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## Monitoring and Tax Planning – Evidence from State-Owned Enterprises

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Eva Eberhartinger, David M. P. Samuel, David M. P. Samuel





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Eva Eberhartinger  
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Eva Eberhartinger, Erich Kirchler, Michael Lang, Rupert Sausgruber, and Martin Zagler

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Research Papers

# **Monitoring and Tax Planning – Evidence from State-Owned Enterprises**

Eva Eberhartinger\*

WU – Vienna University of Economics and Business  
eva.eberhartinger@wu.ac.at

David M. P. Samuel

University of Wisconsin–Madison  
WU – Vienna University of Economics and Business  
dsamuel@wisc.edu

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# **Monitoring and Tax Planning – Evidence from State-Owned Enterprises**

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## **Abstract**

This study provides new evidence on the association of state ownership and tax planning by showing that a shareholder's monitoring incentives affect a firm's tax planning. Using the unique setting of the German fiscal federalism, where both the federal and local governments levy a significant corporate income tax, we distinguish between state owners that directly benefit from state-owned enterprises' (SOEs') income tax payments and those that do not. Our results indicate that state ownership is associated with less tax planning, but only for SOEs where the state owner directly benefits from higher tax payments. These results are robust to various specifications and suggest that shareholders' monitoring incentives are a determinant of a firm's tax planning activities. Our findings provide timely evidence on the current debate of the potential tax effects stemming from increases in state ownership around the world due to the COVID-19 pandemic.

**Keywords:** tax avoidance, monitoring, ownership structure, state owned enterprises

**JEL classification:** G30, G32, H26, H71

## 1. Introduction

This study investigates the role of state owner incentives in the tax planning activities of a firm. We study the specific incentive structure of state owners, whose returns depend on a firm's dividend payments *and* its tax payments. Studying the role of state ownership in tax planning is important because around 10 percent of the 2,000 largest firms in the world are state owned enterprises (SOEs) (Kowalski et al. 2013). Moreover, the recent COVID-19 pandemic led to increases in state ownership. For example, the government of Italy nationalized the airline Air Italia and the German government became a shareholder of Lufthansa. In 2020, the German government also became a shareholder of Curevac, a pharmaceutical firm working on the development of a COVID-19 vaccination.<sup>1</sup> There are ongoing political discussions about linking governmental equity injections or other forms of support with a decrease in the respective firm's tax planning activities with some countries requiring “good tax behavior” and an absence from tax havens (Tax Justice Network 2020).

Our study adds to this important and timely discussion by shedding light on the association between state ownership and tax planning. Specifically, we investigate the state owner's monitoring incentives, which can vary between SOEs, and the effect of these incentives on the tax planning activities of SOEs. Interestingly, we find that SOEs only engage in less tax planning relative to privately owned firms (i.e., Non-SOEs) if the SOE's state owner benefits from the tax revenues. Therefore, state ownership in itself does not always imply less tax planning. This finding informs the current policy discussions because it suggests that governance mechanisms are

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<sup>1</sup> See the following links for news coverage of these cases: <https://www.reuters.com/article/airlines-italy-alitalia-idUSKBN26V0E4>; <https://www.ft.com/content/e7f87a03-e77f-46cc-933e-95cd50a60640>; and <https://www.dw.com/en/covid-19-vaccine-search-germany-buys-stake-in-curevac/a-53809682>

necessary in SOEs as well to ensure the desired tax behavior. More generally, our findings underline the role of shareholders' incentives in monitoring the tax function.

SOEs are special in that the government acts not only as a tax collector—the “uninvited” shareholder in the Scholes-Wolfson framework (Scholes et al. 2015)—but also as a shareholder. As such, the state owner benefits from the firm's profit in two distinct ways: (1) from the firm's income tax payments and (2) from the firm's after-tax profit distributions, where higher tax payments lead to lower dividend distributions. This poses the question whether SOEs engage in more or less tax planning than private firms—a question on which prior studies have provided ambiguous empirical evidence. On the one hand, state owners can incentivize a lower effective tax rate and increase their after-tax dividend. To pursue that goal, state owners may use their political connections to pressure tax authorities to act more favorably towards SOEs (e.g., Brown et al. 2015, Kim and Zhang 2016, Lin et al. 2018) or to facilitate the access to external financing (Na et al. 2021); or these state owners may use their shareholder rights to incentivize management accordingly. On the other hand, prior findings suggest that SOEs engage in less tax planning relative to Non-SOEs, implying that the incentive to maximize tax revenues dominates (e.g., Bradshaw et al. 2019, Wu et al. 2012).

However, the assumption that a state owner directly benefits from a firm's income tax payments does not always hold. In a decentralized setting, where the federal, state, and/or local government levy income taxes and own enterprises, ownership and generation of tax revenues do not necessarily coincide. In this paper, we exploit this variation and investigate how different types of state owners with different incentives affect the tax planning activities of SOEs. Specifically, our research setting exploits the three governmental levels in Germany: the federal, state, and

local/municipal level.<sup>2</sup> Of the three governmental levels, the federal and local governments (the more than 11,000 municipalities) directly levy and benefit from income taxes while other governmental entities (e.g., the 16 German states) do not levy a corporate income tax. Therefore, this setting allows us to distinguish between two types of state owners: those that benefit from increased tax payments (federal and local state owners; *Benefit* SOEs in Appendix A) and those that do not (non-federal and non-local state owners; *Non-Benefit* SOEs in Appendix A). We predict that SOEs owned by state owners that directly benefit from income tax payments engage in less tax planning than Non-SOEs and SOEs owned by state owners that do not receive income tax payments.

To test this prediction empirically, we retrieve unconsolidated financial data of 43,496 private (i.e., not publicly listed) German firms from Bureau van Dijk's Orbis database. We find a negative association of state ownership and tax planning only for those SOEs with a state owner that directly benefits from the tax revenues. To account for observable differences between SOEs and Non-SOEs, we apply weighting and matching techniques (entropy balancing and propensity score matching) and find very similar results. Moreover, we conduct tests in an SOE-only sample, which addresses concerns about unobservable differences between SOEs and Non-SOEs (e.g., the self-selection of governments to own certain firms). Within this subsample, we confirm that only SOEs with a state owner that benefits from the tax revenues engage in less tax planning.

Moreover, we find that the observed effect is concentrated in municipalities with a relatively low tax rate. This finding suggests that local state owners monitor their SOEs less when the relative tax burden is already high. Higher overall tax revenues thus appear to allow for more leniency towards SOEs. In sum, our results suggest that shareholder monitoring incentives affect

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<sup>2</sup> We use the terms "local government" and "municipality government" interchangeably.

the tax planning activities of firms. Our findings also present a more nuanced view of the relationship between state ownership and tax planning than the literature currently suggests. While prior research interprets lower tax planning in SOEs as an indicator for governmental power over the firm (e.g., Wu et al. 2012), our results imply that state owners, just like any other shareholder, can have different monitoring incentives.

Our results inform policymakers in the current debates on policies targeting the economic turmoil caused by the COVID-19 pandemic. As such, our study suggests that direct participation in tax revenues can be an effective monitoring tool to curb the tax planning activities of SOEs. Therefore, policymakers can use our findings when determining policies for creating an effective tax governance framework for firms that receive state aid through state ownership due to the COVID-19 pandemic. Our results should also be of interest to non-state owners of SOEs because they might face lower returns due to less tax planning activities.

Moreover, the setting of our study is Germany, a market-based economy in which governmental interference is relatively low. In contrast, most prior studies on SOEs' tax planning activities use samples of Chinese firms but note that governmental interference is relatively high in China. This interference translates to preferential tax treatment of SOEs (e.g., Australian Tax and Transfer Pricing Institute 2019, Wu et al. 2012) and relatively weaker governance structures of Chinese firms in general (Bauer et al. 2019). We believe that the German tax regime provides an interesting setting, which also allows to generalize our findings to other market-based economies.

