.135** (2.34)	0.071 (1.07)
<i>LG * POST2002</i>	-0.139** (-2.12)	-0.219** (-2.17)	-0.368*** (-2.90)	-0.438*** (-2.78)	-0.138* (-1.81)	-0.295*** (-3.11)	-0.143* (-1.93)	-0.281*** (-3.42)
$\Delta ATR$	-1.246*** (-5.48)	-0.880*** (-3.74)	-1.203*** (-5.41)	-0.867*** (-3.61)	-1.237*** (-5.44)	-0.929*** (-3.10)	-1.232*** (-5.54)	-0.866*** (-3.65)
<i>DACC</i>	0.220* (1.73)	1.084*** (4.08)						
<i>SOE_SALE</i>							0.326 (1.17)	0.170 (0.69)
<i>DFI</i>							-1.752*** (-5.89)	-0.996** (-2.21)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,893	4,893	5,201	5,201	4,476	4,476	5,201	5,201
R <sup>2</sup>	0.069	0.068	0.072	0.064	0.037	0.056	0.073	0.064

\*, \*\*, \*\*\* Denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

This table presents the robustness checks for the effect of the 2002 tax reform on tax avoidance. In Columns (1) and (2), we present the results for firms with matched ATR,  $\Delta ATR$ , and other firm characteristics using propensity score matching analysis. In Columns (3) and (4), we report the results for firms with no tax rebate, while we restrict our sample to firms with the same ATR in Columns (5) and (6). In Column (7), we use an alternative measure of tax avoidance, i.e., *BTD*. We multiply *BTD* by -1 so that a smaller *BTD* implies a higher level of tax avoidance. *DACC* is included in Columns (7), (8), and (9) to control for the earnings management effect. *LG* (*CG*) in Columns (10) and (11) denotes the ownership percentage held by the local (central) government as a controlling shareholder. In Columns (12) and (13), we confine our sample to profitable firms. *SOE\_SALE* and *DFI* are included in Columns (14) and (15) to control for the effect of increasing market competition. *SOE\_SALE* is the annual provincial sales of SOEs divided by the annual national sales of SOEs. *DFI* is the ratio of the annual direct foreign investment received by a province to the annual direct foreign investment received by the country. All other control variables are the same as in Table 3, but not reported here for brevity. Industry and region fixed effects are included. The t-statistics are reported in parentheses. Standard errors are computed after clustering by region. The two-tailed t-statistics are in parentheses. All of the variables are defined in Appendix B.

tax avoidance. Also, as discussed earlier, upward earnings management boosts *BTD* and drives down the ETR measures. Thus, we include discretionary accruals (*DACC*) in Model (1) to control for the effects of earnings management on *BTD* and on our METR measures. *DACC* is the residuals estimated from the cross-sectional Jones model modified by Dechow, Sloan, and Sweeney (1995). As Columns (7), (8), and (9) of Table 8 reveal, the use of *BTD* as an alternative measure of tax avoidance and the inclusion of *DACC* as an additional control does not affect our results. The coefficient on  $LG * POST2002$  is significant and negative for each case.<sup>40</sup>

We also use a continuous variable for LG and CG firms where *LG* (*CG*) is referred to as the ownership percentage held by the local (central) government as a controlling shareholder. The continuous measures can indicate how the variation in government ownership affects tax avoidance. Columns (10) and (11) of Table 8 indicate that *LG* firms with high ownership avoid more taxes in the post-2002 period, substantially similar to the conclusion drawn from the results in Table 3.<sup>41</sup> In our main tests, we truncate ETR1 and ETR2 to [0,1] to mitigate the effects of loss firms on our tax avoidance measures. To further control for the effects of loss, we remove loss firms from our sample. Our previous inferences remain unchanged (see Columns (12) and (13) of Table 8).

### Market Competition

Since China's accession to the World Trade Organization (WTO) in 2001, market competition has tended to be fiercer for government-controlled firms, which may induce them to engage in more tax avoidance. We test for this effect by including two control variables: *SOE\_SALE* (total annual sales of SOEs in a region divided by total annual national sales of SOEs) and *DFI* (the ratio of the total annual direct foreign investment received by a region to the total annual direct foreign investment received by the country). We assume that the more direct foreign investment a region receives, the greater the competition for the SOEs in that region. In contrast, the greater the sales made by SOEs in a region, the less competition they may face. Columns (14) and (15) of Table 8 show that our main results are not sensitive to these controls.

