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Tax avoidance and state ownership — The case of Sweden

Axel Hilling [a], Frederik Lundtofte [b,c], Niklas Sandell [d], Amanda Sonnerfeldt [d], Anders Vilhelmsson [e,*]

[a] Department of Business Law, Lund University, Sweden
[b] Aalborg University Business School, Aalborg University, Denmark
[c] Danish Finance Institute, Denmark
[d] Department of Business Administration, Lund University, Sweden
[e] Department of Economics, Lund University, Box 7082, 22007 Lund, Sweden

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ABSTRACT

We propose a simple theoretical model for how a company with both private and state shareholders decides on its optimal tax policy. The model predicts that even in the absence of state shareholding, a company will not always pick a tax policy that minimizes taxes. Conversely, majority state ownership will generally not result in zero tax avoidance. Using panel regressions on the entire population of state-owned as well as publicly listed Swedish companies from 2000–2019, we find that a one standard deviation increase in state ownership increases corporate tax payments by around 14%.

1. Introduction

This paper investigates, theoretically and empirically, how state ownership affects corporate tax avoidance.[1] While there is a growing body of empirical literature on how corporate governance impacts tax avoidance, recently surveyed in Kovermann and Velte (2019), little theoretical work has been done, with Desai et al. (2007) being a notable exception. While Desai et al. (2007) present a model focusing on the agency conflict between management and owners, our focus is on the conflicting interests of private and state shareholders, where the state as a shareholder, as opposed to private interest, has no incentive for its companies to reduce taxes.

Our model shows that, in general, a company will not pick a tax policy that minimizes taxes since this does not maximize shareholder value. Empirically, our findings are closely related to Bradshaw et al. (2019), who find that state ownership lowers tax avoidance in China. In contrast to Bradshaw et al. (2019), where state ownership is binary, we exploit a Swedish setting where partial ownership by the state, either directly or indirectly through state-controlled pension funds, is common. This allows us to construct a continuous ownership measure.

Using the entire population of state-owned and publicly listed Swedish firms from 2000–2019, we find that the level of tax avoidance is a decreasing function of state ownership. A one standard deviation increase in state ownership increases the taxes paid by a company by around 14%. Contrary to Dyreng et al. (2017), who find a significant decrease in the US effective tax rate (ETR) over time, we find that the ETR has decreased less than the statutory rate in Sweden.

2. A theoretical framework of tax avoidance and state ownership

Let $s \in [0, 1]$ denote the share of state ownership. For simplicity, we assume that non-state ownership occurs at a frequency of $(1 - s)$ in an investor community with a total mass of one. By $\pi > 0$ and $\tau \in (0, 1)$, we denote the pre-tax profits and ETR, both in the absence of tax avoidance. Let $\alpha \in [0, \alpha_{max}]$ where $\alpha_{max} \leq \tau$ denote the degree of tax avoidance. The ETR paid by a company is $\tau - \alpha$. Here, α_{max} is the maximum possible tax avoidance the company can achieve given operational constraints. Picking a tax policy corresponds to picking an α value. We assume that tax avoidance has a price in the form of reputational damage, as documented in e.g. Graham et al. (2014), and litigation risk, which we model as being proportional to the degree of tax avoidance. That is,

$$\textit{dollar cost of tax avoidance} = \pi c \alpha,$$

* Corresponding author.
E-mail address: anders.vilhelmsson@nek.lu.se (A. Vilhelmsson).

[1] Following Dyreng et al. (2008) we define tax avoidance as all transactions that reduce a company's tax obligations.

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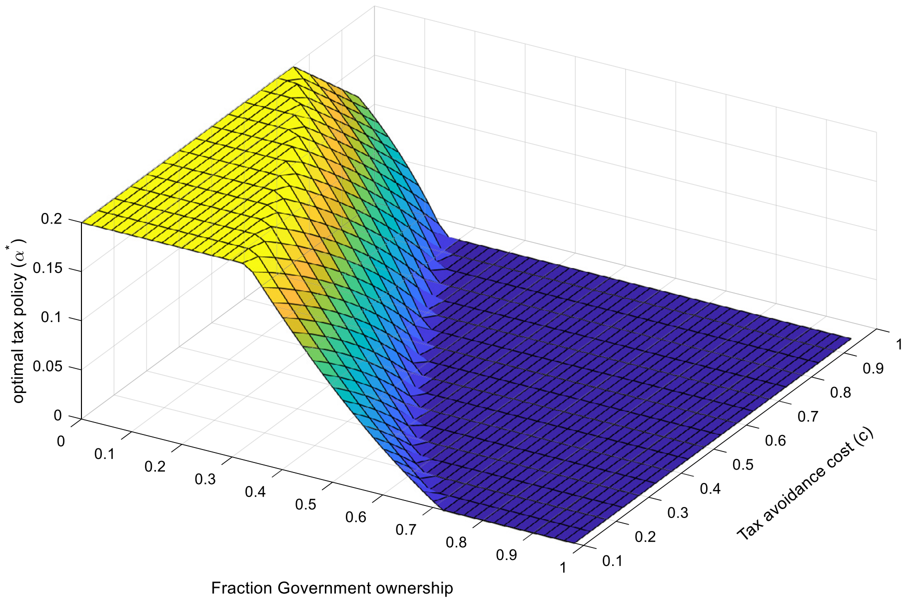