We also add to the findings of prior studies that investigate the association of state ownership and tax avoidance. While some studies find that state owned firms engage in less tax planning (e.g., Bradshaw et al. 2019, Wu et al. 2012, Zeng 2010), other studies (e.g., Brown et al.



2015, Kim and Zhang 2016, Lin et al. 2018) find that politically connected firms experience lower tax enforcement resulting in more tax planning. We add to these ambiguous findings by providing evidence that the *incentives* of state owners are an important determinant for the tax planning activities of SOEs.

Finally, we contribute to the literature on the role of agency conflicts in corporate tax planning (e.g., Hanlon and Heitzman 2010, Wilde and Wilson 2018). Following the agency framework of Desai and Dharmapala (2006), prior studies investigate the relationship between a firm's corporate governance and shareholder structure and its tax planning activities (e.g., Armstrong et al. 2015, Bradshaw et al. 2019, Chen et al. 2010, Cheng et al. 2012, Khan et al. 2017, Khurana and Moser 2013, McGuire et al. 2014). Collectively, the findings of prior studies are consistent with the agency theory of tax planning, which describes a manager's tax planning decision as a function of the manager's incentive structure and the corporate governance of the firm (Desai and Dharmapala 2006, 2009). However, while this stream of research investigates the incentive structure of the manager (the agent), we focus on the monitoring incentives of the shareholder (the principal). In contrast to common perception and prior research (e.g., Wu et al. 2012, Zeng 2010), we find that state owners only act as monitoring shareholders (in terms of the tax function) when they directly benefit from the tax revenues.

## **2. Institutional Background and Hypothesis Development**

### *2.1 Institutional Background: SOEs and the Corporate Tax System in Germany*

The German government is divided into three levels: the federal, the state, and the local/municipal level. While the federal government's involvement in firms often has historic reasons (e.g., the government's role as provider of telecommunication) and has been decreasing since a wave of privatizations over the last decades, municipal state ownership has increased

during the last 15 years (Bundeskartellamt 2014). Historically, municipalities invested in business activities of public interest (e.g., waste management or hospitals) but have broadened their scope of activities over the last years to sectors such as food processing (Bardt and Fuest 2007).

Economists view this development critically because, among other reasons, they fear a competitive advantage of these SOEs over private business activities (Bundeskartellamt 2014). This concern is partly rooted in the potentially favorable tax treatment of SOEs.<sup>3</sup> However, a report by the German Anti-trust Commission mentions higher tax revenues (from the SOEs themselves as well as from positive spillovers) as one reason for the increase of SOE activity over the last years (Monopolkommission 2014). Still, Germany is a market-based economy in which governmental interference is relatively low, which allows to generalize our findings to other market-based economies.<sup>4</sup>

In Germany, the corporate income tax is levied on the federal level at a flat rate of 15.825 percent.<sup>5</sup> Moreover, the more than 11,000 German municipalities levy a local business tax (LBT) and have the authority to determine the LBT rate independently. The rates range from 7 to over 30 percent with an average rate of 14 percent, leading to an average total statutory tax rate of 29.825 percent. Both the federal corporate income tax and the local business tax have a very similar tax base and only differ in terms of the tax rate. The taxable income of firms with several branches across different municipalities is apportioned to the respective municipalities based on wages paid.

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<sup>3</sup> To receive a favorable tax treatment, an SOE in Germany has to be organized as a non-profit firm. Therefore, we exclude non-profit firms from our sample (see Section 3.3 and Appendix C).

<sup>4</sup> In contrast, most prior studies on SOEs' tax planning activities use samples of Chinese firms but note that governmental interference is relatively high in China (e.g., Australian Tax and Transfer Pricing Institute 2019, Bauer et al. 2019, Wu et al. 2012).

<sup>5</sup> The federal corporate income tax rate is 15 percent. Additionally, the federal government levies a 5.5 percent surcharge ("Solidarity Surcharge") on the federal corporate income tax liability, leading to an overall tax rate of 15.825 percent (=15 percent \* 1.055).

However, the number of firms with business activities in more than one municipality is rather low (see, for example, Bethmann 2017).

The 16 states do not levy an income tax but receive a federal re-distribution of income tax revenues, which follows a mechanism based on a state's economic strength (*"Finanzausgleich"* in German). Due to the different levels of taxation, federal and local governments directly benefit from tax payments of their SOEs (*Benefit* SOEs in Appendix A). In contrast, non-federal and non-local governments do not directly benefit (*Non-Benefit* SOEs in Appendix A).<sup>6</sup>

## 2.2 Hypothesis Development: Ownership Structure and Tax Planning

A firm's ownership and governance structure is one of the determinants of corporate tax planning activities (Hanlon and Heitzman 2010). In this line, Desai and Dharmapala (2006) argue that a firm's propensity to engage in tax planning depends on a manager's incentive structure and the firm's overall governance. Firms with strong governance structures facilitate tax planning as shareholders are less concerned with managerial rent extraction connected to tax planning, especially when firms have relatively low levels of tax planning (Armstrong et al. 2015). This insight motivates research on the association of a firm's shareholder structure and its tax planning activities because shareholders have a significant influence on a firm's corporate governance structure (e.g., Wilde and Wilson 2018). Similarly, the presence of majority shareholders shapes a firm's governance structure in various dimensions, especially because minority shareholders may suffer from rent extraction by the majority shareholder (Desai and Dharmapala 2006, 2009). This setting motivates various studies that investigate tax planning activities in the presence of majority

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<sup>6</sup> These non-federal and non-local state owners may benefit indirectly via the federal re-distribution payments. However, this benefit is more uncertain and considerably less in amount.

shareholders (e.g., Chen et al. 2010, Cheng et al. 2012, Khan et al. 2017, Khurana and Moser 2013, McGuire et al. 2014).

A special form of majority ownership is state ownership. Traditionally, SOEs are rare in the U.S. and most empirical studies use samples of firms from China, where the government is a shareholder of a significant portion of firms.<sup>7</sup> Zeng (2010) provides empirical evidence that Chinese SOEs engage in less tax planning relative to Non-SOEs. In contrast, Wu et al. (2012) find that Chinese SOEs that are big in size engage in more tax planning because they have, relative to smaller SOEs, more political power (e.g., through lobbying). This finding goes back to the “political cost view” as big Chinese firms that are not state-owned are more prone to regulatory scrutiny and therefore pay more taxes (Watts and Zimmerman 1986, Zimmerman 1983).

Relatedly, SOEs are politically connected, and prior research suggest that firms use such political connections to change the tax law (or its enforcement) in their favor. Using a sample of U.S. firms, Brown et al. (2015) find that firms that invest in close connections to policymakers through campaign donations have lower future effective tax rates. Similarly, Kim and Zhang (2016) find that politically connected firms are more tax aggressive than non-connected firms. Using data on Chinese firms and tax audits, Lin et al. (2018) provide similar evidence, suggesting that politically connected firms in China benefit from a preferential tax treatment through less strict enforcement. The findings of Na et al. (2021) suggest that political connections enable more tax planning in financially unconstrained firms but decrease tax planning in financially constrained firms, which benefit from lower external financial costs due to their political connections. In sum, prior research provides ambiguous empirical evidence on whether SOEs engage in more or less

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<sup>7</sup> During the 2008 Financial Crisis, the U.S. government increased its involvement in the economy through bailouts (e.g., General Motors or Citigroup). This government involvement has started discussion about state ownership also in the U.S. (see, for example, Kahan and Rock 2011).

tax planning than Non-SOEs (or than firms with fewer political connections). Therefore, we pose the following non-directional hypothesis in the alternative form:

***H1: SOEs exhibit a different level of tax planning relative to Non-SOEs.***

However, the studies discussed above do not address differences within state ownership (i.e., between different types of state ownership). Addressing this gap, Bradshaw et al. (2019) find that SOEs report higher ETRs than Non-SOEs but this effect is only present in certain SOEs where the managers have career interests that are connected to the SOE's tax behavior.<sup>8</sup> Specifically, the authors provide evidence that tax planning is lower in SOEs where the promotions of managers are contingent on government evaluations. In SOEs where the government influences these evaluations more strongly, managers aim to "please the government" by paying more taxes.