## VII. CONCLUSIONS

This study extends the tax literature by investigating how intergovernmental agency conflicts under a tax sharing system affect local governments' tax enforcement and their controlled firms' tax avoidance strategies. China's institutional environment grants local governments dual roles: as tax collectors and controlling shareholders of listed firms that are subject to tax payments. As tax collectors, local governments want to collect more taxes to increase local fiscal revenue, while as dominant shareholders, they have incentives to avoid taxes to maximize their after-tax returns. The questions of how local governments balance these opposing incentives and which incentive dominates remain intriguing, but unexplored.

The change in the tax sharing ratio between the central and the local governments in China's 2002 reform provides an ideal setting for investigating whether intergovernmental agency conflicts engender local governments to behave in a manner that is against the central government's interests. We find that since the 2002 reform, local governments' tax avoidance incentive surpasses their tax collection incentive, especially when the local governments' ownership percentage in their controlled firms is higher than the tax sharing ratio. The change in the tax sharing ratio affects LG firms' tax avoidance decisions. In this study, we learn that (1) tax collectors can also be tax avoiders due to intergovernmental agency conflicts; (2) the role propensity of local governments (tax collector versus tax avoider) depends on the tax revenue sharing ratio and their ownership percentage in controlled listed firms, and that the difference in these two ratios also affects the tax avoidance of CG firms in the same direction; and (3) local fiscal conditions (e.g., local fiscal deficits and the profit-to-tax distribution ratio) are associated with the tax avoidance behavior of local government-controlled firms, consistent with our hypothesis that local governments expropriate central tax revenue to meet their financial needs through tax avoidance. Our findings demonstrate that central-local government tax sharing ratio and local fiscal condition are important determinants of tax avoidance in government-controlled firms, which we believe is a largely overlooked perspective in tax literature.

Although transitional economies pursue the privatization of state-owned enterprises to improve economic efficiency, they typically need to maintain sufficient state controls in the economy to achieve their social and economic objectives, especially by controlling corporations in key industries. Our findings have important policy implications for ongoing fiscal and tax reforms in China and other transitional economies with high government ownership of corporations and a fiscal decentralization system

<sup>40</sup> While *DACC* is a traditional measure of earnings management, it may be noisy. To further assess the effects of earnings change on our main results, we replace *DACC* by the change in pre-tax *ROA* ( $\Delta ROA$ ) as a measure of earnings shock in another robustness check. The results (untabulated) are similar to our main results in Table 3.

<sup>41</sup> We recognize that variation in government ownership may affect management culture, which may, in turn, affect manager behavior. However, we do not see any significant variation in the management culture of our sample firms given that they are all government-controlled and governed by people with a similar culture.



(e.g., Russia, India, Vietnam, and Turkey). Our results suggest that increasing the local proportion in the tax sharing system or reducing the local government ownership of listed firms should constrain local governments' opportunistic behavior and motivate them to fulfill their commitments to national interests. In addition, a fiscal system that mitigates local fiscal imbalances has the potential to attenuate agency problems and restrain local extra-budgetary practices that expropriate wealth from central tax revenue and private businesses. Needless to say, one must account for cross-country differences in tax systems and institutions in generalizing our results. Nevertheless, given the significance of government ownership in corporations and the prevalent tax revenue sharing in transitional economies, we believe that intergovernmental agency conflicts are unavoidable in such political-economic environments. Our research results shed lights on how to resolve such conflicts.