Fig. 1. Optimal tax policy as a function of the fraction of state ownership and tax avoidance cost for the parameters $f(s) = s$, $\tau = \alpha_{max} = 0.20$.

where $c > 0$ denotes the proportional cost of tax avoidance. Hence, the pretax profit equals $\pi(1 - c\alpha)$. The gain from tax avoidance is given by

$$\textit{dollar gain of tax avoidance} = \pi(1 - c\alpha) \cdot \alpha,$$

which equals the decrease in taxes paid resulting from the tax avoidance. For simplicity, we assume that all profits are paid out as dividends to shareholders and as taxes to the state. Thus, on average, a non-state (NS) shareholder receives

$$\textit{Payout to NS shareholder} = \pi(1 - c\alpha)(1 - (\tau - \alpha)) \quad (1)$$

and a state shareholder (S) receives

$$\textit{Payout to S shareholder} = \pi(1 - c\alpha)(\tau - \alpha) + s\pi(1 - c\alpha)(1 - (\tau - \alpha)), \quad (2)$$

where the first term is the tax revenue and the second term is the dividend. The tax policy is set by a manager using an incentive program that pays a reimbursement that is a fraction, δ, of a weighted average of the payouts for state and non-state shareholders.[2]

We model the shareholder weights, ρ for the state and $(1-\rho)$ for non-state shareholders, as a function of the relative ownership shares. That is, $\rho = f(s)$, where $f(0) = 0$ (complete alignment with NS shareholders when $s = 0$) and $f(1) = 1$. Further, we want $f'(s) > 0$ so that increasing ownership allows for a larger influence on managerial incentives. The manager picks the tax policy by solving

$$\begin{aligned} &\max_{\alpha} \delta[f(s)(\pi(1 - c\alpha)(\tau - \alpha) + s\pi(1 - c\alpha)(1 - (\tau - \alpha))) \\ &\quad + (1 - f(s))\pi(1 - c\alpha)(1 - (\tau - \alpha))] \\ &\quad s.t. 0 \le \alpha \le \alpha_{max} \end{aligned}$$

The following proposition presents the optimal tax policy given an upper bound on $f(s)$ which ensures that the objective function is strictly concave.

2 For simplicity, we assume that the incentive program is exogenously given.

Proposition 1. *Suppose that* $f(s) < \frac{1+s}{4(1-s)}$. *Then, the optimal degree of tax avoidance is given by*

$$\alpha^* = \begin{cases} \alpha_{max} \text{ if } \overline{\alpha} \ge \alpha_{max}; \\ \overline{\alpha} \text{ if } 0 < \overline{\alpha} < \alpha_{max}; \\ 0 \text{ otherwise}, \end{cases}$$

where

$$\overline{\alpha} = \frac{1 - (1 - \tau)c + [((1 - s) - (2 - s)\tau)c - (2 - s)]f(s)}{2[1 - (2 - s)f(s)]c}.$$

We note that the upper bound on $f(s)$ is not very restrictive, e.g. the choice of $f(s) = s$ satisfies the upper bound.

Fig. 1 shows the joint impact of tax avoidance cost and state ownership on the optimal tax policy. The results confirm the discussions in Bradshaw et al. (2019) that tax avoidance decreases with state ownership. Without tax avoidance costs, the state ownership must be around 70% to bring tax avoidance to zero ($\alpha^* = 0$). We also find that even in the absence of state ownership, for sufficiently high tax avoidance costs a company will not pick a tax policy that minimizes taxes ($\alpha^* < \alpha_{max}$).

3. Data and method

Accounting data for listed companies are collected from Compustat/Capital IQ. Data for non-listed firms are hand collected from annual reports. We follow Dyreng et al. (2017) for our tax avoidance measure, ETR = Income Taxes Total/Pretax Income (ETR). Following Chen et al. (2010) and Dyreng et al. (2017), we censor the ETR to be within [0,1].

As control variables, we use earnings before extraordinary items over total assets (ROA total debt divided by total assets (LEV), plant and equipment over total assets (PPE), intangible assets over total assets (INTANG), the log of total assets (SIZE) and foreign sales over total sales (FORSALES). All control variables are winsorized at the 5% and 95% levels, and results are similar for a range of values up to the 1% and 99% levels.

$$ETR_{it} = \alpha_t + \beta_1 \textit{State ownership} + \boldsymbol{\Gamma}\mathbf{X} + \epsilon_{\mathbf{it}}$$

ETR_{it} is the ETR for company i during year t, α_t is a year fixed effect, state ownership is either the share of state ownership (State C) or a dummy variable taking the value 1 if the state has any ownership (State D). $\boldsymbol{\Gamma}$ is a vector of coefficients and $\mathbf{X}$ is a matrix of the control variables.