We add to the prior literature by focusing on the different incentive structures that different state owners can have. Specifically, only state owners directly benefiting from the tax payments (*Benefit* SOEs in Appendix A) have incentives to monitor their firms and demand less tax planning. Vice-versa, state owners not benefiting from tax payments (*Non-Benefit* SOEs in Appendix A) may incentivize more tax planning to receive higher after-tax dividend income.

Appendix A provides an example. Suppose a tax rate of 30%, an ownership of 60%, and a pre-tax profit of \$100. In this case, the state owner of a *Benefit* SOE receives \$72 in total (i.e., \$42 after-tax profit plus \$30 taxes). In contrast, the state owner of a *Non-Benefit* SOE only receives the \$42 after-tax profit, which is the same amount a "normal" (i.e., non-state) shareholder of a privately-owned firm receives (*Non-SOE* in Appendix A). Now suppose that tax planning can decrease the effective tax rate to 10%. In this case, the non-state owner of a Non-SOE or the state owner *Non-Benefit* SOE would increase the return from \$42 to \$54 (=60% of the \$90 after-tax

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<sup>8</sup> Prior research suggests that also in Non-SOEs, managers' career concerns affect their decision to engage in tax planning (e.g., Chyz and Gaertner 2017, Li et al. 2021).

profit). However, the return of the state owner of the *Benefit* SOE would decrease from \$72 to \$64 (=60% of the \$90 after-tax profit + \$10 tax revenue).<sup>9</sup> Accordingly, we predict that SOEs owned by state owners with a direct claim on the tax revenues engage in less tax planning. Formally, we state the following hypothesis in the alternative form:

**H2:** *Relative to Non-SOEs and to SOEs with state owners that do not directly benefit from tax revenues, SOEs with state owners that directly benefit from tax revenues engage in less tax planning.*

### 3. Research Design and Sample Selection

#### 3.1 Measures of Tax Planning

In Germany, a firm's overall corporate statutory tax rate includes the federal corporate income tax rate of 15.825 percent and the local business tax rate (LBT), which differs across municipalities. In our sample, the median and mean LBT rate are 14 percent. Apart from the LBT rate differentials, there are no tax regime differences between the municipalities. That is, the LBT base is the same independent of a firm's location, but rates vary depending on the municipality a firm is headquartered in. To gauge tax planning in this setting, we refer to prior research and adapt two measures. First, we define a firm's effective tax rate (ETR) as:

$$ETR_{i,t} = \frac{Taxes_{i,t}}{PTI_{i,t}} \quad (1)$$

where  $Taxes_{i,t}$  is total tax expense and  $PTI_{i,t}$  is pre-tax income (both for firm  $i$  in year  $t$ ).

Following prior studies, a lower ETR indicates more tax planning (e.g., Chen et al. 2010).

Due to the LBT rate variation between municipalities, the ETR does not capture statutory differences in tax rates. Therefore, as a second measure, we adapt the tax planning measure

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<sup>9</sup> If the state owner of a *Benefit* SOE has a 100% ownership in the SOE, the state owner would be indifferent between receiving the profit through a dividend or a tax payment because the state owner would always receive 100% of the profit. However, the tax payment is still a preferred claim because there might be reasons a dividend cannot be paid (e.g., cash constraints or legal requirements).

developed by Atwood et al. (2012). This measure is mostly used to control for between-country differences in statutory tax rates as the measure relates a firm's ETR to the respective jurisdiction's statutory tax rate (e.g., De Simone, Stomberg, et al. 2019). In our setting, there are different *within*-country jurisdictions, namely the different municipalities. Thus, we define *TaxAvoid* as:

$$TaxAvoid_{i,t} = \frac{PTI_{i,t} * \tau_{m,t} - Taxes_{i,t}}{PTI_{i,t}} = \tau_{m,t} - ETR_{i,t} \quad (2)$$

where  $Taxes_{i,t}$  and  $PTI_{i,t}$  are defined as in Equation (1) and  $\tau_{m,t}$  is the total statutory tax rate (i.e., federal corporate tax rate plus the respective LBT rate) in municipality  $m$  in year  $t$ . The interpretation of this measure is mirroring that of the ETR: higher *TaxAvoid* indicates higher tax planning. By definition, *TaxAvoid* is highly correlated with *ETR*, but still provides additional information as it directly controls for different statutory tax rates between municipalities.<sup>10</sup>

### 3.2 Research Design

To test our prediction, we follow Chen et al. (2010) and estimate the following model using OLS:

$$\begin{cases} ETR_{i,t} \\ TaxAvoid_{i,t} \end{cases} = \alpha_j + \alpha_s + \alpha_t + \beta_1 SOE_{i,t} + \sum \beta_k Controls_{i,t}^k + \varepsilon_{i,t} \quad (3)$$

where  $i$  and  $t$  denote firms and years, respectively. *ETR* (see Equation (1)) is the effective tax rate and *TaxAvoid* (see Equation (2)) the tax avoidance measure developed by Atwood et al. (2012). We follow prior research (Bradshaw et al. 2019) and define *SOE* as an indicator variable equal to one if a governmental entity is the majority shareholder of a firm, and zero otherwise. Therefore,  $\beta_1$  is our coefficient of interest. For the full sample tests of all SOEs, we do not predict a direction

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<sup>10</sup> For both *ETR* and *TaxAvoid*, we use the total tax expense rather than the current tax expense due to data restrictions (for a discussion, see, for example, Dyreng et al. 2008). Similarly, we cannot extend this measure by a cash component to calculate the cash effective tax rate as the Orbis database (and the financial reporting environment) does not provide information on actual cash effective tax payments.

for  $\beta_1$ , following H1 and the ambiguous theoretical prediction and mixed evidence from prior research (e.g., Wu et al. 2012, Zeng 2010).

H2 poses that federal- and local-owned SOEs (*Benefit* SOE in Appendix A), where the state owner directly benefits from the firm's income tax payments, should engage in less tax planning relative to Non-SOEs and to SOEs where the state owner does not benefit from the tax payments (*Non-SOEs* and *Non-Benefit* SOEs in Appendix A). Therefore, we separately estimate Equation (3) for a sample with the two types of state owners; both times we include Non-SOEs as benchmark. Following our hypothesis H2, we predict  $\beta_1$  to be positive (negative) with *ETR* (with *TaxAvoid*) as dependent variable only when we include the SOE sample where the state owner benefits from the income tax payments.

To account for time-invariant industry fixed effects, we include industry indicators ( $\alpha_j$ ) at the NACE two-digit level. Moreover, we add indicators for the 16 states in Germany to account for time-invariant state characteristics. We control for macroeconomic trends by including year indicators ( $\alpha_t$ ). The vector *Controls* includes control variables similar to those used in Chen et al. (2010). Specifically, we include *RoA* to control for differences in profitability as profitable firms might face different tax planning incentives (e.g., Graham et al. 2014). Similarly, prior research (e.g., Zimmerman 1983) provides evidence that firm size is related to tax planning, which is why we include *Size* (defined as the natural logarithm of total assets in year  $t-1$ ) as control variable. As firms can carry forward losses and deduct interest payments from their tax base, we control for these deductions by including the variables *LossFirm* and *Leverage*, respectively. *LossFirm* is a dummy that equals one if the firm has a loss in more than half of the years in our sample period.<sup>11</sup>

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<sup>11</sup> Our data do not contain a variable similar to net operating loss (*NOL*) in Compustat.