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## APPENDIX A

### Local Governments' Trade-Offs between Tax Collection and Tax Avoidance

Let  $x$  = profit before tax;  $t$  = the applicable tax rate;  $a$  = the proportion of ownership by LG;  $s$  = the share of tax retained by LG;  $d$  = dividend payout ratio; and  $Z$  = LG's payoff:

$$Z = xts + x(1-t)da + x(1-t)(1-d)a \quad (1)$$

where the payoff for LG is the sum of the tax sharing amount and the pro rata share of after-tax profit owned by LG (including dividends and its share of undistributed profits). From Equation (1), we have:

$$Z = xts + x(1-t)a, \text{ or } Z/x = ts + (1-t)a \quad (2)$$

Now, consider a lower effective tax rate  $t'$  due to tax avoidance, we have:

$$Z'/x = t's + (1-t')a \quad (3)$$

The differential payoff due to tax avoidance will be:

$$[Z' - Z]/x = (s - a)(t' - t), \text{ or } [Z' - Z] = x(s - a)(t' - t) \quad (4)$$

According to the above Equation (4), when an LG's tax sharing ratio is lower than its ownership percentage in LG firms (i.e.,  $s < a$ ), tax avoidance will be beneficial to the LG (i.e.,  $[Z' - Z] > 0$  because  $t' < t$ ). When  $s > a$ , tax avoidance will lower the LG's payoff.

#### An Illustration: Local Government Ownership in LG Firm is Higher (Lower) than the Tax Sharing Ratio (40 Percent)

Assume that the before-tax profit of an LG firm is RMB100 (corporate income tax rate: 23 percent [average ATR]):

	LG's Ownership Percentage	Before 2002 (No Sharing)			From 2003 (Sharing 60:40)		
		CG RMB	LG RMB	Minority RMB	CG RMB	LG RMB	Minority RMB
Share of tax revenue between CG and LG if the LG firm pays tax (RMB100 × 23%)	70%	0	23	—	13.8	9.2	—
	35%	0	23	—	13.8	9.2	—
Share of after-tax profit LG's share: 70% × (100-23) = 53.9 35% × (100-23) = 26.9	70%	—	53.9	23.1	—	53.9	23.1
	35%	—	26.9	50.1	—	26.9	50.1
<b>Total payoff if the LG firm pays tax (A)</b>	<b>70%</b>	<b>0</b>	<b>76.9</b>	<b>23.1</b>	<b>13.8</b>	<b>63.1</b>	<b>23.1</b>
	<b>35%</b>	<b>0</b>	<b>49.9</b>	<b>50.1</b>	<b>13.8</b>	<b>36.1</b>	<b>50.1</b>
If the LG firm avoids tax:							
Share of tax revenue between CG and LG	70%	0	0	—	0	0	—
	35%	0	0	—	0	0	—
Share of after-tax profit LG's share: 70% × 100 = 70 35% × 100 = 35	70%	—	70	30	—	70	30
	35%	—	35	65	—	35	65
<b>Total payoff if the LG firm avoids tax (B)</b>	<b>70%</b>	<b>0</b>	<b>70</b>	<b>30</b>	<b>0</b>	<b>70</b>	<b>30</b>
	<b>35%</b>	<b>0</b>	<b>35</b>	<b>65</b>	<b>0</b>	<b>35</b>	<b>65</b>
<b>LG's payoff difference due to tax avoidance (B-A)</b>	<b>70%</b>	<b>0</b>	<b>-6.9</b>	<b>6.9</b>	<b>-13.8</b>	<b>6.9</b>	<b>6.9</b>
	<b>35%</b>	<b>0</b>	<b>-14.9</b>	<b>14.9</b>	<b>-13.8</b>	<b>-1.1</b>	<b>14.9</b>

**Note 1:** We can see that: (1) in the pre-2002 period, the LG has a higher payoff if it pays taxes than if it avoids taxes regardless of its ownership; (2) after 2003, when the LG's ownership percentage is higher than the tax sharing ratio, the LG has a higher payoff if it avoids taxes than if it pays taxes; and (3) the outside shareholders' payoffs are not affected by the 2002 reform, but increase when LG firms avoid taxes, suggesting that LG firms' tax avoidance increases both outside shareholders' return on investment and LGs' extra-budgetary revenue.