Table 1
ETR over time.

Year	All FIRMS	State OWNERSHIP > 50%
2000	0.255	0.255
2001	0.263	0.249
2002	0.297	0.331
2003	0.281	0.342
2004	0.267	0.233
2005	0.240	0.222
2006	0.233	0.184
2007	0.241	0.213
2008	0.256	0.236
2009	0.244	0.286
2010	0.251	0.274
2011	0.258	0.289
2012	0.254	0.238
2013	0.240	0.255
2014	0.223	0.227
2015	0.230	0.245
2016	0.227	0.298
2017	0.221	0.222
2018	0.217	0.167
2019	0.209	0.209
Average	**0.243**	**0.248**

The sample period is 2000–2019.

4. Results

Table 1 displays the ETR over time. Contrary to Dyreng et al. (2017), who find significant decreases in US ETR, we find that the ETR in Sweden only decreased by 4.6% units whereas the statutory tax rate has decreased by 6.8% units during the same period. Column 2 shows the ETR for companies with >50% state ownership which, perhaps surprisingly, have a similar ETR.

In Table 2, using panel regressions, we find that ETR is increasing in ROA, leverage, and foreign sales. Since state-owned companies in our sample are on average smaller, less profitable, and have less foreign sales it is very important to conduct a multiple regression analysis that includes these variables, since we would otherwise have an omitted variables problem. The results from using the share of state ownership show that a one-unit increase in state ownership (going from no to complete zero to 100%) increases the ETR by around 0.087 which is comparable in size to the dummy variable specification. A one standard deviation increase in state ownership (0.383) increases ETR by 0.089*0.383 = 3.4% which is an increase of 0.034/0.243 = 14.0% compared to the average ETR.

5. Conclusion

This paper proposes the first theoretical model for how a company with both private and state shareholders decides on a tax policy. The model predicts that even in the absence of state ownership, a company will not always pick a tax policy that minimizes taxes. Further, majority state ownership will generally not result in zero tax avoidance. Empirically, we find that, based on the specification, fully state-owned companies have an ETR of 8%–10% units higher than privately-owned companies. It is, however, fair to point out that the estimation is imprecise and only significant at the 10% level. The effect is large compared to Bradshaw et al. (2019), who find that state-owned enterprises in China pay an ETR that is 1.4% units higher than privately-owned enterprises.

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Table 2
Determinants of ETR.

	(1) ETR	(2) ETR
State D	0.096*	
	(0.054)	
State C		0.087*
		(0.049)
ROA	0.239***	0.241***
	(0.063)	(0.063)
LEV	0.149***	0.149***
	(0.027)	(0.027)
PPE	−0.123	−0.111
	(0.108)	(0.103)
INTANG	0.145	0.130
	(0.114)	(0.109)
SIZE(log)	−0.006**	−0.007***
	(0.003)	(0.002)
FORSALES	0.050***	0.049***
	(0.013)	(0.013)
Constant	0.273***	0.280***
	(0.056)	(0.055)
N	2300	2300
R^2	0.091	0.090

Standard errors clustered on the firm level are presented in parenthesis.
*$p < 0.10$.
**$p < 0.05$.
***$p < 0.01$.

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Appendix. Proofs of propositions

Proof of Proposition 1. Since $\delta\pi > 0$, maximizing the objective function is equivalent to maximizing $\Gamma(\alpha) = f(s)((1-c\alpha)(\tau-\alpha) + s(1-c\alpha)(1-(\tau-\alpha))) + (1-f(s))(1-c\alpha)(1-(\tau-\alpha))$.

Further, since the objective function is continuous and the domain is a compact set, it follows from the extreme value theorem that the function attains a maximum on the domain. Second, we note that

$$\Gamma''(\alpha) < 0 \text{ for all } \alpha \in \mathbb{R} \Leftrightarrow f(s) < \frac{1+s}{4(1-s)}.$$

That is, the objective function is strictly concave in α for all $\alpha \in \mathbb{R}$ if and only if $f(s) < \frac{1+s}{4(1-s)}$.

In the following, suppose that $f(s) < \frac{1+s}{4(1-s)}$. Since, in this case, the objective function is a continuous, strictly concave function, there can only be one maximum on the compact domain $[0, \alpha_{max}]$. Further, $\Gamma'(\overline{\alpha}) = 0$. Since the objective function is strictly concave, $\overline{\alpha}$ is the global maximum on the domain $\alpha \in \mathbb{R}$. Consequently, if $\overline{\alpha}$ is in the interior of the domain $[0, \alpha_{max}]$, then $\alpha^* = \overline{\alpha}$. If, on the other hand, $\overline{\alpha} \leq 0$, then $\alpha^* = 0$. Finally, if $\overline{\alpha} \geq \alpha_{max}$, we have that $\alpha^* = \alpha_{max}$. □

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