Moreover, we control for a firm's assets composition as the proportion of tangible and intangible assets potentially affects a firm's tax planning (e.g., De Simone, Mills, et al. 2019). Therefore, we include *Tangibility* and *Intangible* as control variables, measured as tangible assets over lagged total assets and intangible assets over lagged total assets, respectively. Finally, we include lagged sales growth (*SalesGrowth*) to capture growth opportunities as growth (and investment) can affect a firm's access to special tax deductions (e.g., Armstrong et al. 2012). We use sales growth to approximate growth opportunities as our sample includes non-listed firms only, and market-to-book ratios are not available. Appendix B provides an overview of all variable definitions.

### 3.3 Sample Selection and Descriptive Statistics

We collect data on unconsolidated financial statements and the ownership structure of German firms from Bureau van Dijk's Orbis database, for the period 2008-2015. We exclude financial (NACE 6400 to 6899) and utility (NACE 3500 to 3999) firms as both fall under specific regulations (e.g., Badertscher et al. 2013). Moreover, we drop observations from industries (NACE two digit) that do not include SOEs and thus do not allow for within-industry analyses. We drop observations of non-profit firms as these are likely tax-exempt. We also drop observations with missing values for our dependent or independent variables.<sup>12</sup> We also require that Non-SOEs have a majority shareholder to ensure that Non-SOEs are comparable to SOEs, which by our definition have a state owner as majority shareholder. Dropping Non-SOEs without a majority shareholder does not reduce our sample significantly (see Appendix C) as most of the private firms in our sample have a majority shareholder. Finally, we check the data for outliers and drop observations

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<sup>12</sup> As we find enormous outliers for *SalesGrowth*, we follow prior studies using Bureau van Dijk data (e.g., Engel and Middendorf 2009) and exclude observations with values of *SalesGrowth* higher (lower) than 300% (-300%).

with values of our dependent and some independent variables (i.e., those with significant outliers) that are outside of the 1 and 99 percentile. Our final sample includes 109,253 firm-year observations. Appendix C summarizes our sample selection.

Table 1 provides descriptive statistics of our full sample as well as various subsamples. In the full sample (Panel A), the average ETR equals 26.68 percent while the sample's average statutory tax rate is 29.79 percent; this difference is reflected in the mean value of *TaxAvoid* (0.031). The mean value of *SOE* implies that 1.71 percent of firm-years are observation with state ownership. In absolute numbers, this translates to 1,869 out of 109,253 firm-years (575 out of 43,496 unique firms). In Panel B and C of Table 1, we provide descriptive statistics on the subsample of SOEs. Out of 1,869 total SOE firm-years, SOEs with a state owner that directly benefits from the tax revenues account for 1,002 firm-years (302 out of 575 unique firms).<sup>13</sup> The remaining SOEs are Non-Benefit SOEs and account for 867 firm-years (273 out of 575 unique firms).

## 4. Results

### 4.1 Full sample tests

Table 2 presents the regressions results from Equation (3). In the full sample test with *ETR* as dependent variable (Column 1), the coefficient on *SOE* ( $\beta_1$ ) is close to zero and not statistically significant. Similarly, the coefficient on *SOE* in the specification with *TaxAvoid* as dependent variable (Column 4) is close to zero and not statistically significant. Most of the coefficients of the control variables are statistically significant (also in joint tests) and support our choice to include them in the estimation. Based on this initial result, we fail to find support for H1 as there is no significant difference in tax planning activities between SOEs and Non-SOEs. However, to further

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<sup>13</sup> The majority (288 firms) of these 302 firms has a local state owner while 14 firms are owned by the federal government.

account for observable differences between SOEs and Non-SOEs, we apply two weighting and matching techniques, namely entropy balancing and propensity score matching (PSM).<sup>14</sup>

First, we follow Hainmueller (2012) and balance the observations of the treatment (SOEs) and control (Non-SOEs) group using all three moments of the distribution of the control variables from Equation (3). Table 3 provides the mean, variance, and skewness of the covariate distribution before (Panel A) and after (Panel B) entropy balancing for SOEs and Non-SOEs, respectively. While the differences in the means of the covariates are statistically significant for all covariates *before* balancing, no covariate mean is statistically significant *after* balancing. Therefore, by using entropy balancing, we can further mitigate concerns that observable differences between SOEs and Non-SOEs affect our results. Moreover, entropy balancing reduces model dependency (Hainmueller 2012). Table 4 presents the results of estimating Equation (3) using the entropy-balanced sample. For the specification with *ETR* as dependent variable, the coefficient on *SOE* is positive, suggesting less tax planning by SOEs, but statistically not significant (p-value: 0.126; Column 1). The coefficient on *SOE* is negative and statistically significant (p-value: 0.093; Column 4) when we use *TaxAvoid* as dependent variable, suggesting less tax planning by SOEs. Therefore, based on the balanced sample test, we do find some evidence that SOEs engage in less tax planning relative to Non-SOEs.

Second, we follow Shipman et al. (2017) and apply PSM using a logit estimation. By using PSM, we address concerns that observable differences in the control (Non-SOEs) and treatment group (SOEs) and functional form misspecification affect our results. We use a one-to-one matching with replacement that assigns each observation in the treatment group (SOEs) the closest match in the control group (Non-SOEs) in terms of the observable control variables (i.e., the

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<sup>14</sup> We use both entropy balancing and PSM to strengthen the validity of our empirical tests. Specifically, using both techniques addresses concerns about the effect of PSM design choices (DeFond et al. 2017).

control variables from Equation (3)). We present descriptive statistics of the matched sample in Table 5. As we allow for replacement in the matching, the sample size of the control sample (1,668 observations) is slightly smaller than the treatment sample (1,869 observations), indicating that some control observations are used more than once in the estimation.<sup>15</sup> Importantly, while there are statistically significant differences in the covariate means of SOEs and Non-SOEs *before* matching (Panel A of Table 3), only the mean for *RoA* is statistically different *after* matching (Panel C of Table 5).

We present the estimation results of the matched sample in Table 6 and find that the coefficient on *SOE* is statistically significant for both dependent variables (Columns 1 and 4). The positive (negative) sign for *ETR (TaxAvoid)* implies that SOEs engage in less tax planning relative to Non-SOEs. In sum, we interpret the null results from the OLS and from one of the entropy balancing estimations and the significant results from the PSM estimation as evidence for the theoretical ambiguous prediction on the association of state ownership and tax planning. Therefore, our findings reflect the inconsistent findings from prior studies (e.g., Lin et al. 2018, Zeng 2010).

#### 4.2 State Owner Incentives

Hypothesis H2 poses that differences in state owners' incentives affect tax planning activities of SOEs. Therefore, we split our sample of SOEs based on the type of state owner: federal and municipal owners that directly benefit from the tax income (*Benefit* SOEs in Appendix A) versus state owners that do not benefit (*Non-Benefit* SOEs). We predict that SOEs with shareholders that directly benefit from the tax revenues engage less in tax planning.

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<sup>15</sup> The estimation sample contains 3,735 observations (see Column 1 of Table 6). We drop three observations because they are singleton groups within our fixed effects cells (deHaan 2021).

We estimate Equation (3) for both of those groups separately (both times with Non-SOEs as control group). We present the results of this test in Columns 2 and 3 (Columns 5 and 6) of Table 2 using *ETR (TaxAvoid)* as dependent variable. In Column 2 (Column 5), we find that the coefficient on *SOE* is positive (negative) and statistically significant only for the SOEs with directly benefitting state owners, implying less tax planning. In economic terms, SOEs with directly benefitting state owners have, on average, a 2.1 percentage point or 7.9 percent (relative to the sample mean) higher ETR than Non-SOEs.<sup>16</sup> Results are similar when we use the alternative measurement of tax avoidance (*TaxAvoid*, Column 5) following Atwood et al. (2012), which captures the deviation of the ETR from the statutory tax rate in a given municipality. We can therefore rule out that SOEs with a state-owner that directly benefits from tax payments are systematically located in municipalities with higher LBT rates and thus have higher ETRs. Collectively, the results provide evidence that only SOEs with a directly benefitting shareholder engage in less tax planning.