**Note 2:** We recognize that there may be a secondary effect from LGs' tax avoidance. A potential payoff to LGs from LG firms' tax avoidance is that the tax avoidance may lead to an increase in dividends paid to outside investors, which, in turn, will lead to more dividend tax revenue for governments. According to China's tax regulations, only individual shareholders and investment funds are required to pay tax on dividend income (20 percent before 2005, and 10 percent from 2005 onward), whereas dividends received by corporate investors and social security funds are tax-free. Individual income tax received by LGs also needs to be shared with the central government in the ratio of 40:60, the same as corporate income tax. Moreover, on average, individual shareholders account for less than 10 percent of listed companies' shareholding during our sample period (CSRC 2007). Based on our sample and published statistics, the estimated amount of extra dividend tax revenue received from individual shareholders due to tax avoidance represents only 0.0016 percent of LGs' total annual budgetary revenue and 1.55 percent of the LGs' payoff due to tax avoidance. Given that the resulting individual dividend income tax only minimally increases the payoff to LGs for tax avoidance, we do not explicitly include this secondary effect in Equation (4), which shows that tax avoidance will be beneficial to LGs when LGs' ownership percentage is higher than its tax sharing ratio (i.e.,  $s < a$ ). Considering this secondary effect means that tax avoidance will be beneficial to LGs even if LGs' ownership percentage is equal to or slightly lower than its tax sharing ratio.

## APPENDIX B

### Variable Definitions

Variable	Definition	Source
Tax Avoidance Measures		
<i>METR1</i>	Modified ETR1, calculated as the ratio of ETR1 (income tax expense divided by pre-tax book income) to applicable tax rate (ATR).	Applicable tax rate is hand-collected from financial reports; other data are from CSMAR.
<i>METR2</i>	Modified ETR2, calculated as the ratio of ETR2 (income tax expense divided by net operating cash flows) to applicable tax rate (ATR).	
<i>BTD</i>	Book-tax differences, calculated as pre-tax income multiplied by the applicable tax rate minus income tax expense, scaled by total assets.	
<i>AvgMETR1</i>	The province-year average <i>METR1</i> .	
<i>AvgMETR2</i>	The province-year average <i>METR2</i> .	
Firm-Level Variables		
<i>LG</i>	Dummy variable that equals 1 if a firm's controlling shareholder is a local government agency or local government-controlled enterprise at the provincial, municipal, or county level, and 0 otherwise.	Hand-collected from financial statements; other data are from CSMAR.
<i>NonSOE</i>	Dummy variable that equals 1 if a firm's ultimate controlling shareholder is not a government agency or government-controlled enterprise, and 0 otherwise.	
<i>POST2002</i>	Dummy variable that equals 1 for all firm-years beginning in 2002, and 0 otherwise.	
<i>CFO</i>	Operating cash flows, scaled by total assets.	
<i>FIRSTSH</i>	The shareholding ratio of the largest shareholder.	
<i>LEV</i>	Leverage ratio, calculated as total liabilities divided by total assets.	
<i>ROA</i>	Return on assets, calculated as pre-tax profit divided by total assets.	
<i>SINTS</i>	Intangible assets, scaled by total assets.	
<i>SIZE</i>	Firm size, calculated as the natural logarithm of total assets.	
<i>GROWTH</i>	Percentage change in sales between years.	
$\Delta ATR$	Applicable tax rate in year $t$ minus applicable tax rate in year $t-1$ .	
<i>RIGHTS</i>	Dummy variable that equals 1 if the firm issues a rights offering in the next year, and 0 otherwise.	
<i>AGE</i>	Number of years since the firm was listed.	
<i>MTBV</i>	Market-to-book ratio, measured as market value of equity divided by book value of equity.	
<i>DACC</i>	Discretionary accruals, estimated from the modified Jones model by year and industry.	
<i>LogCASHDPS</i>	Natural logarithm of cash dividend per share.	
<i>HTP</i>	Dummy variable that equals 1 if the <i>METR1</i> of a firm is below the sample mean (i.e., tax-aggressive), and 0 otherwise.	
Province-Level Variables		
<i>RPIT</i>	The ratio of revenue from government-controlled enterprises' profit distribution to revenue from collected corporate income tax sharing.	National Bureau of Statistics of China.
<i>DEFICIT</i>	Total government expenditure divided by total government revenue.	
<i>REBR</i>	The ratio of extra-budgetary revenue (the sum of administrative fees, fines, land sales, and surcharges) to total government revenue.	
<i>GDP</i>	The natural logarithm of gross domestic product per capita (per person).	
<i>SOE_SALE</i>	Total annual sales of SOEs in a region divided by total annual sales of SOEs in the country.	
<i>DFI</i>	The ratio of annual direct foreign investment received by a region to annual direct foreign investment received by the country.	



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