We corroborate the findings from these baseline tests by using entropy balancing and PSM. Table 4 and Table 6 present the results and strengthen our initial interpretation as the coefficients on *SOE* (Columns 2 and 5) remain statistically significant. In fact, the coefficients on *SOE* increase in their statistical significance and economic magnitude relative to the OLS estimation in Table 2. This finding indicates that our results are robust to observable differences between SOEs and Non-SOEs and to a potential functional form misspecification in our OLS estimations. Collectively, the results provide evidence in line with H2 as they suggest that SOEs with directly benefitting state owners (*Benefit* SOEs) engage in less tax planning. To further investigate the role of state owners' incentives, we next focus on tests within the subsample of SOEs.

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<sup>16</sup> For this calculation, we divide the coefficient of 0.021 (Table 2, Column 2) by the mean ETR of the full sample (Table 1, Panel A):  $0.021/0.2668 = 0.079$ .

### 4.3 Further Tests Using the SOE-only Sample

To address concerns about inherent and unobservable differences between SOEs and Non-SOEs, we investigate the subsample of the 575 SOE firms (1,869 firm-years, see Panel B/C of Table 1). Within this subsample, we can hold potential confounding factors, such as the selection choice of governments to own certain firms, constant. We predict that SOEs with directly benefitting state owners (*Benefit* SOE in Appendix A) engage in less tax planning relative to those SOEs where the state owner does not directly benefit from tax payments (*Non-Benefit* SOE). We test this prediction by replacing the *SOE* dummy in Equation (3) with the dummy variable *Benefit* that is equal to one for SOEs with directly benefitting state owners, and zero otherwise.<sup>17</sup>

Again, we separately include state ( $\alpha_s$ ), industry ( $\alpha_j$ ), and year ( $\alpha_t$ ) fixed effects.<sup>18</sup> The vector *Controls* includes the same control variables as in Equation (3). Formally, we estimate the following model using OLS:

$$\begin{cases} ETR_{i,t} \\ TaxAvoid_{i,t} \end{cases} = \alpha_j + \alpha_s + \alpha_t + \beta_1 Benefit_{i,t} + \sum \beta_k Controls_{i,t}^k + \varepsilon_{i,t} \quad (4)$$

We present the results in Table 7 and find that the coefficient on *Benefit* is positive and statistically significant. The coefficient estimate in Column 1 implies a 4.3 percentage point higher ETR for SOEs whose state owner directly benefits from tax revenues, relative to SOEs whose state owner does not. The results are similar when we use *TaxAvoid* as dependent variable (Column 4). Overall, this result corroborates our previous findings as it suggests that the type of state owner affects the tax planning activities of an SOE.

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<sup>17</sup> Specifically, the dummy variable *Benefit* equals one if an SOE's shareholder is the federal or a local government, and zero otherwise.

<sup>18</sup> In this specification, we use industry fixed effects based on the NACE *one* digit classification to ensure sufficient variation within the respective cells.

Moreover, we use the tax rate variation between German municipalities to extend our predictions and tests. While the results of the previous tests imply that municipal governments have an incentive to maximize tax revenues, they also need to maintain a competitive business environment with respect to other municipalities. Therefore, municipal governments face incentives to set attractive LBT rates while maintaining sufficient tax revenues (e.g., Buettner 2003, Foremny and Riedel 2014). As municipalities with higher LBT rates already collect higher absolute tax revenues given the same tax base, SOEs in high-tax municipalities (i.e., municipalities with above-median LBT rates) might experience less pressure by the local state owners. In other words, local owners may be more lenient in enforcing tax compliance when the LBT rate is already high.

To test this prediction, we repeat the previous test but split the sample along the median LBT rate of 14 percent.<sup>19</sup> We present the results in Columns 2/3 and 5/6 of Table 7 and find that the positive association between *Benefit* and *ETR* is concentrated among SOEs with a local state owner in a low-tax municipality (Column 2). In terms of the magnitude, the positive coefficient on *Benefit* in Column 2 implies a 4.8 percentage point higher ETR for *Benefit* SOEs relative to *Non-Benefit* SOEs. The results are similar when we use *TaxAvoid* as dependent variable (Column 5).

We interpret this additional finding as evidence for the overall mechanism through which local state owners affect SOEs. That is, state owners affect SOEs' tax planning when the state owner directly participates in the tax revenues. However, state owners seem to do that in a way that does not burden the SOE taxpayer too heavily. A related interpretation is that municipalities

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<sup>19</sup> In these sample splits, the dummy variable *Benefit* is set to one only for *local* state owners (i.e., *Benefit* is not one for SOEs owned by the *federal* government) because only local state owners benefit from the LBT revenues. As outlined in Section 3.3, the majority of *Benefit*-SOEs has a local state owner.

with lower LBT rates have, on average, a lower GDP per capita (Bethmann 2017). Therefore, municipalities with lower LBT rates (Column 2 and 5 of Table 7) need to raise more tax revenues, which they can do by ensuring lower tax planning activity by their SOEs.

## **5. Conclusion**

In this study, we present empirical evidence for the effect of shareholder-specific monitoring incentives on a firm's tax planning activities. Using the unique setting in Germany, which provides variation in the degree to which a state owner benefits from an SOE's tax payments, we show that the incentives of a state owner are an important determinant of SOEs' tax planning activities. Specifically, we find that only state owners that benefit from the tax revenues (i.e., the federal and municipal governments) engage in less tax planning. Our results are robust to various specifications and subsample tests.

Addressing the current discussion on tax planning activities of firms that might become (or already have become) state owned as consequence of the COVID-19 pandemic (Tax Justice Network 2020), our findings inform policymakers on the tax consequences of state ownership. We find that to ensure lower tax planning in an SOE, the state owner should have a claim on the tax revenues. In federal tax systems this may not necessarily be the case. Ensuring low tax planning activity of SOEs—which may reflect the political preference to position SOEs as good (tax) citizens—would then require formal or informal agreements among all state owners to monitor SOEs accordingly. As our study is set in a developed market economy with generally low governmental interferences, we believe that our findings are generalizable and of interest to policymakers in many countries around the world.

We also provide new insights on the ambiguous findings in prior studies on the role of state ownership and corporate tax planning activities (e.g., Bradshaw et al. 2019, Lin et al. 2018, Wu et



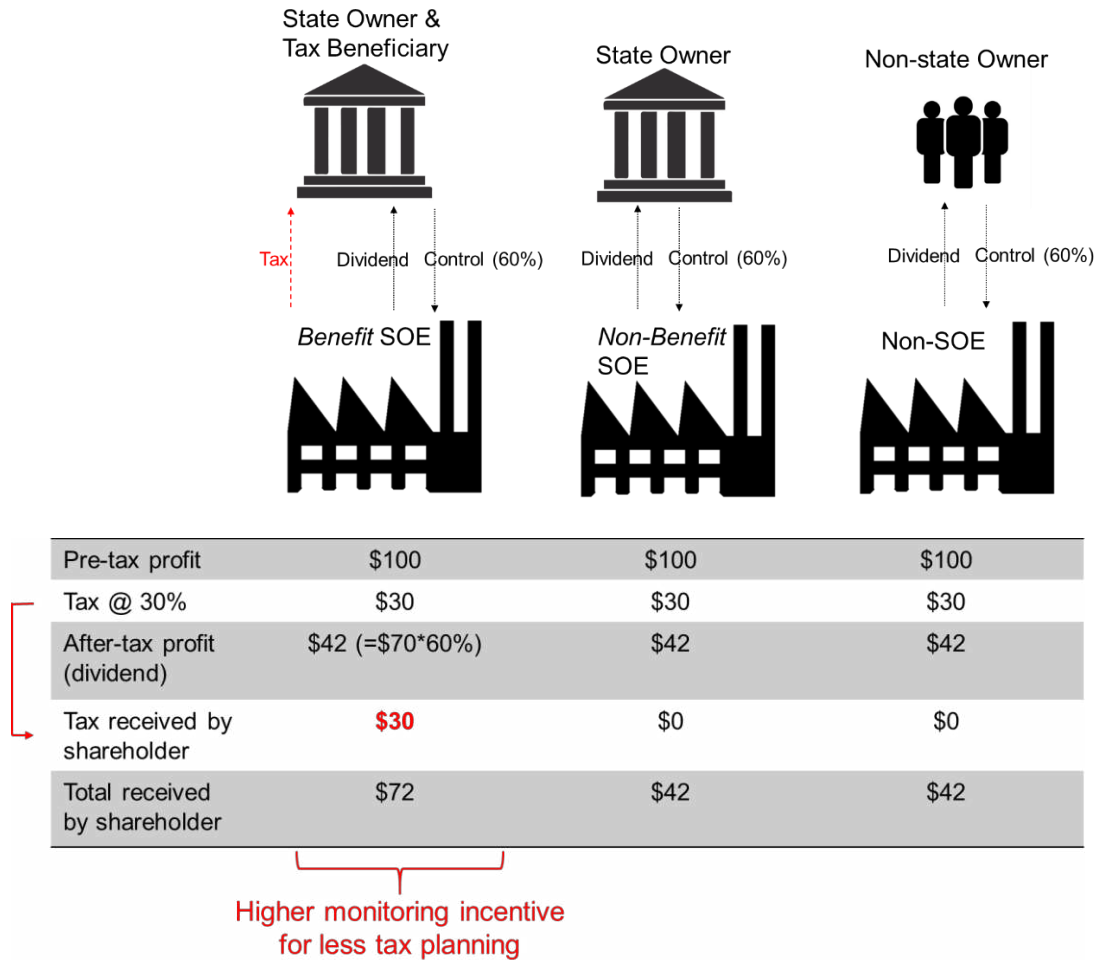
al. 2012). More generally, we show that shareholder incentives are a determinant of tax planning activities. Therefore, we also contribute to the literature on the role of agency conflicts in corporate tax planning (Desai and Dharmapala 2006, 2009, Hanlon and Heitzman 2010, Wilde and Wilson 2018). While prior research investigates the incentive structure of the manager (the agent), we focus on the monitoring incentives of the shareholder (the principal) and provide evidence that these incentives affect the tax planning behavior of a firm.

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## APPENDIX A: ILLUSTRATION OF THE RESEARCH SETTING



**Note:** This appendix illustrates our research setting. In Germany, federal and local state owners directly benefit from the tax payment of their SOEs (*Benefit SOE*). In contrast, other state owners (e.g., the 16 states) do not directly benefit (*Non-Benefit SOE*). Therefore, the state owners of *Non-Benefit SOEs* only receive the after-tax dividend, which is the same amount a “normal” (i.e., non-state) shareholder of a privately-owned firm receives.

## APPENDIX B: VARIABLE DEFINITIONS

<i>Variable</i>	<i>Definition</i>
<b>Dependent variables</b>	
<i>ETR</i>	Effective Tax Rate, defined as tax expense (incl. deferrals) over pre-tax income. <i>ETR</i> is set to missing when pre-tax income is equal to or below zero and is truncated to [0, 1].
<i>TaxAvoid</i>	Statutory tax rate (federal corporate tax rate in year $t$ and local business tax in municipality $m$ in year $t$ ) minus <i>ETR</i> of firm $i$ in year $t$
<b>Independent main variables</b>	
<i>Benefit</i>	Dummy that is equal to one if an SOE's shareholder directly benefits from the SOE's tax revenues
<i>SOE</i>	State-owned Enterprise (SOE) dummy that is equal to one if a firm has a government entity as majority owner
<b>Control variables</b>	
<i>Intangible</i>	Intangible assets scaled by lagged total assets
<i>Leverage</i>	Long-term (i.e., non-current) liabilities scaled by lagged total assets
<i>Lossfirm</i>	Dummy that is equal to one if a firm reports a loss in more than half of the available firm-years
<i>RoA</i>	Return on Assets, defined as operating income over lagged total assets
<i>SalesGrowth</i>	Change in sales relative to prior year's sales
<i>Size</i>	Natural logarithm of total assets
<i>Tangibility</i>	Fixed assets scaled by lagged total assets

## APPENDIX C: SAMPLE SELECTION

Sample Selection	Observations (firm-years)
Firms headquartered in Germany (from Orbis) after dropping: obs. w/ no or limited financial information, financials (NACE 6400 to 6899), utilities (NACE 3500 to 3999), and consolidated accounts	504,048
After merging shareholder information (from Orbis)	481,071
After dropping obs. in industries (NACE 2-digit) that do not include SOEs	415,776
After dropping non-profit firms	407,088
After dropping obs. w/ missing values for <i>ETR</i> , <i>Leverage</i> , <i>Tangibility</i> , <i>Size</i> , <i>Intangibles</i> , <i>SalesGrowth</i> , or <i>RoA</i> ; or obs. w/ values above (below) 300% (-300%) for <i>SalesGrowth</i>	124,398
After dropping firms without a majority shareholder	116,652
After dropping obs. w/ values outside of the 1-99 percentiles of observations of <i>ETR</i> , <i>Tangibility</i> , <i>Leverage</i> , or <i>RoA</i>	109,253
<b>Final sample</b>	<b>109,253</b>

## TABLES

**Table 1: Descriptive Statistics**

<i>Variables</i>	<b>N</b>	<b>Mean</b>	<b>S.D.</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>
<b>Panel A: Full Sample</b>						
<i>ETR</i>	109,253	0.2668	0.1743	0.1406	0.2941	0.3386
<i>TaxAvoid</i>	109,253	0.0311	0.1747	-0.0388	-0.0016	0.1571
<i>SOE</i>	109,253	0.0171	0.1297	0	0	0
<i>RoA</i>	109,253	0.1428	0.1418	0.0500	0.0977	0.1851
<i>Tangibility</i>	109,253	0.2774	0.2548	0.0707	0.1927	0.4242
<i>Size</i>	109,253	8.2481	1.9795	6.7382	8.1884	9.6668
<i>SalesGrowth</i>	109,253	0.1107	0.3547	-0.0396	0.0486	0.1779
<i>Leverage</i>	109,253	0.3172	0.2787	0.1098	0.2360	0.4412
<i>Intangible</i>	109,253	0.0170	0.0592	0.0000	0.0011	0.0079
<i>Lossfirm</i>	109,253	0.0868	0.2816	0.0000	0.0000	0.0000
<b>Panel B: Benefit SOEs only</b>						
<i>ETR</i>	1,002	0.2508	0.2296	0.0485	0.2083	0.3750
<i>TaxAvoid</i>	1,002	0.0503	0.2314	-0.0778	0.0937	0.2537
<i>RoA</i>	1,002	0.0443	0.0644	0.0137	0.0278	0.0540
<i>Tangibility</i>	1,002	0.6459	0.2739	0.5082	0.7197	0.8440
<i>Size</i>	1,002	10.1673	1.9672	9.0267	10.4300	11.5397
<i>SalesGrowth</i>	1,002	0.0523	0.2603	-0.0097	0.0320	0.0763
<i>Leverage</i>	1,002	0.3565	0.2279	0.1751	0.3317	0.5112
<i>Intangible</i>	1,002	0.0182	0.0454	0.0002	0.0028	0.0156
<i>Lossfirm</i>	1,002	0.1637	0.3702	0.0000	0.0000	0.0000
<b>Panel C: Non-Benefit SOEs only</b>						
<i>ETR</i>	867	0.2049*	0.2474	0.0154	0.1011	0.3190
<i>TaxAvoid</i>	867	0.0894*	0.2456	-0.0245	0.1936	0.2738
<i>RoA</i>	867	0.0499	0.0875	0.0108	0.0251	0.0544
<i>Tangibility</i>	867	0.5876*	0.2984	0.3600	0.6954	0.8123
<i>Size</i>	867	10.1550	1.9280	9.0429	10.4810	11.3477
<i>SalesGrowth</i>	867	0.0644	0.2395	0.0092	0.0410	0.0780
<i>Leverage</i>	867	0.2526*	0.2164	0.0866	0.1993	0.3438
<i>Intangible</i>	867	0.0271*	0.0618	0.0012	0.0049	0.0267
<i>Lossfirm</i>	867	0.2215*	0.4155	0.0000	0.0000	0.0000

**Note:** This table presents descriptive statistics. Panel A presents information for the full sample. Panel B (Panel C) displays information on the subsample of firm-years with state ownership where the state owner does (does not) directly benefit from the tax revenues. In Panel C, \* denotes significant differences relative to Panel B at the 1% level (two-tailed).

**Table 2: OLS Regression**

Variables	Dependent Variable: <i>ETR</i>			Dependent Variable: <i>TaxAvoid</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs
<b><i>SOE</i></b>	<b>0.003</b> (0.29)	<b>0.021*</b> (1.77)	<b>-0.018</b> (-1.21)	<b>-0.003</b> (-0.31)	<b>-0.020*</b> (-1.65)	<b>0.016</b> (1.07)
<i>RoA</i>	-0.162*** (-29.09)	-0.162*** (-29.19)	-0.162*** (-29.08)	0.164*** (29.59)	0.164*** (29.71)	0.164*** (29.58)
<i>Tangibility</i>	-0.010*** (-2.62)	-0.010*** (-2.61)	-0.011*** (-2.81)	0.006 (1.64)	0.006 (1.61)	0.007* (1.84)
<i>Size</i>	-0.002*** (-3.03)	-0.002*** (-3.21)	-0.001*** (-2.83)	0.002*** (4.07)	0.002*** (4.22)	0.002*** (3.84)
<i>SalesGrowth</i>	-0.006*** (-3.93)	-0.006*** (-3.90)	-0.006*** (-3.92)	0.006*** (3.88)	0.006*** (3.84)	0.006*** (3.87)
<i>Leverage</i>	-0.010*** (-3.81)	-0.011*** (-4.20)	-0.011*** (-4.02)	0.011*** (3.86)	0.011*** (4.25)	0.011*** (4.06)
<i>Intangible</i>	-0.055*** (-3.77)	-0.051*** (-3.55)	-0.055*** (-3.79)	0.062*** (4.31)	0.059*** (4.08)	0.062*** (4.31)
<i>LossFirm</i>	-0.058*** (-22.98)	-0.059*** (-23.70)	-0.058*** (-22.92)	0.058*** (23.19)	0.060*** (23.92)	0.058*** (23.11)
Observations	109,253	108,386	108,251	109,253	108,386	108,251
Adjusted R <sup>2</sup>	0.085	0.084	0.086	0.088	0.087	0.088
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

**Note:** This table presents regression results for tests of the association between state ownership and tax planning (Equation (3)) estimated using OLS. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix B. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).



**Table 3: Entropy Balancing Statistics**

<i>Variables</i>	<b>Mean</b>	<b>Variance</b>	<b>Skewness</b>	<b>Mean</b>	<b>Variance</b>	<b>Skewness</b>
<b>Panel A: Full Sample before Entropy Balancing</b>						
	<b>SOEs</b>			<b>Non-SOEs</b>		
<i>RoA</i>	0.0469	0.0058	4.7920	0.1444*	0.0202	2.1530
<i>Tangibility</i>	0.6188	0.0823	-0.7817	0.2714*	0.0626	1.0730
<i>Size</i>	10.1600	3.7970	-0.6203	8.2150*	3.8560	0.2262
<i>SalesGrowth</i>	0.0579	0.0629	4.2860	0.1116*	0.1268	2.7790
<i>Leverage</i>	0.3083	0.0522	0.9956	0.3174	0.0781	1.5590
<i>Intangible</i>	0.0224	0.0029	4.9080	0.0169*	0.0035	7.2690
<i>Lossfirm</i>	0.1905	0.1543	1.5760	0.0850*	0.0778	2.9750
<b>Panel B: Full Sample after Entropy Balancing</b>						
	<b>SOEs</b>			<b>Non-SOEs</b>		
<i>RoA</i>	0.0469	0.0058	4.7920	0.0469	0.0058	4.7960
<i>Tangibility</i>	0.6188	0.0823	-0.7817	0.6188	0.0823	-0.7815
<i>Size</i>	10.1600	3.7970	-0.6203	10.1600	3.7960	-0.6117
<i>SalesGrowth</i>	0.0579	0.0629	4.2860	0.0579	0.0630	4.2840
<i>Leverage</i>	0.3083	0.0522	0.9956	0.3082	0.0522	0.9982
<i>Intangible</i>	0.0224	0.0029	4.9080	0.0223	0.0029	4.9060
<i>Lossfirm</i>	0.1905	0.1543	1.5760	0.1907	0.1544	1.5740

**Note:** This table presents descriptive statistics before (Panel A) and after (Panel B) entropy balancing. We present descriptive statistics on the mean, variance, and skewness of each balancing covariate for SOEs (Non-SOEs) in the first (last) three columns. \* denotes significant mean differences between SOEs and Non-SOEs at the 1% level (two-tailed).

**Table 4: Regression with Entropy Balancing**

Variables	Dependent Variable: <i>ETR</i>			Dependent Variable: <i>TaxAvoid</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs
<b><i>SOE</i></b>	<b>0.015</b> (1.53)	<b>0.032***</b> (2.69)	<b>-0.009</b> (-0.72)	<b>-0.016*</b> (-1.68)	<b>-0.032***</b> (-2.63)	<b>0.006</b> (0.47)
<i>RoA</i>	-0.227*** (-3.57)	-0.213*** (-5.61)	-0.230*** (-3.46)	0.227*** (3.62)	0.217*** (6.06)	0.228*** (3.40)
<i>Tangibility</i>	-0.023 (-1.14)	-0.025 (-1.57)	-0.036* (-1.91)	0.016 (0.82)	0.019 (1.20)	0.032* (1.68)
<i>Size</i>	-0.006* (-1.91)	-0.008*** (-3.07)	-0.003 (-0.97)	0.008** (2.44)	0.010*** (3.61)	0.004 (1.41)
<i>SalesGrowth</i>	-0.005 (-0.52)	-0.005 (-0.53)	-0.004 (-0.39)	0.006 (0.57)	0.004 (0.49)	0.005 (0.47)
<i>Leverage</i>	0.096*** (4.39)	0.091*** (5.06)	0.088*** (3.94)	-0.095*** (-4.29)	-0.090*** (-4.99)	-0.087*** (-3.85)
<i>Intangible</i>	-0.027 (-0.34)	0.141** (2.37)	-0.040 (-0.47)	0.047 (0.60)	-0.124** (-2.07)	0.055 (0.66)
<i>LossFirm</i>	-0.015 (-1.53)	-0.035*** (-3.66)	-0.004 (-0.37)	0.016 (1.61)	0.036*** (3.77)	0.004 (0.41)
Observations	109,253	108,386	108,251	109,253	108,386	108,251
Adjusted R <sup>2</sup>	0.164	0.140	0.189	0.164	0.146	0.184
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

**Note:** This table presents regression results for tests of the association between state ownership and tax planning (Equation (3)) estimated using an entropy-balanced sample. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix B. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

**Table 5: Descriptive Statistics (Propensity Score Matching)**

<i>Variables</i>	<b>N</b>	<b>Mean</b>	<b>S.D.</b>	<b>Q1</b>	<b>Median</b>	<b>Q3</b>
<b>Panel A: Full Sample after Propensity Score Matching</b>						
<i>ETR</i>	3,537	0.2287	0.2252	0.0297	0.1769	0.3333
<i>TaxAvoid</i>	3,537	0.0697	0.2256	-0.0398	0.1182	0.2639
<i>RoA</i>	3,537	0.0507	0.0749	0.0140	0.0304	0.0616
<i>Tangibility</i>	3,537	0.6183	0.2890	0.4218	0.7046	0.8354
<i>Size</i>	3,537	10.1149	1.9694	8.9681	10.3510	11.4322
<i>SalesGrowth</i>	3,537	0.0624	0.2589	-0.0071	0.0369	0.0877
<i>Leverage</i>	3,537	0.3053	0.2352	0.1170	0.2526	0.4438
<i>Intangible</i>	3,537	0.0217	0.0588	0.0002	0.0029	0.0148
<i>Lossfirm</i>	3,537	0.1829	0.3867	0	0	0
<b>Panel B: Sample after PSM - Non-SOEs only</b>						
<i>ETR</i>	1,668	0.2279	0.2086	0.0382	0.1994	0.3333
<i>TaxAvoid</i>	1,668	0.0711	0.2099	-0.0337	0.0949	0.2586
<i>RoA</i>	1,668	0.0550	0.0735	0.0168	0.0353	0.0665
<i>Tangibility</i>	1,668	0.6177	0.2913	0.4095	0.6956	0.8426
<i>Size</i>	1,668	10.0626	1.9917	8.8864	10.2624	11.3655
<i>SalesGrowth</i>	1,668	0.0674	0.2677	-0.0169	0.0386	0.1100
<i>Leverage</i>	1,668	0.3019	0.2425	0.1079	0.2427	0.4404
<i>Intangible</i>	1,668	0.0209	0.0640	0.0001	0.0021	0.0111
<i>Lossfirm</i>	1,668	0.1745	0.3796	0	0	0
<b>Panel C: Sample after PSM - SOEs only</b>						
<i>ETR</i>	1,869	0.2295	0.2390	0.0250	0.1568	0.3413
<i>TaxAvoid</i>	1,869	0.0684	0.2388	-0.0506	0.1384	0.2677
<i>RoA</i>	1,869	0.0469*	0.0760	0.0124	0.0267	0.0541
<i>Tangibility</i>	1,869	0.6188	0.2869	0.4542	0.7093	0.8300
<i>Size</i>	1,869	10.1616	1.9486	9.0319	10.4621	11.4694
<i>SalesGrowth</i>	1,869	0.0579	0.2509	0.0008	0.0360	0.0769
<i>Leverage</i>	1,869	0.3083	0.2285	0.1253	0.2609	0.4480
<i>Intangible</i>	1,869	0.0224	0.0538	0.0005	0.0037	0.0191
<i>Lossfirm</i>	1,869	0.1905	0.3928	0.0000	0.0000	0.0000

**Note:** This table presents descriptive statistics for the sample after Propensity Score Matching (with replacement). Panel A presents information for the full sample. Panel B (Panel C) displays information for the subsample of firm-years of Non-SOEs (SOEs). In Panel C, \* denotes significant differences relative to Panel B at the 1% level (two-tailed).

**Table 6: Regression with Propensity Score Matching**

Variables	Dependent Variable: <i>ETR</i>			Dependent Variable: <i>TaxAvoid</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs	Full Sample	Full Sample w/ <i>Benefit</i> SOEs	Full Sample w/ Non- <i>Benefit</i> SOEs
<b><i>SOE</i></b>	<b>0.023**</b> (2.04)	<b>0.042***</b> (3.06)	<b>0.004</b> (0.27)	<b>-0.025**</b> (-2.15)	<b>-0.041***</b> (-2.99)	<b>-0.007</b> (-0.46)
<i>RoA</i>	-0.264*** (-3.25)	-0.282*** (-4.38)	-0.265*** (-2.87)	0.268*** (3.32)	0.292*** (4.65)	0.268*** (2.88)
<i>Tangibility</i>	-0.014 (-0.62)	-0.018 (-0.85)	-0.023 (-0.93)	0.009 (0.37)	0.013 (0.61)	0.020 (0.80)
<i>Size</i>	-0.009** (-2.45)	-0.013*** (-3.66)	-0.007* (-1.77)	0.010*** (2.88)	0.014*** (4.05)	0.008** (2.09)
<i>SalesGrowth</i>	-0.006 (-0.42)	-0.013 (-0.88)	-0.004 (-0.24)	0.008 (0.55)	0.015 (0.98)	0.007 (0.40)
<i>Leverage</i>	0.095*** (3.83)	0.093*** (4.11)	0.084*** (3.06)	-0.092*** (-3.70)	-0.091*** (-4.00)	-0.082*** (-2.96)
<i>Intangible</i>	0.011 (0.12)	0.152* (1.70)	-0.008 (-0.08)	0.006 (0.07)	-0.137 (-1.54)	0.018 (0.19)
<i>LossFirm</i>	-0.009 (-0.75)	-0.030** (-2.20)	0.007 (0.47)	0.010 (0.79)	0.031** (2.25)	-0.006 (-0.46)
Observations	3,735	2,868	2,734	3,735	2,868	2,734
Adjusted R <sup>2</sup>	0.162	0.144	0.187	0.162	0.151	0.184
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

**Note:** This table presents regression results for tests of the association between state ownership and tax planning (Equation (3)) estimated on a matched sample using Propensity Score Matching (with replacement). The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix B. In Columns 1 and 4, the estimation uses the full sample. In Columns 2 and 5 (3 and 6), we only include SOEs with state owners that do (do not) directly benefit from the tax revenues. We include state, industry (NACE two digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

**Table 7: SOE Sample**

Variables	Dependent Variable: <i>ETR</i>			Dependent Variable: <i>TaxAvoid</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)	Coef. (t-stat)
	All SOEs	LBT rate below median	LBT rate above median	All SOEs	LBT rate below median	LBT rate above median
<b><i>Benefit</i></b>	<b>0.043**</b> (2.34)	<b>0.048*</b> (1.84)	<b>0.013</b> (0.50)	<b>-0.039**</b> (-2.09)	<b>-0.046*</b> (-1.76)	<b>-0.014</b> (-0.51)
<i>RoA</i>	-0.215 (-1.15)	-0.662*** (-3.18)	-0.057 (-0.24)	0.210 (1.13)	0.645*** (3.13)	0.056 (0.23)
<i>Tangibility</i>	-0.044 (-0.92)	-0.034 (-0.42)	-0.048 (-0.80)	0.031 (0.65)	0.029 (0.36)	0.041 (0.68)
<i>Size</i>	-0.005 (-0.72)	-0.018** (-2.55)	0.004 (0.40)	0.007 (1.04)	0.018*** (2.62)	-0.003 (-0.31)
<i>SalesGrowth</i>	0.003 (0.18)	0.015 (0.53)	0.004 (0.15)	-0.002 (-0.10)	-0.013 (-0.46)	-0.002 (-0.10)
<i>Leverage</i>	0.142*** (2.90)	0.121* (1.90)	0.167** (2.33)	-0.140*** (-2.84)	-0.120* (-1.90)	-0.164** (-2.29)
<i>Intangible</i>	0.012 (0.07)	-0.324 (-1.46)	0.352 (1.25)	0.019 (0.12)	0.330 (1.48)	-0.345 (-1.23)
<i>LossFirm</i>	-0.025 (-1.28)	-0.012 (-0.42)	-0.027 (-0.98)	0.027 (1.37)	0.014 (0.52)	0.029 (1.04)
Observations	1,869	859	1,009	1,869	859	1,009
Adjusted R <sup>2</sup>	0.075	0.110	0.076	0.072	0.107	0.077
State FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

**Note:** This table presents regression results for tests of the association between state ownership and tax planning (Equation (4)) estimated using OLS. The sample only includes SOEs. The dependent variables are *ETR* (Columns 1-3) and *TaxAvoid* (Columns 4-6). All variables are defined in Appendix B. In Columns 1 and 4, the estimation uses the full sample of SOEs. In Columns 2 and 5 (3 and 6), we partition the sample and only include observations with LBT multipliers below (above) the median LBT rate. We include state, industry (NACE one digit), and year indicators. Standard errors are clustered on the firm level and t-statistics are reported in parentheses. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed).