

Why do not all firms engage in tax avoidance?

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May 31, 2016

Abstract

Empirical evidence suggests that there is substantial cross-firm variation in the extent of tax avoidance. However, this variation is not well understood. This paper provides a theoretical background for testing, and thus explaining, cross-firm differences in tax avoidance. We develop a formal model with two agents to analyze the incentives that lead firms to engage in tax avoidance. The tax avoidance decision is a function of moral hazard, tax-planning costs, and the potential to increase earnings. If the potential to increase earnings is low, the tax-planning decision is determined by moral-hazard problems. In contrast, when this potential is high, the tax-planning decision is mainly driven by tax-planning costs, such as reputational and political costs. One implication of our model is that moral hazard can (partly) explain why some firms do not engage in tax avoidance: Severe problems of moral hazard make tax avoidance less likely. Our model can be applied to test differences in tax avoidance between different types of firms.

Keywords: *moral hazard, tax avoidance, tax planning*

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We thank Kay Blaufus, Markus Grottke (discussant), Jochen Hundsdoerfer, Daniela Lorenz, Maximilian Müller, Rainer Niemann, Martin Ruf, Harm Schütt, Caren Sureth, Antonio de Vito, participants of the EAA Annual Congress 2016 in Maastricht, the VHB Annual Congress 2016 in Munich, the 2014 GEABA conference in Regensburg, and seminar participants at the WHU – Otto Beisheim School of Management, the University of Bayreuth, and the University of Paderborn for helpful comments and suggestions.

1 Introduction

Tax avoidance and aggressive tax planning have attracted the interest of the media, academia, and policy makers.¹ According to the OECD, there is the widespread perception that “domestic and international rules on the taxation of cross-border profits are now broken and [...] taxes are only paid by the naive.” Tax-planning activities generally increase after-tax cash flows (e.g., due to the optimization of the effective tax rate) and thus ultimately enhance firm value (e.g., Desai and Dharmapala, 2009a). Engaging in tax-planning activities thus seems to be a reasonable strategy for every firm. In response to tax avoidance, several countries have sought to address weaknesses in international tax rules. For example, the explicit aims of the 2015 Budget Proposal of the United States were “closing loopholes and [...] reforming the international tax system.”²

Although tax-planning activities that enable tax avoidance are common, empirical studies show that there is substantial cross-sectional variation in the extent to which firms engage in such practices. In contrast to what is widely assumed, the effective tax rates that some firms pay are close to or even above the statutory tax rate (Dyreng et al., 2008). Moreover, empirical studies that use the effective tax rate as a dependent variable typically report R-squared values below 15%.³ Related to this, Gallemore et al. (2014, p. 1103) thus conclude that “[w]hile the evidence indicates there is wide variation in tax avoidance across firms, the extant literature has a difficult time explaining this variation.”⁴ This paper aims to explain theoretically the so-called “under-sheltering puzzle” (Weisbach, 2002) in order to shed light on the perplexing empirical observation that not all firms engage equally, if at all, in legal tax avoidance.

According to the recently proposed agency perspective of corporate tax avoidance (Desai and Dharmapala, 2009a), most firms cannot be regarded as individual actors and therefore

¹ Throughout the paper, the terms “tax avoidance” and “tax planning” are used synonymously to describe legal tax-planning activities.

² See page 21 of the Fiscal Year 2015 Budget of the U.S. Government, available at <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2015/assets/budget.pdf>, last accessed November 29, 2014.

³ In the following papers, the highest reported R-squared ranges from 9.4% to 14.9% for cash-effective tax rates: Armstrong et al. (2012); Badertscher et al. (2013); Chen et al. (2010); Cheng et al. (2012); Dyreng et al. (2008, 2010); Hope et al. (2013); Kubick et al. (2015); Rego (2003); Rego and Wilson (2012). Dyreng et al. (2010) obtained an R-squared of 23.6% when they included year, firm, CEO, CFO, and other fixed effects.

⁴ There are several calls in the literature for more research on this issue; see, e.g., Hanlon and Heitzman (2010).

corporate tax compliance should be analyzed in a principal-agent framework (Slemrod, 2004). In a related study, Chen et al. (2010, p. 42) argue that “the nature and extent of agency conflicts, such as the costs arising from hidden actions of managers, can affect the level of tax aggressiveness.” Desai and Dharmapala (2006, 2009a, 2009b) are the first to examine more closely the interrelation between moral hazard, the generation of earnings, and tax avoidance in an attempt to explain why not all firms engage in tax avoidance. These authors assume that the relation between opportunities for tax avoidance and opportunities for the diversion of rents is always positive. Being able to divert rents, however, constitutes an important counterforce to the otherwise unhampered engagement in tax-avoidance activities.

In this paper, we build on the idea that Desai and Dharmapala (2006, 2009a, 2009b) put forward; namely, that the tax-planning decision is influenced by moral hazard and the earnings figure. In contrast to them, however, we assume that after-tax earnings will be influenced by the decisions of the tax manager, which will mainly have an effect on the effective tax rate (ETR),⁵ and by the decisions of the CEO, which will mainly become reflected in gross earnings. We furthermore argue that owners use incentives to mitigate the moral hazard that is associated with both types of decisions, with the ultimate goal of maximizing net earnings. Our approach is thus a response to the criticism that “the theory on corporate tax avoidance in an agency framework is relatively young and is not well developed” (Hanlon and Heitzman, 2010, p. 145). More specifically, the ultimate aim of this paper is to draw on previous insights and develop a theoretical model that allows us to derive testable hypotheses for future empirical research on tax avoidance.

We develop a principal-agent-model with one principal (the firm) and two agents (a tax manager and the CEO), in which the agents provide unobservable effort towards tax-planning activities and towards generating earnings. To mitigate the resulting moral-hazard problem, the principal offers incentive contracts to the agents that are based on adequate performance measures. The CEO is incentivized on the basis of earnings and, according to the empirical tax literature (e.g., Armstrong et al., 2012; Graham et al., 2014), the tax manager is compensated on the basis of the ETR. The general and intuitive outcome of our model is that a firm’s decision to engage in tax planning rests on the balancing of expected benefits and costs associated with these activities. In particular, the decision to engage in tax planning depends on the interaction

⁵ As we discuss below, we use a GAAP ETR in our model. However, because we assume that earnings are equal to cash flows and that there are no deferred taxes, cash and GAAP ETR are the same in our model.

between (1) firm-level factors, such as the *probability of successful tax planning*, *reputational costs*, and *political costs*, (2) agent-level factors, i.e., the costs of motivating the tax manager and the CEO to exert effort for tax planning and generating earnings (*incentivization costs*), and (3) the effect of the CEO's effort on pre-tax earnings (the *potential to increase earnings*).

To illustrate our model outcome, we apply the model to two cases, public versus private and family versus non-family firms. Both comparisons are relevant as more than half of GDP in OECD countries is generated in private firms.⁶ Similarly, family firms, which can be private or public, account for more than half of GDP and jobs in the majority of countries.⁷ The model interpretation is straightforward when the cost factors point in the same direction, as, for example, in comparisons between private and public firms. Given that private firms face lower incentivization costs and disclose less information to the public, which results in lower political and reputational costs, we expect private firms to engage more in tax avoidance than public firms. In contrast, when comparing family firms and non-family firms, the model's implications are ambiguous. Family firms face higher reputational costs than non-family firms, which reduces the likelihood that they engage in tax-planning activities. At the same time, the greater concentration of ownership and control in family firms reduces the magnitude of the moral-hazard problem (Berle and Means, 1932; Francis and Smith, 1995; Shleifer and Vishny, 1997) and thus the costs of incentivizing managers. This increases the propensity of family firms to engage in tax avoidance. Our analysis shows that the final decision on whether to engage in tax avoidance or not critically depends on the firm's potential to increase earnings. Specifically, we find that if the potential to increase earnings is low, firms with low incentivization costs, such as family firms, are more likely to engage in tax planning than firms with high incentivization costs, such as non-family firms, because in the case of the latter, the low potential to increase earnings does not justify the high costs of incentivizing the manager to exert effort. In contrast, if the potential to increase earnings is high, the tax-planning decision is determined by the extent of political and reputational costs, whereas incentivization costs become less important. In such cases, non-family firms are more likely to engage in tax planning than family firms.

The model shows that there are interaction effects between agent-level costs, firm-level costs, and the potential to increase earnings. One possible interpretation of this effect could be that

⁶ Source: http://siteresources.worldbank.org/CGCSRLP/Resources/SME_statistics.pdf, last accessed May 27, 2016

⁷ Source: <http://www.ffi.org/page/globaldatapoints>, last accessed May 27, 2016

internal firm-specific internal factors, such as cost effectiveness or management quality, create potential for increasing earnings. Another interpretation might be that firms with a lower potential to increase earnings operate in a more competitive environment, because in such environments earnings will not change much even if the manager exerts high effort. In contrast to the findings of recent empirical studies (Cai and Liu, 2009; Kubick et al., 2015; Rego and Wilson, 2012), we find that in such cases the effect of competition and incentivization costs can be ambiguous. For that reason, future empirical research on tax avoidance should take into account the potential to increase earnings and its interaction with the costs of tax planning.

Our analysis contributes to several strands in the literature. First, the paper provides a theoretical background to the recent empirical literature on tax avoidance (e.g., Dyreng et al., 2008, 2010; Gupta and Newberry, 1997; Kubick et al., 2015; Rego, 2003; Richardson and Lanis, 2007) and sheds light on why not all firms engage in tax planning or have the same level of tax avoidance (e.g., Dyreng et al., 2008; Hanlon and Slemrod, 2009; Weisbach, 2002). Second, our empirical predictions offer a more nuanced view of the conditions that favor tax avoidance than most existing empirical studies on tax avoidance and governance or ownership structures do (e.g., Badertscher et al., 2013; Chen et al., 2010; Cheng et al., 2012; Rego and Wilson, 2012). For example, Badertscher et al. (2013) show that firms with less concentrated ownership and control are generally more tax-aggressive, whereas our model implies that the impact of separating ownership from control on tax avoidance depends on the potential to increase earnings. Third, we contribute to the recent analytical literature on delegated tax planning in a moral-hazard setting (Chen and Chu, 2005; Crocker and Slemrod, 2005; Desai and Dharmapala, 2006). Previous works, such as the studies by Chen and Chu (2005) and by Crocker and Slemrod (2005) consider illegal tax minimization and have a normative focus. Chen and Chu (2005) analyze the efficiency of internal control mechanisms, while the primary focus of Crocker and Slemrod (2005) is to derive implications for policy-makers who try to reduce illegal tax minimization. In their analysis of the trade-off between tax avoidance and the diversion of rents by a manager, Desai and Dharmapala (2006) identify in which conditions stronger incentives and a reduced diversion of rents are associated with increased or decreased tax avoidance. They also examine how this link may depend on whether there are weaker or stronger governance structures. However, Desai and Dharmapala (2006) assume that earnings, governance structures, and the contract are exogenous, which implies that the manager is the only decision-maker in their

model. Thus, in their study, there is no strategic interaction between owners and manager; moreover, the authors assume, but do not explicitly model a setting of moral hazard. More generally, none of these studies directly investigates the interaction of moral hazard with respect to the generation of earnings and with respect to tax planning by simultaneously examining the different types of costs that are relevant to legal tax avoidance. We fill this research gap and develop a model that enables us to derive testable predictions for future empirical research on tax avoidance.

2 Definition and Costs of Tax Planning

2.1 Definition of Tax Planning

Before elaborating on the various costs in greater detail, we need to clarify how tax planning is understood in this paper. To date there is no standard definition of this term (Hanlon and Heitzman, 2010). Desai and Dharmapala (2009b) describe tax-planning activities as “transactions that have no purpose other than tax avoidance” and, referring to Michael Graetz, define tax shelters as something “done by very smart people that, absent tax considerations, would be very stupid” (Desai and Dharmapala, 2009b, p. 170). Applying this definition, we restrict tax planning to legal activities and thus exclude all illegal activities, because illegal tax planning is not appropriate for our purposes and the inclusion of detection risk and penalties is beyond the scope of our analysis.

Although, in principle, our model is open to other interpretations that have been suggested in the literature (Hanlon and Heitzman, 2010), here we define tax planning as costly legal activities that all firms will contemplate in order to optimize their tax burden. Even thus defined, however, tax planning includes a legal gray area given that some tax-planning activities may not be deemed acceptable by government agencies. In fact, there are several legal activities that may not be accepted by the tax authorities, which makes their outcomes uncertain. This is why listed U.S. firms are mandated to disclose uncertain tax benefits (UTB) in their financial statements.

Our outcome measure of tax planning in the model is the GAAP ETR, which has already been used in previous empirical studies (for an overview see, e.g., Hanlon and Heitzman, 2010)

and theoretical works (Chen and Chu, 2005; Crocker and Slemrod, 2005).⁸ A lower effective tax rate can be achieved either by reducing taxable income while holding pre-tax earnings constant or by shifting taxable profits to a low-tax country. For example, consider a firm with earnings of 100 and a tax rate of 30%. The firm can either shift the entire profit to a low-tax country with a tax rate of, e.g., 15% (i.e., the total tax base remains constant) or reduce the taxable income in the high-tax country to 50 while keeping earnings constant at 100 (i.e., the total tax base is reduced). Both tax-planning alternatives result in an effective tax rate of 15% while pre-tax earnings are kept constant. In our model, we represent these two potential effects by the difference in effective tax rates.

2.2 Costs of Tax Planning

Firms face a variety of costs when they engage in tax-planning activities. Some of the monetary costs of tax avoidance, such as expenses for tax consulting or for running a tax department, are direct costs. These costs may depend on firm size and other financials (e.g., Rego, 2003). In addition to these, there are potential costs that depend on the characteristics of corporate governance and ownership. These include listing status, family influence, and the magnitude of moral-hazard problems a firm faces. Among these additional costs, reputational costs and political costs at the firm-level and incentivization costs at the manager-level all depend on elements of corporate governance. In the following, we discuss these costs in more detail.

2.2.1 Reputational Costs

Reputational costs capture the idea that firms and their owners can suffer psychological costs if their brand name, firm name, or owner name(s) are associated with negative publicity or negative public perception as a result of (legal) tax-planning activities (Graham et al., 2014). Such activities could also trigger a backlash from stakeholders, such as consumers or shareholders, which would have indirect and undesirable monetary effects (Bankman, 2004; Graham et al., 2014; Hanlon and Slemrod, 2009). Although stakeholders are likely to be heterogeneous in their views on tax avoidance, some stakeholders like firms to pay taxes (Bankman, 2004; Chyz et al., 2013). After all, taxes are funds that governments (ideally) spend in the interest

⁸ As our model assumes that cash flows are equal to earnings, i.e., that there are no accruals and deferred taxes, our model's tax rate is also similar to the cash ETR that has been commonly used in empirical studies (see, e.g., Dyreng et al., 2008, 2010).

of these stakeholders. If firms try to avoid taxes, at least some stakeholders may feel that they are being short-changed.

Some earlier works stressed that reputational concerns may matter as a factor that partly determines whether a firm decides to engage in tax avoidance or not (Bankman, 2004). For example, Ernst & Young (2011) report that 89% of the largest companies they had surveyed responded that they were concerned about the media coverage of taxation. The study stresses that media reports on tax affairs can hurt “brand reputation and—in the worst case—shareholder value, even when such coverage is unwarranted or inaccurate” (Ernst & Young, 2011, p. 6). An illustrative example is the case of Starbucks in the United Kingdom, which is mentioned by Austin and Wilson (2015): Reuters⁹ uncovered that while Starbucks reported zero profits for tax purposes in the U.K., at the same time it portrayed its profits as far higher towards analysts and investors. After a barrage of public accusations of tax avoidance by a number of politicians, Starbucks U.K. declared willingness to voluntarily pay a large sum of additional taxes, although the company had not apparently violated any legislation. This concession by Starbucks U.K. shows how important the public perception of a firm as a good citizen, and therefore as a proper tax-payer, is to many firms.

While Hanlon and Slemrod (2009) and Austin and Wilson (2015) report a number of significant indications that reputational costs matter, Gallemore et al. (2014, p. 1105), who test several indicators of reputational effects, such as CEO/CFO and auditor turnover, lost sales, and increased advertising costs, conclude that they do “not observe a reputational effect of tax sheltering.” However, Hanlon and Heitzman (2010) have already pointed out the difficulties in measuring tax-planning strategies on the basis of archival data. As they explain, it is likely that the firms to whom reputation matters most are not represented in the samples. For this reason, Graham et al. (2014) conduct a survey of 600 corporate tax executives, whom they approached directly in order to gain insights into the respective firms’ incentives and disincentives for tax planning. The authors identify reputational costs as the second most important factor that determines a firm’s tax-planning decision, with 69% of the surveyed executives rating reputational concerns as important. Similarly, Austin and Wilson (2015) show that firms that face a potentially large reputational damage are less likely to avoid taxes. In sum, both anecdotal

⁹ <http://uk.reuters.com/article/us-britain-starbucks-tax-idUKBRE89E0EX20121015>, last accessed May 23, 2016.

and empirical evidence suggests that reputational concerns do play a role in determining how firms decide what extent of legal tax avoidance they should engage in.

2.2.2 Political Costs

The second category of firm-level costs are political costs (Watts and Zimmerman, 1986, 1990). Political costs result from the reaction of public agencies to corporate tax avoidance. For firms that operate as federal contractors in the U.S. or as government contractors in general, the risk of seeing their business with the government shrink is a motive for refraining from tax avoidance (Mills et al., 2013). The desire to avoid having their financial statements too often and too closely scrutinized by government agencies is another motive that leads firms to refrain from tax planning (Han and Wang, 1998; Key, 1997; Ramanna and Roychowdhury, 2010). If the relationship between a firm and the tax authority degenerates into distrust, that firm can expect to be under constant surveillance (Badertscher et al., 2009). In this case, an increase in costs can result from, e.g., devoting more resources to the preparation of financial statements or losing the favor of the tax authorities and thus having fewer opportunities for tax avoidance in the future. With regard to political costs, so far the literature has focused mainly on political visibility and accounting accruals (Fields et al., 2001; Han and Wang, 1998; Watts and Zimmerman, 1990). However, the basic line of argumentation these studies follow can be straightforwardly generalized to cases of tax avoidance—a link Zimmerman (1983) has already made. Indeed, accruals are often used in tax avoidance (Fields et al., 2001) and Zimmerman (1983) regards the (change in) ETR as an important component of political costs. In a similar vein, Mills et al. (2013) argue that in the U.S., federal contractors are sensitive to political costs and find that, all else being equal, these firms pay higher federal taxes, so their results provide strong support for the hypothesis that tax avoidance can entail significant political costs.

2.2.3 Incentivization Costs

The final category we consider is that of incentivization costs. In contrast to the other two cost categories, which represent firm-level costs, incentivization costs are incurred because of the delegation of tasks to a professional management. Given that the tax-planning task is delegated to an agent—typically, the tax manager (Crocker and Slemrod, 2005)—a firm needs to have in place sufficient incentives to motivate the tax manager to exert high effort. The

magnitude of these agent-level costs depends on how much a firm needs to pay a manager so that he or she exerts effort towards tax planning.¹⁰ Incentivization costs are a measure of how difficult it is to motivate managers to exert effort in a setting of moral hazard and can thus be viewed as an indicator of the severity of the moral-hazard problem a firm faces.¹¹ Higher incentivization costs can also occur when other rent-seeking stakeholders, such as labor unions, decrease the return to tax avoidance (Chyz et al., 2013).

The general idea that the costs associated with contracts can affect a firm’s accounting choices and therefore be used to explain cross-firm differences is not new (e.g., Watts and Zimmerman, 1986, 1990; Zimmer, 1986). However, only recently have authors begun to apply this logic to analyze the level of tax aggressiveness that firms exhibit (Chen et al., 2010). In this context, incentivization costs, which are related to the severity of the moral-hazard problems a firm faces, may be an important variable that explains the observed cross-firm variation in tax planning.

3 Theoretical Model

3.1 Outline and Underlying Assumptions

We base our model on a firm that hires two agents to put unobservable effort into two tasks: tax-planning activity and generating earnings. The decision to engage in tax planning is delegated to an agent—most probably the head of taxes or tax manager. As in standard models of moral hazard, we assume that the tax manager’s interests might differ from those of the firm and that he behaves in an opportunistic way that maximizes his personal utility. In order to align the interests of firm owners and decision-makers, firms need to have in place an effective incentive system. It has been suggested in the literature that in such a setting, the GAAP ETR may serve as an appropriate performance measure (Armstrong et al., 2012; Crocker and Slemrod, 2005; Graham et al., 2014). The tax manager’s salary then correlates negatively with the achieved ETR (Crocker and Slemrod, 2005). Among others, Armstrong et al. (2012) and Graham et al. (2014) provide empirical evidence that supports this view. Moreover, tax departments are seen

¹⁰ Throughout the paper, we use the masculine form for the manager or agent and the feminine form for the firm or the principal.

¹¹ In the context of the model, incentivization costs are the difference in the firm’s payoff between a first-best situation without moral-hazard problems and a second-best situation in which the managers’ actions are unobservable.

not so much as necessary cost centers, but as innovative profit centers (Crocker and Slemrod, 2005). This view is particularly relevant to analyses of cross-firm differences in tax avoidance, because of the interaction between tax planning and financial-accounting choices. Incentives for tax planning could then have (adverse) effects on financial-accounting choices and vice versa (Graham et al., 2011; Shakelford and Shevlin, 2001).

This reasoning leads to two conclusions. First, we can assume that the tax manager is responsible only for the GAAP ETR (Robinson et al., 2010; Shakelford and Shevlin, 2001). Second, we can infer that firms need to have in place separate incentives for the generation of earnings. The earnings outcome is usually the responsibility of a top manager, such as the CEO or the CFO. Philips (2003) shows that using after-tax earnings, rather than pre-tax earnings, as a performance measure for the provision of incentives at the CEO-level confers no tax advantage (in terms of lower ETRs). We therefore use pre-tax earnings in our model. Although firms need to coordinate incentives for tax planning and for generating earnings in order to achieve optimal results from the firm owners' perspective, the idea that the responsibilities for the ETR and for earnings are separate is supported by the literature. Specifically, Armstrong et al. (2012) show that while tax directors have incentives to manage the GAAP ETR, there are no such incentives for the CEO, general counsel, or the CFO. In our model we reflect these findings by using two agents, one responsible for the ETR and the other responsible for the earnings figure.

The timing of events in the model we now present is depicted in Figure 1.¹²

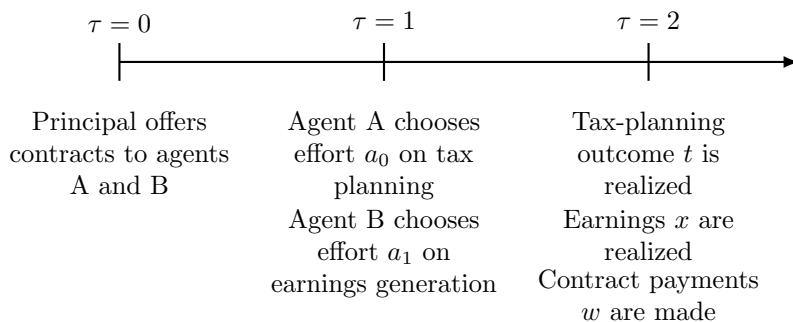


Figure 1: Timeline Simultaneous Setting

Our hidden-action model closely follows the approach delineated by Schmitz (2005). At the initial stage $\tau = 0$, the principal (i.e., the firm owners) contracts with two agents, a tax

¹² Our model does not include an interest rate, because all parties' final payoffs are realized at $\tau = 2$. We do not consider any interactions that occur thereafter.

manager (A) and a CEO (B), who are each responsible for a different task.¹³ The tax manager is responsible for engaging in tax-planning activities $a_0 \in \{a_0^L, a_0^H\}$ and provides either high or low effort for this task at stage $\tau = 1$. The tax manager's effort costs¹⁴ are given by $\gamma(a_0, \cdot)$, where we assume $\gamma(a_0^H, \cdot) = \gamma(\cdot)$ and $\gamma(a_0^L, \cdot) = 0$; that is, the tax manager incurs no effort costs if he exerts low (standard) effort for tax-planning activities.¹⁵ The idea that a tax manager's effort affects the tax-planning outcome is consistent with the manager fixed effect that Dyreng et al. (2010) observe and with the role of managerial ability in tax avoidance (Koester et al., 2016). Simultaneously, at $\tau = 1$, the CEO provides effort to generate earnings $a_1 \in \{a_1^L, a_1^H\}$. The respective effort costs are given by $\kappa(a_1, \cdot)$, where $\kappa(a_1^H, \cdot) = \kappa(\cdot)$ and $\kappa(a_1^L, \cdot) = 0$.

We see that in this setting, the agents provide effort towards tax planning and generating earnings simultaneously. The simultaneous execution of these two tasks reflects the daily operations of a firm. In any given year, the tax department is responsible for the task of tax planning, while at the same time the other departments perform the task of generating earnings. At the end of the fiscal year, the outcomes of both departments are observed. In the case of listed firms, for example, these outcomes are disclosed to the public in the form of information on the GAAP ETR and on the firm's earnings.¹⁶

At $\tau = 2$, the outcomes of tax planning and generating earnings are observed. The tax-planning activities can result in either a low tax rate $t = t_l$ for the company or in a high tax rate $t = t_h$. We model successful tax planning as a decrease in the effective tax rate from t_h to t_l . The tax manager's effort impacts the probability of the outcome of the tax-planning activity: if the tax manager exerts effort $a_0 = a_0^H$, the outcome of the tax-planning activity is favorable (i.e., $t = t_l$) with probability $p_1(\cdot)$.¹⁷ The probability $p_1(\cdot)$ is smaller than 1 because the outcome of tax-planning activities involving, e.g., certain holding structures or tax-optimized transfer-pricing regimes, is typically uncertain. We should note that aggressive tax strategies may not

¹³ Instead of a CEO, this role might be played by a CFO or a COO, depending on who is responsible for earnings within a firm. When a single manager performs the tasks of tax planning and generating earnings, the results are similar.

¹⁴ The effort costs associated with tax planning include all costs that organizing and restructuring entail, such as networking, organizing majorities, and convincing others.

¹⁵ In order to distinguish between firms with different characteristics with regard to the costs of tax planning, we introduce each cost as a function of various parameter values. To simplify the exposition, we summarize these parameters as (\cdot) and fill the respective argument later on, when we discuss potential applications of our model.

¹⁶ We analyze a potential sequence in the decisions later on.

¹⁷ Further down we provide a potential interpretation of our model in which the probability of success varies with firm characteristics.

be accepted by the tax authority and entail a risk of unfavorable tax settlements in a tax audit (e.g., Bauer and Klassen, 2014; Dyreng et al., 2014; Mills et al., 2010). If the tax manager exerts low effort (i.e., $a_0 = a_0^L$), the outcome of the tax-planning activity can still be favorable for the firm. In that case, the tax rate will be low with probability $p_0(\cdot) < p_1(\cdot)$, either because of favorable developments in the regulatory environment or because there are tax-planning opportunities that the firm can easily take advantage of. This results in the following likelihood structure for tax rates:

	Probability Low Tax Rate	Probability High Tax Rate
High Effort	Prob[$t = t_l a_0 = a_0^H$] = $p_1(\cdot)$,	Prob[$t = t_h a_0 = a_0^H$] = $1 - p_1(\cdot)$,
Low Effort	Prob[$t = t_l a_0 = a_0^L$] = $p_0(\cdot)$,	Prob[$t = t_h a_0 = a_0^L$] = $1 - p_0(\cdot)$.

The outcome of generating earnings is also observed at $\tau = 2$. This results in either high or low pre-tax earnings x ; that is, $x \in \{x^H, x^L\}$. Here, the CEO's effort choice has an impact on the probability of high earnings. Specifically, if the CEO exerts a_1^H , the probability of high earnings is q_1 . However, even if the CEO exerts low effort a_1^L , earnings can still be high with a positive probability q_0 , where $q_0 < q_1$. The rationale behind this specification is that earnings are also influenced by economic conditions and by the competitive environment in which the firm operates. Therefore, the firm may obtain high earnings even if the CEO exerts low effort; in this case, however, the probability is lower than it would be if high effort was exerted. This results in the following likelihood structure for earnings x :¹⁸

	Probability High Earnings	Probability Low Earnings
High Effort	Prob[$x = x^H a_1 = a_1^H$] = q_1 ,	Prob[$x = x^L a_1 = a_1^H$] = $1 - q_1$,
Low Effort	Prob[$x = x^H a_1 = a_1^L$] = q_0 ,	Prob[$x = x^L a_1 = a_1^L$] = $1 - q_0$.

The principal's payoff is given by net earnings; that is, earnings after taxes minus the costs of tax planning. Here, the tax base equals earnings minus the agents' wage payments, which means that the agents' compensation payments are tax deductible for the principal. The amount of

¹⁸ Our model thus separates operational risk (q_1) and tax risk ($p_1(\cdot)$) and assumes that these risks are not correlated. This is in line with the empirical observation that firms face different types of uncertainty (Stein and Stone, 2013). For example, firms increase their cash holdings to use them as a buffer for tax uncertainty (Hanlon et al., 2016). While controlling for general firm risk (q_1), Jacob et al. (2014) show that tax uncertainty ($p_1(\cdot)$) can delay large investments. In other words, firms face a tax risk (i.e., the risk of large unfavorable tax payments) in addition to general firm risk (Bauer and Klassen, 2014).

after-tax earnings x_{at} depends on the outcome of the tax-planning activity and the earnings outcome. The following realizations are possible: $x_{at} = \{x^H(1-t_l), x^L(1-t_l), x^H(1-t_h), x^L(1-t_h)\}$.

At the firm level, the principal incurs different types of costs that are associated with the tax-planning decision; these have been described in the previous section. The direct costs of tax planning k that are incurred, such as the costs for running a tax department, are likely to vary with, e.g., firm size, but are independent of the outcome (t_l or t_h) and of whether the firm engages in aggressive or standard tax planning activities. In contrast, whether reputational and political costs will be incurred depends on the outcome of the tax-planning activity. We assume that reputational costs $r(\cdot)$ and political costs $c(\cdot)$ will be incurred when the tax rate is low (t_l). The idea behind this assumption is that stakeholders can only observe the tax-planning outcome, t_l or t_h , but not the actual effort. In practice, the ETR is typically used as an observable measure of tax avoidance (Dyreng et al., 2008; Hanlon and Heitzman, 2010). For that reason, reputational and political costs are assumed to arise only when t_l is realized.

We impose no restrictions on the class of contracts. Hence, at $\tau = 0$, the principal proposes to the agents the wage profile $w^i = \{(w_l^H)^i, (w_l^L)^i, (w_h^H)^i, (w_h^L)^i\}$, $i = A, B$, where, for example, $(w_l^H)^A$ indicates the wage payment for the tax manager when the tax rate is low (t_l) and pre-tax earnings are high (x^H). Wages must be non-negative, because we impose constraints of limited liability. Also, all parties are assumed to be risk-neutral and there is no pre-contractual information asymmetry between the parties. The agents have no wealth and their reservation utilities equal zero.

3.2 First-best Solution

We provide as a benchmark the first-best solution, in which the principal can observe the agents' effort choices. If the agents provide the first-best effort level that the principal desires and their actions are observable, the principal pays them a compensation equal to their effort costs (and the monetary equivalent of a reservation utility, which is assumed to equal zero). The principal can motivate four combinations of effort, namely $(a_0, a_1) = \{(a_0^H, a_1^H), (a_0^H, a_1^L), (a_0^L, a_1^H), (a_0^L, a_1^L)\}$. We assume that the principal always prefers to motivate the generation of earnings independently of the tax-planning decision; that is, we assume that the principal prefers to motivate (a_0^H, a_1^H) over (a_0^H, a_1^L) and (a_0^L, a_1^H) over (a_0^L, a_1^L) . The condition that needs to apply for this

assumption to hold is given by $\kappa(\cdot) < (x^H - x^L)(q_1 - q_0)$. This condition indicates that the respective effort costs for the earnings task need to be sufficiently low compared to the difference in profits, that is, the potential to increase earnings, weighted by the difference in success probabilities.

Wage payments need to be non-negative due to the constraints of limited liability. As a consequence, the principal pays Agent A a wage equal to $\gamma(\cdot)$ and Agent B a wage equal to $\kappa(\cdot)$ if he provides effort level a_0^H or a_1^H , respectively, while the wage is zero for a_0^L (a_1^L). The principal's payoffs with and without providing an incentive for tax planning (and given that there is always an incentive for the generation of earnings) are:

$$\begin{aligned}\Pi_{HH}^* &= p_1(\cdot) [(1 - t_l) \{q_1 x^H + (1 - q_1)x^L - \gamma(\cdot) - \kappa(\cdot)\} - r(\cdot) - c(\cdot)] \\ &\quad + [1 - p_1(\cdot)](1 - t_h) \{q_1 x^H + (1 - q_1)x^L - \gamma(\cdot) - \kappa(\cdot)\} - k \text{ and} \\ \Pi_{LH}^* &= p_0(\cdot) [(1 - t_l) \{q_1 x^H + (1 - q_1)x^L - \kappa(\cdot)\} - r(\cdot) - c(\cdot)] \\ &\quad + [1 - p_0(\cdot)](1 - t_h) \{q_1 x^H + (1 - q_1)x^L - \kappa(\cdot)\} - k.\end{aligned}$$

To examine the principal's decision on tax planning, we compare the principal's payoff when she motivates the tax manager to provide effort (Π_{HH}^*) with the respective payoff when she does not motivate the tax manager to engage in aggressive tax planning (Π_{LH}^*), given that the CEO is always motivated to provide effort for the generation of earnings. The first-best case illustrates that this decision is not determined by direct costs k . We assume that direct costs are independent of how successful the tax-planning activity is and of the agent's effort, and are equivalently included in Π_{HH}^* and Π_{LH}^* . As a result, when we compare the respective equations, they cancel each other out and we omit them in further analyses. The following proposition summarizes the result.

Proposition 1 *If the choices of effort are observable, the principal prefers to motivate aggressive tax-planning activities, i.e., $\Pi_{HH}^* > \Pi_{LH}^*$, if the following condition is fulfilled:*

$$\begin{aligned}& \{[1 - p_1(\cdot)](1 - t_h) + p_1(\cdot)(1 - t_l)\}\gamma(\cdot) + [p_1(\cdot) - p_0(\cdot)][r(\cdot) + c(\cdot)] \\ & < [p_1(\cdot) - p_0(\cdot)](t_h - t_l) \{q_1 x^H + (1 - q_1)x^L - \kappa(\cdot)\}.\end{aligned}\tag{1}$$

Proof. See the Appendix. ■

The expression displays the following trade-off between costs and benefits: the right-hand side of expression (1) shows the benefits of tax planning, which are achieved with greater probability in the case of aggressive tax planning, as opposed to routine tax activities ($p_1(\cdot) - p_0(\cdot) > 0$). These benefits have two components. The first component is the effect of a reduced ETR, while the second component represents the expected earnings after the deduction of the wage costs for the generation of earnings. We note that in the first-best setting, due to the observability and contractibility of effort, wages are paid on the basis of the effort that the principal asks the CEO to invest and independently of the final outcome of these activities. The costs of aggressive tax planning on the left-hand side of expression (1) consist in the wage costs that compensate the tax manager's tax-planning effort and the political and reputational costs at the firm level. The latter arise whenever stakeholders observe a low tax rate t_l , because only then are they informed about successful tax avoidance. The tax manager needs to be compensated for his effort, which is observable in the first-best situation. Whenever the tax manager is mandated to engage in aggressive tax planning, he is compensated for the corresponding effort costs $\gamma(\cdot)$ in terms of their monetary equivalent. As wages are tax deductible and the outcome of aggressive tax planning is uncertain, the expected reduction in the entire tax load equals $\{[1 - p_1(\cdot)](t_h) + p_1(\cdot)(t_l)\}\gamma(\cdot)$. The wage costs of compensating the tax manager for engaging in aggressive tax planning are reduced by the corresponding amount. We note that the agents cannot extract any rents in the first-best setting. As a consequence, the overall profit of the firm is higher than in the second-best case. We use these insights as a reference point in our subsequent analyses.

3.3 Second-best Solution

3.3.1 Tax Planning and Generation of Earnings

We now turn to the more realistic case in which the principal cannot observe the agents' actions. We first analyze a setting in which the principal wants to motivate both agents to provide a high degree of effort. The tax manager is willing to exert high effort for tax-planning activities if the following incentive compatibility constraint is fulfilled:

$$p_1(\cdot)(w_l^x)^A + [1 - p_1(\cdot)](w_h^x)^A - \gamma(\cdot) \geq p_0(\cdot)(w_l^x)^A + [1 - p_0(\cdot)](w_h^x)^A. \quad (2)$$

In other words, when the tax manager expends high effort towards tax planning he can expect greater compensation than when he exerts low effort. The tax manager's compensation depends on the outcome of the tax-planning activities but not on the realization of earnings x ; that is, $(w_t^H)^A = (w_t^L)^A = (w_t^x)^A$ and $(w_h^H)^A = (w_h^L)^A = (w_h^x)^A$.¹⁹

The CEO is willing to exert high effort towards the generation of earnings if the following incentive compatibility constraint is fulfilled:

$$q_1(w_t^H)^B + (1 - q_1)(w_t^L)^B - \kappa(\cdot) \geq q_0(w_t^H)^B + (1 - q_0)(w_t^L)^B. \quad (3)$$

In other words, when the CEO expends a high degree of effort towards the generation of earnings, his expected compensation is greater than it is when he expends low effort. The CEO's compensation is tied to the earnings outcome but is independent of the tax rate; that is, $(w_t^H)^B = (w_h^H)^B = (w_t^x)^B$ and $(w_t^L)^B = (w_h^L)^B = (w_t^x)^B$. As a result of limited liability constraints, the left-hand sides of both incentive constraints need to be greater than or equal to zero. The principal maximizes her expected payoff, which is given by:

$$\begin{aligned} \Pi_{HH} = & p_1(\cdot) [(1 - t_l) \{q_1(x^H - (w_t^H)^B) + (1 - q_1)(x^L - (w_t^L)^B) - (w_t^x)^A\} - r(\cdot) - c(\cdot)] \\ & + [1 - p_1(\cdot)](1 - t_h) \{q_1(x^H - (w_t^H)^B) + (1 - q_1)(x^L - (w_t^L)^B) - (w_h^x)^A\}. \end{aligned}$$

The principal does not want to compensate the agents for low outcomes. For that reason, the principal sets $(w_h^x)^A = (w_t^L)^B = 0$. The agents' participation constraints are always satisfied when incentive compatibility and limited liability constraints are fulfilled. The following lemma characterizes the optimal contracts and the principal's expected payoff.

Lemma 1 *If the principal wants to motivate both agents simultaneously to provide high effort in fulfilling their tasks, the respective optimal wage schemes are*

$$\begin{aligned} (w_t^x)^A &= \frac{\gamma(\cdot)}{p_1(\cdot) - p_0(\cdot)}, & (w_h^x)^A &= 0, \\ (w_t^H)^B &= \frac{\kappa(\cdot)}{q_1 - q_0}, & (w_t^L)^B &= 0. \end{aligned}$$

¹⁹ See Schmitz (2005) for a similar structure. Moreover, the use of this performance measure is supported by empirical evidence (Armstrong et al., 2012; Crocker and Slemrod, 2005; Graham et al., 2014).

The principal's expected payoff is

$$\begin{aligned} \Pi_{HH}^\dagger &= \{[1 - p_1(\cdot)](1 - t_h) + p_1(\cdot)(1 - t_l)\} \left\{ q_1 x^H + (1 - q_1)x^L - \frac{q_1 \kappa(\cdot)}{q_1 - q_0} \right\} \\ &\quad - p_1(\cdot) \left\{ c(\cdot) + r(\cdot) + \frac{1 - t_l}{p_1(\cdot) - p_0(\cdot)} \gamma(\cdot) \right\}. \end{aligned} \quad (4)$$

Proof. See the Appendix. ■

3.3.2 Only Generation of Earnings

To find out whether tax planning is beneficial for the principal, we now turn to the setting in which the principal provides the tax manager only with incentives for standard effort towards tax planning, whereas the CEO is given incentives to provide high effort for the generation of earnings. The tax manager thus gets a compensation equal to zero. The CEO is willing to provide effort under the same conditions as in the previous setting, as the two agents act independently. Thus, the CEO is willing to exert high effort towards the generation of earnings if the incentive compatibility constraint in (3) is fulfilled and the CEO gets the compensation already described in Lemma 1. The principal maximizes her expected payoff, which is given by:

$$\begin{aligned} \Pi_{LH} &= p_0(\cdot) [(1 - t_l) \{q_1(x^H - (w_t^H)^B) + (1 - q_1)(x^L - (w_t^L)^B) - (w_t^x)^A\} - r(\cdot) - c(\cdot)] \\ &\quad + [1 - p_0(\cdot)](1 - t_h) \{q_1(x^H - (w_t^H)^B) + (1 - q_1)(x^L - (w_t^L)^B) - (w_h^x)^A\}. \end{aligned}$$

Note that the probability of a low tax rate, $p_0(\cdot)$, is still positive (although below $p_1(\cdot)$) and can lead to a situation that results in $t = t_l$, in which case the firm incurs both reputational and political costs. The following lemma summarizes the principal's expected payoff.

Lemma 2 *If the principal wants to motivate only the CEO (Agent B) to provide high effort for the task of generating earnings, the principal's expected payoff equals*

$$\Pi_{LH}^\dagger = \{[1 - p_0(\cdot)](1 - t_h) + p_0(\cdot)(1 - t_l)\} \left\{ q_1 x^H + (1 - q_1)x^L - \frac{q_1 \kappa(\cdot)}{q_1 - q_0} \right\} - p_0(\cdot)[r(\cdot) + c(\cdot)]. \quad (5)$$

Proof. See the Appendix. ■

3.3.3 The Advantageousness of Tax Planning

The comparison of the two cases that we analyzed in the previous subsections allows us to examine a firm's decision on whether to engage in aggressive tax-planning activities or not in more detail. The subsequent analysis identifies the exogenous parameters that influence these decisions and sheds light on the underlying trade-offs. The following proposition summarizes the result.

Proposition 2 *In a simultaneous setting, when effort choices are unobservable, the principal benefits from tax-planning activities, i.e., $\Pi_{HH}^\dagger > \Pi_{LH}^\dagger$, if the following condition is fulfilled:*

$$\begin{aligned} & \frac{p_1(\cdot)}{p_1(\cdot) - p_0(\cdot)}(1 - t_l)\gamma(\cdot) + [p_1(\cdot) - p_0(\cdot)][r(\cdot) + c(\cdot)] \\ < & [p_1(\cdot) - p_0(\cdot)](t_h - t_l) \left\{ q_1 \left[x^H - \frac{\kappa(\cdot)}{q_1 - q_0} \right] + (1 - q_1)x^L \right\}. \end{aligned} \quad (6)$$

Proof. See the Appendix. ■

The tax-planning decision is a function of the costs of tax planning, shown on the left-hand side of expression (6), and of the expected benefits of tax planning, shown on the right-hand side of the same expression; that is, of the increase in the probability of a low ETR ($p_1(\cdot) - p_0(\cdot)$) times the expected net tax savings. The expected net tax savings comprise the difference in ETRs in cases of successful and unsuccessful tax planning ($t_h - t_l$) and the tax base, which reflects the expected earnings net of the wage costs of generating earnings ($q_1 \cdot [x^H - \frac{\kappa(\cdot)}{q_1 - q_0}] + (1 - q_1) \cdot x^L$). As the costs of providing the CEO with incentives to exert high effort towards the generation of earnings are tax deductible, these costs affect the benefits of tax planning. However, the CEO is only paid positive wages when earnings are high. Concerning the costs of tax planning, the wage that is necessary to motivate the tax manager to engage in aggressive tax planning amounts to $\frac{\gamma(\cdot)}{p_1(\cdot) - p_0(\cdot)}$ whenever a low ETR is observed. High effort (which means aggressive tax planning) leads to a low ETR with probability $p_1(\cdot)$. The wage costs that are incurred for incentivizing the tax manager are reduced by the multiplier $(1 - t_l)$, because the tax manager's remuneration is tax deductible. Political and reputational costs can arise whenever a low ETR is observed. The likelihood of a low ETR increases whenever the firm opts to provide incentives for aggressive tax planning ($p_1(\cdot) - p_0(\cdot) > 0$).

These observations allow us to identify some of the factors that underlie potential between-firm differences. One of the factors that are related to the benefits of aggressive tax planning is

the increase in the probability of a low ETR. The reason for such an increase is the uncertainty about the outcome of tax-planning activities, which means that they will not necessarily lead to the desired results. The probability of success is related to the visibility of a firm. Some firms may face less scrutiny from the tax authorities, or stakeholders in general, than others. For example, the likelihood of obtaining the benefits of aggressive tax planning varies between firms, depending on their listing status (i.e., public or private), size, industry, and their relationship with the tax authorities.

A second factor is the magnitude of the benefit that a firm can expect from tax-planning activities; this is expressed as the difference in tax rates in our model. In other words, before a firm engages in tax-planning activities, it considers the extent to which its tax rate can be reduced; that is, the difference $t_h - t_l$. Some firms may require an enormous amount of effort to reduce their tax burden, whereas others have more obvious tax-saving opportunities. For example, multinational firms have easier access to cross-border profit-shifting opportunities, while purely domestic firms have fewer tax-planning opportunities (Dyreg and Lindsey, 2009; Rego, 2003).

Finally, these benefits are a function of the tax base, which, in our case, equals the expected pre-tax earnings after the wage costs of generating earnings. The influence of the wage costs $\frac{\kappa(\cdot)}{q_1 - q_0}$ is evident in inequality (6). Concerning the benefits of tax planning, a reduction in the wage costs of the CEO increases the tax base and consequently increases the benefits of tax planning. In that respect, firms with lower wage costs should be more willing to engage in aggressive tax planning. Because here we assume that control is delegated to professional management, this creates a situation of moral hazard. In such a situation, the stronger the effect of the high effort the CEO expends on the firm's pre-tax earnings (i.e., as $x^H - x^L$ increases), the greater the likelihood of tax planning. This *potential to increase earnings* does not depend only on the manager's effort but also on his skills, on firm-specific characteristics such as cost efficiency, and on industry specifics such as the level of competition. Consequently, one would expect that the positive association of profitability or product market power and tax-planning activities would lead to more intense tax avoidance in more profitable firms (e.g., Dyreg et al., 2008; Kubick et al., 2015; Rego, 2003).

Expression (6) also reveals that the costs of motivating the tax manager to engage in aggressive tax planning, reputational costs, and political costs matter. The higher the costs in any

single category, the less attractive aggressive tax planning will be. We assume that wage costs are similar with respect to the generation of earnings and to tax planning. However, depending on the severity of the underlying moral-hazard problem, they vary depending on a firm's ownership structures and the degree of separation between ownership and control. Different firms face different costs that are related to moral-hazard problems. Political and reputational costs also vary, depending on factors such as the amount of stakeholder pressure, the degree to which the owners identify with their firm, the volume of public orders, and the exposure to scrutiny from government agencies or the broader public. We show the applicability of the model to comparisons of different types of firms in Section 5.

3.4 Comparing the First-best and Second-best Settings

When we compare the first-best to the second-best situation, we observe that while in the second-best setting the agents can extract rents, in the first-best scenario they are unable to do so. In the second-best setting, these rents equal $R_A = \frac{p_0(\cdot)\gamma(\cdot)}{p_1(\cdot) - p_0(\cdot)}$ for agent A and $R_B = \frac{q_0\kappa(\cdot)}{q_1 - q_0}$ for agent B. The rents increase with the wage costs of aggressive tax planning $\frac{\gamma(\cdot)}{p_1(\cdot) - p_0(\cdot)}$ and of generating earnings $\frac{\kappa(\cdot)}{q_1 - q_0}$, respectively. The wage costs therefore become positively reflected in the utility of the respective agent who is in charge of the associated activity, i.e., either tax planning or the generation of earnings. Also, the firm's profit is reduced by

$$\begin{aligned} \Pi_{HH}^* - \Pi_{HH}^\dagger = & \{ [1 - p_1(\cdot)](1 - t_h) + p_1(\cdot)(1 - t_l) \} [R_A + R_B] \\ & + \frac{p_1(\cdot)[1 - p_1(\cdot)](t_h - t_l)}{p_0(\cdot)} R_A, \end{aligned} \quad (7)$$

if the second-best scenario applies instead of the first-best. Expression 7 linearly increases in the rents extracted by both agents and reflects the incentivization costs that a firm has to bear when the agents' efforts are unobservable. These costs increase with the agents' wage costs and, correspondingly, with the agents' effort costs. Generally, more serious moral-hazard problems translate into higher incentivization costs for firms.

Comparing expressions (1) and (6) reveals that the rents the two agents can extract in the second-best setting not only affect the firm's profit negatively, but at the same time make aggressive tax planning less attractive. The right-hand side in expression (1) minus the right-hand side in expression (6) yields the rent extracted by agent B times $(t_h - t_l)[p_1(\cdot) - p_0(\cdot)]$.

The left-hand side in expression (1) minus the left-hand side in expression (6) yields the rent extracted by agent A times $-\{[1-p_1(\cdot)](1-t_h)+p_1(1-t_l)+\frac{p_1(\cdot)[1-p_1(\cdot)](t_h-t_l)}{p_0}\}$. Therefore, tax planning is more attractive in the first-best than in the second-best situation and the relative advantages increase with both agents' wage costs and therefore also with the rents that they can extract.

Interestingly, the results that our model endogenously yields are the opposite of what one might expect if better opportunities for tax avoidance enable managers to divert more rents, as Desai and Dharmapala (2006, 2009a,b) argue. Specifically, our model shows that greater opportunities for rent diversion make tax avoidance less attractive, which suggests that the relationship between these two factors is substitutional rather than complementary, as they hypothesized. We should add that our approach is somewhat different from theirs: Desai and Dharmapala (2006) assume that tax avoidance opens up opportunities for the diversion of rents in the first place and did not endogenously solve the underlying moral-hazard problem. In our approach, the existence of moral hazard and therefore of opportunities for rent diversion makes tax avoidance less attractive. More specifically, we argue that a firm may need to increase compensation as an incentive in order to reduce the problems of moral hazard it faces and that this increase should be proportional to the severity of moral hazard. As a consequence, tax avoidance becomes less attractive.

4 Sequential Setting

Another possibility is that the relation between tax-planning activities and the generation of earnings is sequential. For example, according to the logic of the canonical tax-planning approach, which textbooks (such as that by Scholes et al. (2014)) recommend, the tax-planning decision might precede the generation of earnings. In this case, the outcome of the tax-planning activity can be observed and the incentives for generating earnings can be made contingent on the outcome of the tax-planning activity. This might apply in a setting where investment decisions are made after tax planning. For example, if a firm has successfully established a tax-planning tool such as the Dutch-Irish Sandwich, effort towards the generation of earnings is expended after the successful implementation of this tool.

The generation of earnings might also precede the tax-planning decision (e.g., Chen and Chu, 2005; Crocker and Slemrod, 2005; Desai and Dharmapala, 2006). For instance, tax accounts

are typically among the last accounts to close before earnings announcements, because of the length of the time it takes to complete IRS audits (Dhaliwal et al., 2004). This, however, is simply a special case of the simultaneous setting, which yields similar results. We discuss this case in Appendix B. In the following, we therefore focus on cases in which tax planning precedes the generation of earnings.

4.1 Tax Planning Precedes the Generation of Earnings

We now turn to a setting in which a firm decides on what incentives to provide for the generation of earnings after the outcome of the tax-planning activity has been observed. The timing of events in this setting is as follows:

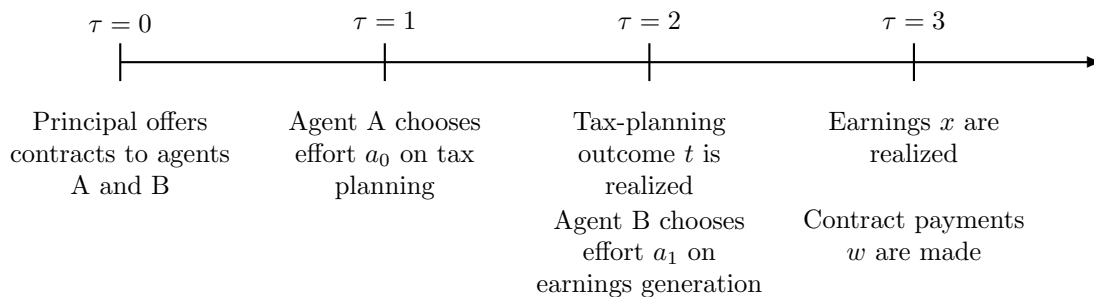


Figure 2: Timeline Sequential Setting

As a consequence, the principal can decide whether to motivate the CEO to exert high effort towards the generation of earnings depending on the outcome of the tax-planning activity. We first analyze a situation in which the principal always wants the tax manager to expend high effort towards tax-planning activities. Moreover, we assume that the principal motivates the CEO to exert high effort towards the generation of earnings only if the outcome of the tax-planning activity is favorable, i.e., if $t = t_l$. The general structure of the agents' wages is not affected by this decision, because the principal motivates the two agents independently of each other. The principal maximizes her ex-ante expected payoff

$$\begin{aligned} \Pi_{HL(t_h)H(t_l)} = & p_1(\cdot) [(1 - t_l) \{q_1(x^H - (w_l^H)^B) + (1 - q_1)(x^L - (w_l^L)^B) - (w_l^x)^A\} - r(\cdot) - c(\cdot)] \\ & + [1 - p_1(\cdot)](1 - t_h) \{q_0(x^H - (w_h^H)^B) + (1 - q_0)(x^L - (w_h^L)^B) - (w_h^x)^A\}. \end{aligned}$$

The following lemma summarizes the agents' wages and the principal's expected payoff.

Lemma 3 *Let us assume that the principal always wants the tax manager to exert high effort towards tax-planning activities. The tax manager's wage scheme is thus identical to the one described in Lemma 1. If the principal motivates the CEO to exert high effort towards the generation of earnings only if $t = t_l$, the respective optimal wage scheme is*

$$(w_l^H)^B = \frac{\kappa(\cdot)}{q_1 - q_0}, \quad (w_l^L)^B = (w_h^H)^B = (w_h^L)^B = 0.$$

The principal's expected payoff is

$$\begin{aligned} \Pi_{HL(t_h)H(t_l)}^\dagger &= p_1(\cdot)(1 - t_l) \{q_1 x^H + (1 - q_1)x^L\} + [1 - p_1(\cdot)](1 - t_h) \{q_0 x^H + (1 - q_0)x^L\} \\ &\quad - p_1(\cdot) \left[r(\cdot) + c(\cdot) + \frac{(1 - t_l)q_1}{q_1 - q_0} \kappa(\cdot) + \frac{(1 - t_l)}{p_1(\cdot) - p_0(\cdot)} \gamma(\cdot) \right]. \end{aligned} \quad (8)$$

Proof. See the Appendix. ■

To see whether in this setting the tax-planning activity is beneficial from the principal's point of view, we compare it to a setting we use for reference, in which the principal does not motivate the tax manager to engage in aggressive tax planning, whereas the CEO has the same incentives as in the previous setting. The principal then maximizes the following payoff:

$$\begin{aligned} \Pi_{LL(t_h)H(t_l)} &= p_0(\cdot) \left[(1 - t_l) \{q_1(x^H - (w_l^H)^B) + (1 - q_1)(x^L - (w_l^L)^B) - (w_l^x)^A\} - r(\cdot) - c(\cdot) \right] \\ &\quad + [1 - p_0(\cdot)](1 - t_h) \{q_0(x^H - (w_h^H)^B) + (1 - q_0)(x^L - (w_h^L)^B) - (w_h^x)^A\}. \end{aligned}$$

The principal chooses a wage equal to zero for the tax manager and the same wage structure for the CEO as in Lemma 3. The following lemma characterizes the principal's payoff.

Lemma 4 *Let us assume that the principal does not motivate the tax manager to provide high effort for tax planning. If the principal motivates the CEO to exert high effort towards generating earnings only if $t = t_l$, her expected payoff is*

$$\begin{aligned} \Pi_{LL(t_h)H(t_l)}^\dagger &= p_0(\cdot)(1 - t_l) \{q_1 x^H + (1 - q_1)x^L\} + [1 - p_0(\cdot)](1 - t_h) \{q_0 x^H + (1 - q_0)x^L\} \\ &\quad - p_0(\cdot) \left[r(\cdot) + c(\cdot) - \frac{q_1(1 - t_l)}{q_1 - q_0} \kappa(\cdot) \right]. \end{aligned} \quad (9)$$

Proof. See the Appendix. ■

To assess whether tax planning is beneficial from the firm's perspective if the incentives for the generation of earnings are contingent on the success of the tax-planning activity, we compare the principal's payoffs given in Lemmas 3 and 4. The following proposition summarizes the result.

Proposition 3 *In a sequential setting with unobservable effort choices, when the incentives for the generation of earnings are made contingent on the outcome of the tax-planning activity, the principal benefits from such activities, i.e., $\Pi_{HL(t_h)H(t_l)}^\dagger > \Pi_{LL(t_h)H(t_l)}^\dagger$, if the following condition is fulfilled:*

$$\begin{aligned} & \frac{p_1(\cdot)}{p_1(\cdot) - p_0(\cdot)}(1 - t_l)\gamma(\cdot) + [p_1(\cdot) - p_0(\cdot)][r(\cdot) + c(\cdot)] \\ < & [p_1(\cdot) - p_0(\cdot)]\left\{q_1(1 - t_l)\left[x^H - \frac{\kappa(\cdot)}{q_1 - q_0}\right] - q_0(1 - t_h)x^H \right. \\ & \left. + [(1 - q_1)(1 - t_l) - (1 - q_0)(1 - t_h)]x^L\right\}. \end{aligned} \quad (10)$$

Proof. See the Appendix. ■

The condition in expression (10) can be interpreted as follows. The left-hand side is the sum of the agent-level and firm-level costs of tax planning. The wage costs of the tax manager are weighted with $(1 - t_l)$ because they are tax deductible and with $p_1(\cdot)$ because the compensation is only paid when the tax rate is low. The effect of reputational and political costs is the same as in the simultaneous setting.

However, there are differences between the simultaneous and the sequential setting in the benefits of tax planning as the right-hand side of inequality (10) shows. As in the simultaneous setting, in this setting too, $[p_1(\cdot) - p_0(\cdot)]$ represents the increase in the probability that a low ETR will result when the firm decides to engage in aggressive tax planning. However, the weighted benefits of tax planning can now be quantified for two distinct situations, represented by the three summands in curly brackets.

The first two summands express the expected net benefit of tax planning if high earnings are subsequently realized. If tax planning is successful, the probability of high earnings is q_1 , because there will be incentives for high effort for the generation of earnings. The corresponding after-tax earnings equal $q_1(1 - t_l)\left[x^H - \frac{\kappa(\cdot)}{q_1 - q_0}\right]$. However, if tax planning is unsuccessful and a high ETR is the result, then the agent exerts only low effort towards the generation of earnings. The corresponding probability of high earnings is q_0 . At the same time, expected after-tax earnings equal $q_0(1 - t_h)x^H$.

The third summand captures the opposite situation, in which low earnings are realized at the second stage, and expresses the expected benefit of tax planning in those cases. When (either routine or aggressive) tax-planning activity at the first stages leads to a high ETR, low earnings at the second stage are more likely compared to the case when a low ETR is realized at the first stage ($(1 - q_0) - (1 - q_1) > 0$). If tax planning is successful and the subsequent provision of incentives to exert high effort towards generating earnings is unsuccessful, the earnings after taxes equal $x^L \cdot (1 - t_l)$. If tax planning at the first stage results in a high ETR and the provision of incentives at the second stage is unsuccessful, earnings after tax are $x^L \cdot (1 - t_h)$. Note that the third summand is always smaller than the sum of the first and second ones and can even become negative.²⁰ In this case, aggressive tax planning becomes less attractive and can even become unattractive to firms because it leads to lower expected after-tax profit than standard tax-planning activities do.

The decision to engage in aggressive tax planning boils down to a cost-benefit comparison, which is not trivial. It is a function of (1) the cost of the wages paid to the tax manager to engage in aggressive tax planning, (2) the cost of the wages paid to the CEO so that he exerts high effort towards the generation of earnings, (3) the increase in expected reputational and political costs, and (4) the potential to increase earnings through exerting high effort. Overall, the analysis of a setting in which tax planning precedes the generation of earnings and where the incentives for generating earnings depend on the previously realized tax rate supports the conclusions we drew from the case in which the managers make their decisions simultaneously. Our model also implies that the separation of ownership from control affects the tax planning decision in addition to the reputational and political costs of tax planning. In particular, the costs of providing appropriate incentives to managers directly affect a firms' tax-planning decisions. We find that aggressive tax-planning activities are less likely in firms where there are high costs for providing incentives to the top management—i.e., the CEO—so that he exerts high effort towards the generation of earnings. The same applies when the costs of the wages paid to the tax manager so that he engages in aggressive tax planning are high.

²⁰ The sum of the first and second summand is always larger than zero. This indicates that aggressive tax planning is more appealing also in this scenario whenever high profits are expected at the second stage.

4.2 The Determinants of the Tax-planning Decision

On the basis of our analysis so far, we now examine under which conditions it is optimal for a firm to engage in tax planning before generating earnings and under which conditions it chooses the simultaneous setting.²¹ The analysis shows that choosing a sequential motivation of tax planning and generating earnings can in fact be beneficial for the firm in the sense that it leads to higher expected after-tax profits. We also draw on the previous analysis of the conditions under which it is or is not optimal for a firm to engage in aggressive tax-planning activities. For that reason, we also include the reference cases for the simultaneous and the sequential setting, in which the firm does not engage in aggressive tax planning.

First, we compare the principal's payoff in the four cases presented in Lemmas 1 to 4 by varying incentivization costs and firm-level costs. The firm incurs costs for providing incentives to the two agents so that each expends effort towards his task. These translate into incentivization costs, which are calculated as the difference between the principal's payoffs in the first-best and in the second-best setting.²² These costs increase linearly with both agents' rents, which, again, increase linearly with both agents' effort costs. The incentivization costs thus equal zero if the effort costs are zero. Firm-level costs represent the sum of political and reputational costs incurred for successful tax planning.

Second, we show that our results depend on the firm's potential to increase earnings, i.e., $\Delta x = x^H - x^L$. This is because the incentivization costs have a smaller influence on decision-making when the potential gains from motivating the CEO are high, i.e., Δx is large. Given that this effect is related only to agent-level costs and does not alter the effect of firm-level costs, this might explain cross-sectional differences in tax planning.²³

Figure 3 depicts the principal's payoff in the four cases described in Lemmas 1 to 4 for the following parameter values: $x^H = 100$, $t_h = 0.35$, $t_l = 0.1$, $p_1(\cdot) = 0.9$, $p_0(\cdot) = 0.1$, $q_1 = 0.8$, and

²¹ It should be noted that due to the separation of tasks the principal can replicate the results of the simultaneous setting by applying a sequential setting in which there are always incentives for the generation of earnings, independently of the tax-planning outcome.

²² Expression 7 reports the incentivization costs for the simultaneous setting with tax planning. The incentivization costs for the sequential setting and the reference settings are calculated accordingly.

²³ By contrast, the difference $\Delta t = t_h - t_l$, which could be interpreted as the potential to decrease ETRs, relativizes the agent-level and firm-level costs. The larger the difference, the more attractive the option of aggressive tax planning. This insight applies to all types of firms, however, so it does not explain cross-sectional differences.

$q_0 = 0.3$.²⁴ In part I (low potential to increase earnings) we use $x^L = 90$ and in part II (high potential to increase earnings) we use $x^L = 10$. The incentivization costs and firm-level costs range between 0 and 12. The gray areas represent aggressive tax planning, the white areas represent standard tax-planning activities. The sequential settings are identified by dotted areas.

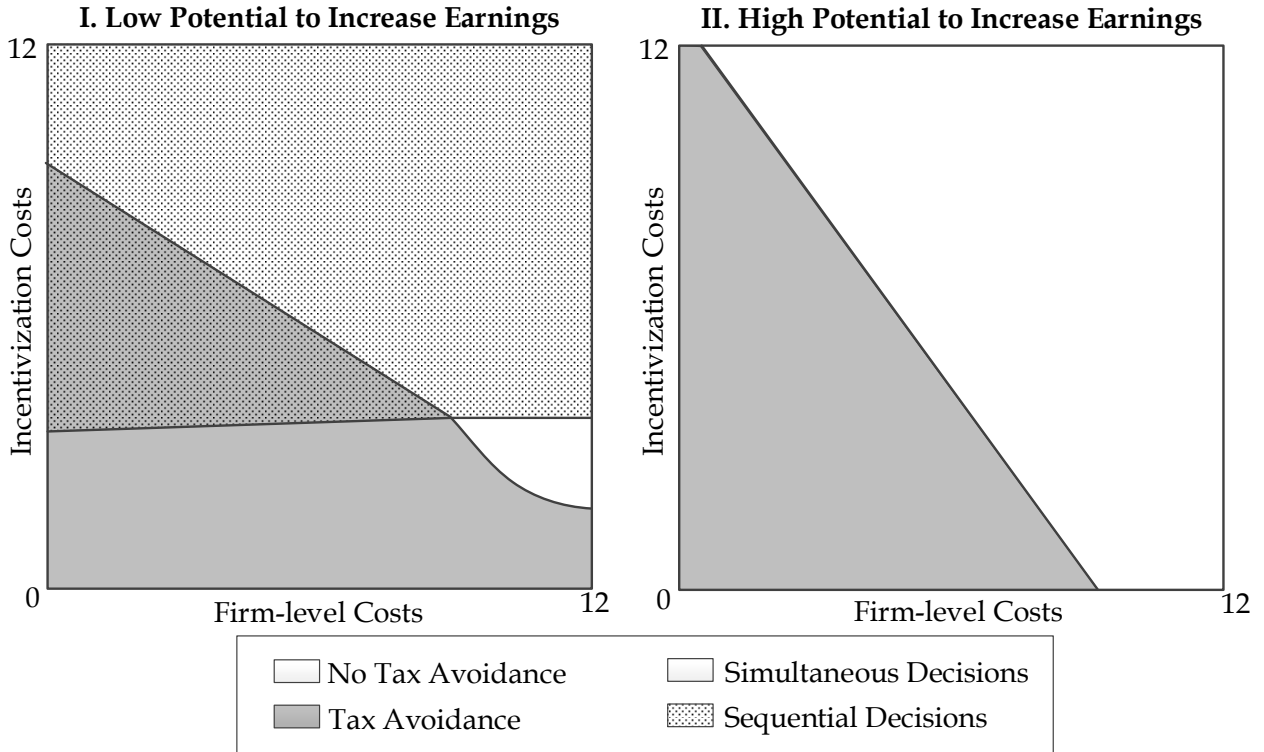


Figure 3: Comparison of Cases

Intuitively, Figure 3 shows that the lower the incentivization and the firm-level costs, the greater the likelihood that a firm will engage in aggressive tax planning. It also shows that when the potential to increase earnings is low (part I) and the incentivization costs are high, the principal benefits from the option of conditioning the incentives for the generation of earnings on the tax-planning outcome and thus prefers the sequential setting because of higher payoffs. The sequential setting entails lower incentivization costs, because the principal motivates the CEO selectively to provide high effort only if the respective benefits exceed the associated incentivization costs. This argument applies particularly in cases where the potential to increase earnings

²⁴ The tax rates used for the numerical example are close to the 25th percentile and the 75th percentile of the one-year cash-effective tax rate distribution from the sample of listed U.S. firms that Dyreng et al. (2008) use.

is low, which lowers the firm's benefits and therefore increases the importance of incentivization costs. In such cases it is more likely that the benefits exceed the costs when $t = t_l$. When the potential to increase earnings is high (part II), the principal always motivates both efforts simultaneously, regardless of incentivization costs, because the benefits are always sufficient to cover the costs.²⁵ In this case, there is no disadvantage for the principal in committing ex ante to provide both agents with incentives so that they exert high effort.

5 Tax Planning in Different Types of Firms

5.1 Cross-sectional Differences in Tax Avoidance

The objective of this section is to demonstrate how our model can be applied to derive testable hypotheses. For that purpose, we relate our model to specific firm characteristics. As we outlined in Section 2, the agent-level and firm-level costs of tax planning vary between different types of firms. Here, we compare private and public firms, family and non-family firms, and firms that combine both categories of characteristics.

5.1.1 Public versus Private Firms

When we hold firm size and other characteristics (such as internationalization) constant, a number of other factors can lead to differences in tax-planning behavior between public and private firms. The first of these factors is mandatory disclosure. Hope et al. (2013), for example, show that disclosing information about the geographic distribution of earnings limits a firm's ability to hide foreign profits. In other words, avoiding taxes is harder for firms required to disclose substantial amounts of information to the public, because the tax authority will have a more precise idea of those firms' geographic distribution of earnings.²⁶ As a consequence, the probability that tax planning will be successful is higher when the level of mandatory disclosure is relatively low. In the context of our model, this implies that the success of tax planning

²⁵ We note that, ex ante, the sequential setting, in which the generation of earnings precedes tax planning (see Appendix B), can never be more favorable for a firm than the simultaneous setting. Because the outcome of the effort exerted towards generating earnings is uncertain, the two settings are equivalent. Therefore, deciding how to time tax planning boils down to a comparison between the simultaneous setting and the setting where tax planning precedes the generation of earnings.

²⁶ Similarly, Mills (1998) show that large reported book-tax differences are associated with greater proposed audit adjustments by the Internal Revenue Service. However, Mills and Sansing (2000) find no association between book-tax differences and retained audit adjustments. Frank et al. (2009) provide evidence that aggressive financial reporting and aggressive tax reporting are nevertheless positively correlated. Badertscher et al. (2009) show that book-tax differences reflect trade-offs between tax benefits and detection costs.

depends on the listing status s of a firm, i.e., $p_1(s)$ and $p_0(s)$, where higher s is associated with private firms.²⁷ We thus conclude that the probability of success is higher for private firms than for public firms, i.e., $\frac{dp_1(s)}{ds} > \frac{dp_0(s)}{ds} > 0$.

A second factor associated with a firm’s potential political and reputational costs is greater exposure to public scrutiny; for example through the disclosure of balance-sheet information. Dyreng et al. (2016) provide empirical evidence on the relation between exposure to public scrutiny and the magnitude of political and reputational costs. The authors observe that many firms in their sample had tried to avoid tax-related scrutiny²⁸ and that public pressure had led firms that had come under greater scrutiny to increase their tax expenses. Dyreng et al. (2016) stress that not all firms are equally sensitive to the repercussions of political and reputational costs and argue that they are higher for public than for private firms, i.e., $\frac{\partial c(s, \cdot)}{\partial s} < 0$ and $\frac{\partial r(s, \cdot)}{\partial s} < 0$. This conclusion is supported by evidence from Graham et al. (2014), who find that public firms are more likely to perceive “potential harm to reputation” and “adverse media attention” as a deterrent for tax avoidance than private firms. Independently of the listing status, reputational and political costs are assumed to vary with the ETR. In line with empirical studies (Dyreng et al., 2008, e.g.,) we conjecture that lower observed ETRs are associated with more aggressive tax-planning activities and thus higher political and reputational costs, i.e., $\frac{\partial c(s, t), \partial r(s, t, \cdot)}{\partial t} < 0$.

The third factor is the degree of ownership concentration and the extent of overlap between ownership and management in a firm which are greater in private firms than in public firms, so we expect incentivization costs are lower for private than for public firms, i.e., $\frac{\partial \kappa(s, \cdot), \partial \gamma(s, \cdot)}{\partial s} < 0$. Taken together, these three factors suggest that, overall, private firms are more likely to engage in tax avoidance than public firms, because (1) the probability of successful tax avoidance is higher for such firms, (2) the political and reputational costs they might face are lower, and (3) the incentivization costs for engaging in tax avoidance and the generation of earnings are lower. In sum, all effects point in the same direction and we would expect private firms to be more tax aggressive than public firms.

²⁷ We model a continuum of private/public because firms can have publicly traded equity and/or debt. Put differently, there are firms who are not listed (fully private), firms with publicly traded debt but private equity, or firms for which both, debt and equity are traded (fully public).

²⁸ Hasegawa et al. (2013) make a similar observation and derive similar conclusions.

5.1.2 Family versus Non-family Firms

Differences between the tax-planning decisions of family firms and non-family firms are also likely for a number of reasons. First, reputational costs depend on the family status m of a firm, i.e., on whether a firm is a family or a non-family firm. Higher values of m are associated with family firms.²⁹ Compared to non-family firms, the members of family firms have closer ties to each other and to the firm. These ties stem from socioemotional factors—a phenomenon that has been recently described as the “socioemotional wealth” of family firms (Gómez-Mejía et al., 2007, p. 106). These factors include adherence to family values as the fulfillment of basic needs, such as the need to belong, the need for affection and intimacy, the need to maintain good family and business relationships, and the need to preserve one’s status, power, social capital, and prestige (Gómez-Mejía et al., 2007). This is why owners who are bound to each other by family ties tend to identify strongly with their firm (Dyer Jr. and Whetten, 2006; Kets de Vries, 1993). Such ties create a natural overlap between an individual’s identity and the identity of the organization (Foreman and Whetten, 2002). Consequently, if the organization’s reputation is tarnished, the personal reputation of the family members who own it also suffers, which is why family firms tend to avoid becoming involved in anything that could cost them their reputation (Gómez-Mejía et al., 2011).

For the reasons described above, family firms generally tend to be more socially responsible than non-family firms (Dyer Jr. and Whetten, 2006). Given that aggressive tax planning can lead to negative publicity and harm a firm’s reputation (Bankman, 2004), we assume that the reasoning we explained above also applies to the decision to engage in or refrain from aggressive tax avoidance (Chen et al., 2010). Consequently, we can also assume that family firms face higher reputational costs than non-family firms, i.e., $\frac{\partial r(s, t, m)}{\partial m} > 0$.

A second difference between family firms and non-family firms has to do with the degree of ownership concentration and the extent to which ownership overlaps with management. Concentrated ownership mitigates problems of moral hazard, because less diversified owners with larger stockholdings have stronger incentives to monitor management closely (Berle and Means, 1932; Francis and Smith, 1995; Shleifer and Vishny, 1997). Furthermore, a greater overlap between ownership and management means less delegation and thus less severe problems of moral hazard (Ang et al., 2000; Fama and Jensen, 1983; Jensen and Meckling, 1976). The

²⁹ We model family firms as a continuum following the approach in Astrachan et al. (2002).

greater the degree of ownership concentration and the greater the degree of overlap between ownership and management, the lower the incentivization costs. Both of these characteristics are more pronounced in family firms than in non-family firms (Chrisman et al., 2004; Villalonga and Amit, 2006). Hence, we argue that family firms face lower incentivization costs than non-family firms, i.e., $\frac{\partial \kappa(s, m), \partial \gamma(s, m)}{\partial m} < 0$.

In contrast to the differences between public and private firms with respect to the relation between costs and tax avoidance, the differences between family and non-family firms are less straightforward. The lower incentivization costs that family firms typically incur favor an increase in tax-planning activities (e.g., Chen et al., 2010). At the same time, however, family firms face higher reputational costs, which, all else being equal, lead to higher overall costs on the firm level. Taking all these factors into account, we expect that the combinations of parameter values that typically represent family firms are located in the lower right corner of the two coordinate systems depicted in Figure 4. In contrast, the combinations of parameter values that represent non-family firms are typically located in the upper left corner of Figure 4.

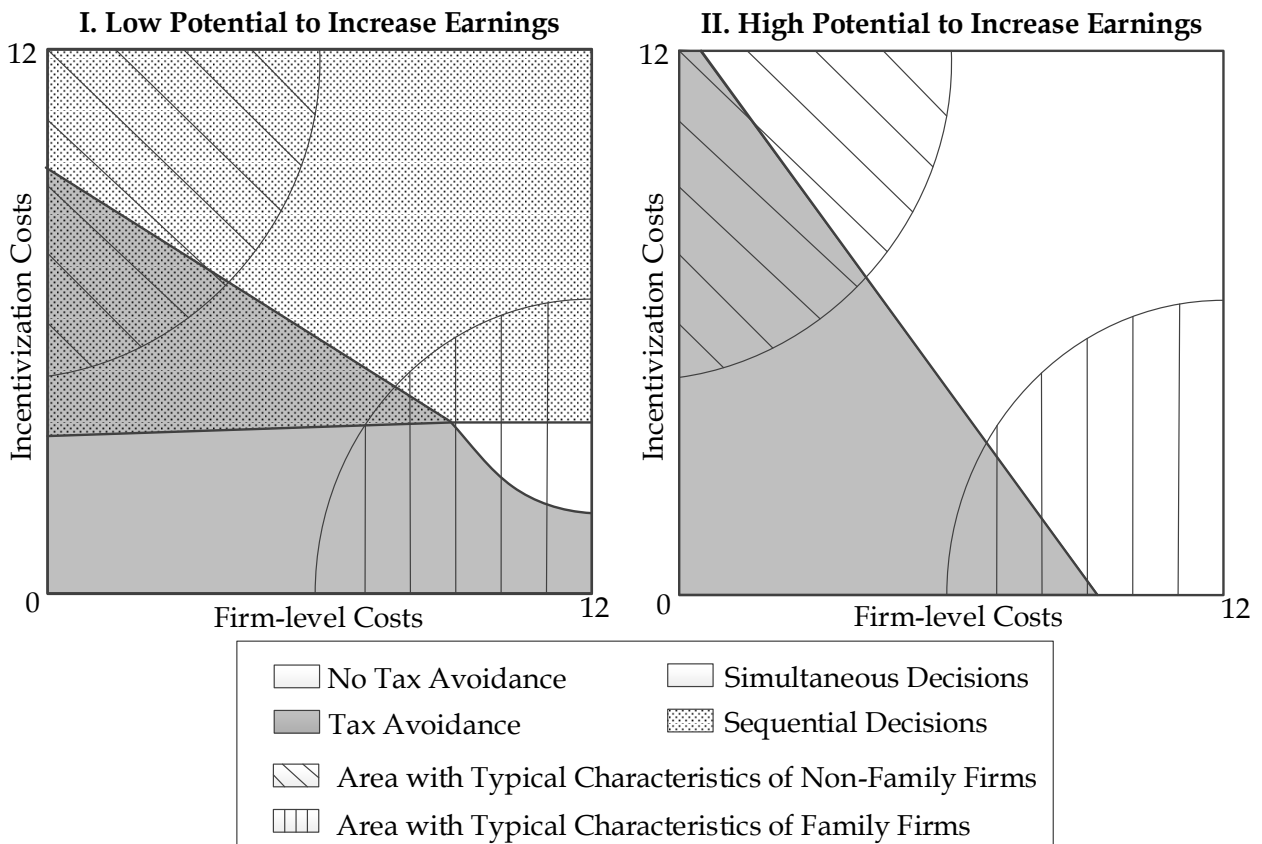


Figure 4: Tax Avoidance of Family vs. Non-family Firms

The figure illustrates that cross-sectional differences in tax avoidance can stem from three factors: (1) Incentivization costs, which make family firms *more* likely to engage in tax planning than non-family firms, (2) firm-level costs, which make family firms *less* likely to engage in tax planning than non-family firms, and (3) the potential to increase earnings. It turns out that the last factor, the potential to increase earnings, determines which of the two previous factors is dominant in a firm's decision to engage in or refrain from aggressive tax planning.

Family firms are more likely to engage in tax avoidance when the potential to increase earnings is low (part I in Figure 4) than when it is high (part II). In Figure 4, this is illustrated by the decreasing size of the gray-shaded areas in the lower right corner as one progresses from I to II. That is, when the potential to increase earnings is low, low incentivization costs make aggressive tax planning less costly and therefore more attractive to family firms. However, if the potential to increase earnings is high, incentivization costs seem to influence less the decision on whether to engage in aggressive tax planning or not. As a result, the costs at the firm level make it less likely that a family firm engages in aggressive tax planning. In the case of non-family firms, the reverse argument applies.

From this within-firm type comparison an important cross-sectional observation emerges: when the potential to increase earnings is low, family firms are more likely to avoid taxes than non-family firms, as the size of the gray-shaded areas in the two corners of part I in Figure 4 shows. In this case, lower incentivization costs seem to be the driving factor for the decision to engage in aggressive tax planning. In contrast, when the potential to increase earnings is high, the threat of reputational damage can outweigh the advantage of lower incentivization costs. In this case, family firms are less likely to engage in tax planning than non-family firms, as the size of the gray-shaded areas in both corners of part II in Figure 4 shows. For family firms, when the potential to increase earnings is high, the advantage of lower incentivization costs becomes less important, while the effect of the reputational costs remains unaltered.

The main empirical prediction we can derive from our model is that tax planning depends on the interaction of the following three factors: (1) firm-level costs, (2) incentivization costs at the agent-level, and (3) the potential to increase earnings. This prediction applies unambiguously to firms with higher firm-level and agent-level costs compared to firms where these costs are lower. In this scenario, the firm that faces lower costs is more likely to avoid paying taxes. However, if a firm has low agent-level costs but high firm-level costs, it is more likely to avoid

taxes only if the potential to increase earnings is low. When the potential to increase earnings is high, firms with high agent-level costs and lower firm-level costs are more likely to avoid paying taxes.

When we combine listing status and family status in our analysis, effects overlap. Table 1 shows how the probability of successful tax planning and the firm-level and agent-level costs depend on the two characteristics of public vs private firms and family vs non-family firms.

	Family Firm	Non-Family Firm
Public	Lower success probability High reputational costs High political costs Medium incentivization costs	Lower success probability Medium reputational costs High political costs High incentivization costs
Private	Higher success probability Medium reputational costs Low political costs Low incentivization costs	Higher success probability Low reputational costs Low political costs Medium incentivization costs

Table 1: Firm Characteristics and Costs

If the potential to increase earnings is low, that is, incentivization costs drive the tax-planning decision, we would expect private family firms to be the most aggressive tax planners because they face the lowest incentivization costs (remember that incentivization costs are lower for family firms than for non-family firms and also lower for private firms than for public firms). Public non-family firms, however, face high incentivization costs and are thus not likely to engage in aggressive tax-planning activities. In addition, firm-level costs are lower for private than for public firms, which again shifts the previously described trade-off into the direction that private family firms engage in more aggressive tax planning than public non-family firms.

The prediction is less clear for private non-family firms and public family firms. Private non-family firms face unambiguously lower firm-level costs. However, the impact of firm characteristics on the level of incentivization costs in these two categories is not clear: private firms have lower incentivization costs than public firms, but family firms have lower incentivization costs than non-family firms. If incentivization costs were on average comparable, our prediction would be that private non-family firms are more aggressive tax planners than public family firms because of the lower firm-level costs. However, in individual cases, a public family firm may face lower incentivization costs than a private non-family firm, which can lead the public family firm to engage in more tax planning than the private non-family firm.

If the potential to increase earnings is high, that is, firm-level costs drive the tax-planning decision, we would expect public family firms to be among the firms with only standard tax planning activities, because they face high reputational and political costs.³⁰ Private non-family firms should be among the most aggressive tax planners, because of low reputational and political costs. In this case, the prediction for public non-family firms and private family firms is less clear and will depend on the relative importance of reputational and political costs in these types of firms. However, since private family firms face unambiguously lower incentivization costs, this could potentially lead them to be more aggressive tax planners, if firm-level costs were comparable.

5.2 Limitations

The theoretical model we applied to various types of firms that display particular characteristics goes some way towards explaining why not all firms engage in tax avoidance to the same extent. Our model relies on certain assumptions, some of which concern the relationship between specific firm characteristics and cost parameters, which are described in Table 1. In our view, these assumptions are well grounded in empirical and anecdotal evidence; nevertheless, our analysis has several limitations.

The first limitation has to do with the binary structure of our model. Specifically, outcomes x and t and effort choices a_0 and a_1 can each assume two different states or values. This binary structure potentially limits the explanatory power of the model. As an alternative, one might consider a model with continuous outcomes and efforts, such as the Linear Exponential Normal (LEN) model. However, we chose a binary structure over this alternative because in the latter case the compensation would have to be explicitly tied to the outcome. Further, the binary structure allowed us to derive simple analytical solutions that are sufficient to illustrate the desired effects.

The second limitation of our model is that we do not model a hierarchical structure among the two agents. Future research could analyze how a potential hierarchy between the agents, for example, that the tax manager directly reports to the CEO and the CEO is ultimately respon-

³⁰ We do not explicitly analyze the differences in success probabilities, because they vary according to the disclosure requirements a firm faces and point into the same direction as political costs do.

sible for both outcomes, the tax rate and the earnings figure, impacts the agents' incentives to provide effort and the firm's tax-planning decision.

The third limitation stems from our decision to model a one-period setting, that is, to examine a particular point in time at which the firm decides whether to provide incentives for tax planning and generating earnings and, if so, how and in what order. A possible difficulty with this choice is that tax-planning decisions often involve a long-term orientation and cannot be easily reversed (an example of such decisions might be the implementation of a transfer-pricing system). Therefore, considering a repeated game in a multi-period setting might be a worthwhile extension that future studies might consider.

The fourth limitation of our analysis is that we focus on certain firm characteristics—namely, whether a firm is public or private and family or non-family—but do not consider other potentially important characteristics, such as size or internationalization. Our primary purpose was to examine why some firms are prone to tax avoidance while others are not on the basis of factors whose impact on tax planning and whose interaction might provide new insights into the cross-sectional differences that are documented in the literature. The main reason for limiting our analysis to selected characteristics was to keep the model tractable and make the first-order effects visible. However, future research could build on our model to explore further factors which are highly likely to influence cross-sectional differences in tax-planning behavior.

Finally, the assumption on which we based the application of our model to particular firms (see Table 1) also limit our analysis to some extent. We derived these assumptions from the (empirical) literature in the field, which, however, is not always univocal. For example, we assumed that family firms face fewer or less severe moral-hazard problems and thus lower incentivization costs than non-family firms. In practice, however, in family firms there may be conflicts between economic goals and goals related to the family (e.g., Lee and Rogoff, 1996), which non-family firms are unlikely to face. Nevertheless, such conflicts potentially also have an impact on a firm's decision to engage in or refrain from aggressive tax avoidance.

6 Conclusion

In this paper, we develop a formal model to analyze which factors influence a firm's tax-planning decisions and to shed light on the puzzling empirical result that not all firms engage in tax

avoidance. We use a hidden-action model with limited liability and two agents to show that a firm's decision whether to engage in tax avoidance or not partly depends on the problems of moral hazard it faces. We find that tax planning depends on the interaction of the following three factors: (1) firm-level costs, (2) incentivization costs at the agent-level, and (3) the potential to increase earnings. Firms with high firm-level costs, such as reputational or political costs, but low incentivization costs tend to engage in more aggressive tax planning compared to other firms if the potential to increase earnings is low; the reverse is true if the potential to increase earnings is high. In other words, if there is a significant potential to increase earnings substantially by exerting effort, the costs of incentivizing the managers matter less than the potential reputational or political costs the firm might face. Conversely, if this potential is limited, the incentivization costs become more important for the tax-planning decision than reputational or political costs.

Our model provides the theoretical background for testing cross-firm differences in tax planning. The model shows that in addition to moral hazard, the factors that determine the degree of tax avoidance are tax-planning costs and the potential to increase earnings. These findings contribute to research on the empirically observed differences in tax-avoidance strategies between different types of firms, such as between public and private and between family and non-family firms. A main implication of our model is that empirical studies that investigate how firms decide whether to pursue or refrain from tax avoidance should take into account differences in the structure of ownership, the degree of separation between ownership and control within firms, as well as the potential to increase earnings (e.g., Armstrong et al., 2012; Badertscher et al., 2013; Chen et al., 2010; Rego and Wilson, 2012).

Our paper provides several avenues for future research. Specifically, theoretical studies could expand the simple model that we used to shed light on the tax-planning decisions that firms delegate to professional management. The managers' compensation contracts in our model had a universal structure, so further theoretical works could focus on more detailed and specific compensation contracts. Future empirical work could also test the specific empirical predictions that we derived in the paper; namely that (1) all else being equal, private firms are more likely to engage in tax-planning activities than public firms, (2) when the potential to increase earnings is high, family firms are less likely to become tax planners than non-family firms, and (3) when the potential to increase earnings is low, family firms are more likely to avoid taxes than non-

family firms. Our model can also be interpreted with regard to other types of firms that differ in the degree of firm-level costs, agent-level costs, and the potential to increase earnings.

Appendix A: Proofs

Proof of Proposition 1.

The proof directly follows from a comparison of Π_{HH}^* and Π_{LH}^* . ■

Proof of Lemma 1.

The optimal wages and the principal's payoff are obtained via backward induction. Generally, if the principal wants to implement low effort, she will choose to pay the lowest possible wage, which is equal to zero due to the agents' limited liability constraints; that is $(w_h^x)^A = 0$ and $(w_t^L)^B = 0$. The incentive compatibility constraints for both agents (expressions (2) and (3)) for providing high effort are then binding and can be rewritten as follows:

$$(p_1(\cdot) - p_0(\cdot))(w_t^x)^A - \gamma(\cdot) = 0 \text{ and}$$

$$(q_1 - q_0)(w_t^H)^B - \kappa(\cdot) = 0.$$

Solving for $(w_t^x)^A$ and $(w_t^H)^B$ results in the wages described in Lemma 1. Inserting the optimal wages into the principal's expected payoff Π_{HH} results in the profit described in equation (4).

■

Proof of Lemma 2.

The proof is analogous to the Proof of Lemma 1, with the only difference that the tax manager's wage is now always equal to zero. ■

Proof of Proposition 2.

The proof directly follows from a comparison of equations (4) and (5). ■

Proof of Lemma 3.

The proof is analogous to the Proof of Lemma 1. The only difference concerns the CEO's compensation, because the principal wants the CEO to provide high effort for generating earnings only if $t = t_l$. That is, the principal sets $(w_h^H)^B = 0$. ■

Proof of Lemma 4.

The proof is analogous to the proof of Lemma 3, with the only difference that the tax manager's wage is now always equal to zero. ■

Proof of Proposition 3.

The proof directly follows from a comparison of equations (8) and (9). ■

Appendix B

Sequential Setting: Earnings Generation Precedes Tax Planning

To complete the analysis, we report the setting in which a firm decides on the provision of incentives for the tax manager after the outcome of the earnings generation activity has been observed. In this case, the firm has the possibility to condition the provision of incentives for the tax-planning activity on the earnings outcome. However, it turns out that this sequential setting can be regarded as a special case of the simultaneous setting analyzed in Section 3.3. If tax planning depends on earnings and the earnings outcome is uncertain, we need to consider cases of low earnings $x = x^L$ and high earnings $x = x^H$ separately.

Following our line of argumentation in the first-best scenario, we focus on cases in which the principal always wants the CEO to exert high effort towards the generation of earnings. Afterwards, the principal observes x and decides what incentives to provide for the tax-planning activity on the basis of the information about x . This means that, ex-ante, the principal finds herself in the same situation as in the simultaneous setting, but with an additional flow of information after the outcome of the effort expended on the generation of earnings has been observed. Accordingly, the decision on whether to engage in aggressive tax-planning or not can be derived from expression (6) in Proposition 2. The benefits on the right-hand side are then separated and include either $[x^H - \frac{\kappa(\cdot)}{q_1 - q_0}]$ or x^L , depending on the observation about x .

Generally, the higher the tax base, the more attractive it becomes for a firm to engage in aggressive tax planning. As a consequence, a firm benefits from knowing the earnings number prior to deciding whether to engage in aggressive tax planning or not. When earnings are high aggressive tax planning may be preferred over the routine activity; however, this may not be the case when earnings are rather low. In a simultaneous setting, the information on earnings is not available when a firm decides on tax planning and the expected earnings become significant. In such cases the owners may decide to engage in aggressive tax planning without knowing the outcome of the earnings. That decision will appear ex post to have been flawed if the earnings turn out to be low and will indicate that routine tax planning would have been a more attractive option. Similarly, it is possible that on the basis of expected earnings the firm may decide not to engage in aggressive tax planning, although if earnings turn out to be high, aggressive tax planning will appear ex post preferable. For tax-planning purposes, it is therefore better to

know ex ante whether the earnings are high or low, because having such information enables the firm to choose a more sustainable tax strategy. However, from an ex-ante perspective, the simultaneous setting and the setting discussed here yield identical expected results for the principal.

References

- Ang, J. S., Cole, R. A. and Wuh Lin, J. (2000). Agency costs and ownership structure, *The Journal of Finance* **55**(1): 81–106.
- Armstrong, C. S., Blouin, J. L. and Larcker, D. F. (2012). The incentives for tax planning, *Journal of Accounting and Economics* **53**(1-2): 391–411.
- Astrachan, J. H., Klein, S. B. and Smyrnios, K. X. (2002). The F-PEC scale of family influence: A proposal for solving the family business definition problem, *Family Business Review* **15**(1): 45–58.
- Austin, C. R. and Wilson, R. (2015). Are reputational costs a determinant of tax avoidance? SSRN Working Paper No. 2216879.
- Badertscher, B. A., Katz, S. P., Pincus, M. and Rego, S. O. (2009). Earnings management strategies and the trade-off between tax benefits and detection risk: To conform or not to conform?, *The Accounting Review* **84**(1): 63–97.
- Badertscher, B. A., Katz, S. P. and Rego, S. O. (2013). The separation of ownership and control and corporate tax avoidance, *Journal of Accounting and Economics* **56**(2-3): 228–250.
- Bankman, J. (2004). An academic’s view of the tax shelter battle, in H. J. Aaron and J. Slemrod (eds), *The crisis in tax administration*, 1st edn, Brookings Institution, Washington D.C., pp. 9–37.
- Bauer, A. M. and Klassen, K. J. (2014). Estimating downside tax risk using large unfavorable tax payments. SSRN Working Paper No. 2379666.
- Berle, A. A. and Means, G. C. (1932). *The modern corporation and private property*, 1st edn, New York, NY: Harcourt, Brace, & World.
- Cai, H. and Liu, Q. (2009). Competition and corporate tax avoidance: Evidence from Chinese industrial firms, *Economic Journal* **119**(537): 764–795.
- Chen, K.-P. and Chu, C. C. Y. (2005). Internal control versus external manipulation: A model of corporate income tax evasion, *The RAND Journal of Economics* **36**(1): 151–164.
- Chen, S., Chen, X., Cheng, Q. and Shevlin, T. (2010). Are family firms more tax aggressive than non-family firms?, *Journal of Financial Economics* **95**(1): 41–61.
- Cheng, C. S. A., Huang, H. H., Li, Y. and Stanfield, J. (2012). The effect of hedge fund activism on corporate tax avoidance, *The Accounting Review* **87**(5): 1493–1526.

- Chrisman, J. J., Chua, J. H. and Litz, R. A. (2004). Comparing the agency costs of family and non-family firms: conceptual issues and exploratory evidence, *Entrepreneurship Theory and Practice* **28**(4): 335–354.
- Chyz, J. A., Leung, W. S. C., Li, O. Z. and Rui, O. M. (2013). Labor unions and tax aggressiveness, *Journal of Financial Economics* **108**: 675–698.
- Crocker, K. J. and Slemrod, J. (2005). Corporate tax evasion with agency costs, *Journal of Public Economics* **89**(9-10): 1593–1610.
- Desai, M. A. and Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives, *Journal of Financial Economics* **79**(1): 145–179.
- Desai, M. A. and Dharmapala, D. (2009a). Corporate tax avoidance and firm value, *Review of Economics & Statistics* **91**(3): 537–546.
- Desai, M. A. and Dharmapala, D. (2009b). Earnings management, corporate tax shelters, and book-tax alignment, *National Tax Journal* **62**(1): 169–186.
- Dhaliwal, D. S., Gleason, C. A. and Mills, L. F. (2004). Last-chance earnings management: Using the tax expense to meet analysts' forecasts, *Contemporary Accounting Research* **21**(2): 431–459.
- Dyer Jr., W. G. and Whetten, D. A. (2006). Family firms and social responsibility: Preliminary evidence from the S&P 500, *Entrepreneurship Theory and Practice* **30**(6): 785–802.
- Dyreng, S. D., Hanlon, M. and Maydew, E. L. (2008). Long-run corporate tax avoidance, *The Accounting Review* **83**(1): 61–82.
- Dyreng, S. D., Hanlon, M. and Maydew, E. L. (2010). The effects of executives on corporate tax avoidance, *The Accounting Review* **85**(4): 1163–1189.
- Dyreng, S. D., Hanlon, M. and Maydew, E. L. (2014). Rolling the dice: When does tax avoidance result in tax uncertainty? SSRN Working Paper No. 2374945.
- Dyreng, S. D., Hoopes, J. L. and Wilde, J. H. (2016). Public pressure and corporate tax behavior, *Journal of Accounting Research* **54**(1): 147–186.
- Dyreng, S. D. and Lindsey, B. P. (2009). Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on U.S. multinational firms' tax rates, *Journal of Accounting Research* **47**(5): 1283–1316.
- Ernst & Young (2011). *Tax risk and controversy survey: A new era of global risk and uncertainty*, 1st edn, New York, NY: E&Y.

- Fama, E. F. and Jensen, M. C. (1983). Separation of ownership and control, *Journal of Law and Economics* **26**(2): 301–325.
- Fields, T. D., Lys, T. Z. and Vincent, L. (2001). Empirical research on accounting choice, *Journal of Accounting and Economics* **31**(1-3): 255–307.
- Foreman, P. and Whetten, D. A. (2002). Members' identification with multiple-identity organizations, *Organization Science* **13**(6): 618–635.
- Francis, J. and Smith, A. (1995). Agency costs and innovation. Some empirical evidence, *Journal of Accounting and Economics* **19**(2-3): 383–409.
- Frank, M. M., Lynch, L. J. and Rego, S. O. (2009). Tax reporting aggressiveness and its relation to aggressive financial reporting, *The Accounting Review* **84**(2): 467–496.
- Gallemore, J., Maydew, E. L. and Thornock, J. R. (2014). The reputational costs of tax avoidance, *Contemporary Accounting Research* **31**(4): 1103–1133.
- Gómez-Mejía, L. R., Cruz, C., Berrone, P. and De Castro, J. (2011). The bind that ties: Socioemotional wealth preservation in family firms, *The Academy of Management Annals* **5**(1): 653–707.
- Gómez-Mejía, L. R., Takács Haynes, K., Núñez Nickel, M., Jacobson, K. J. and Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills, *Administrative Science Quarterly* **52**(1): 106–137.
- Graham, J. R., Hanlon, M. and Shevlin, T. (2011). Real effects of accounting rules: Evidence from multinational firms' investment location and profit repatriation decisions, *Journal of Accounting Research* **49**(1): 137–185.
- Graham, J. R., Hanlon, M., Shevlin, T. and Schroff, N. (2014). Incentives for tax planning and avoidance: Evidence from the field, *The Accounting Review* **89**(3): 991–1023.
- Gupta, S. and Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data, *Journal of Accounting and Public Policy* **16**(1): 1–34.
- Han, J. C. and Wang, S.-W. (1998). Political costs and earnings management of oil companies during the 1990 Persian Gulf Crisis, *The Accounting Review* **73**(1): 103–117.
- Hanlon, M. and Heitzman, S. (2010). A review of tax research, *Journal of Accounting and Economics* **50**(2-3): 127–178.
- Hanlon, M., Maydew, E. L. and Saavedra, D. (2016). The taxman cometh: Does tax uncertainty affect corporate cash holdings? SSRN Working Paper No. 2292020.

- Hanlon, M. and Slemrod, J. (2009). What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement, *Journal of Public Economics* **93**(1-2): 126–141.
- Hasegawa, M., Hoopes, J. L., Ishida, R. and Slemrod, J. (2013). The effect of public disclosure on reported taxable income: Evidence from individuals and corporations in Japan, *National Tax Journal* **66**(3): 571–608.
- Hope, O.-K., Ma, M. S. and Thomas, W. B. (2013). Tax avoidance and geographic earnings disclosure, *Journal of Accounting and Economics* **56**(2-3): 170–189.
- Jacob, M., Wentland, K. and Wentland, S. A. (2014). Firm tax uncertainty, cash holdings, and the timing of large investment. SSRN Working Paper No. 2518243.
- Jensen, M. C. and Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics* **3**(4): 305–360.
- Kets de Vries, M. F. (1993). The dynamics of family controlled firms: The good and the bad news, *Organizational Dynamics* **21**(3): 59–71.
- Key, K. G. (1997). Political cost incentives for earnings management in the cable television industry, *Journal of Accounting and Economics* **23**(3): 309–337.
- Koester, A., Shevlin, T. J. and Wangerin, D. (2016). The role of managerial ability in corporate tax avoidance, *Management Science* **forthcoming**.
- Kubick, T. R., Lynch, D. P., Mayberry, M. A. and Omer, T. C. (2015). Product market power and tax avoidance: Market leaders, mimicking strategies, and stock returns, *The Accounting Review* **90**(2): 675–705.
- Lee, M.-S. and Rogoff, E. (1996). Comparison of small businesses with family participation versus small businesses without family participation: An investigation of differences in goals, attitudes, and family/business conflict, *Family Business Review* **9**: 423–437.
- Mills, L. F. (1998). Book–tax differences and internal revenue service adjustments, *Journal of Accounting Research* **36**(2): 343–356.
- Mills, L. F., Nutter, S. E. and Schwab, C. M. (2013). The effect of political sensitivity and bargaining power on taxes: Evidence from federal contractors, *The Accounting Review* **88**(3): 977–1005.
- Mills, L. F., Robinson, L. A. and Sansing, R. C. (2010). FIN 48 and tax compliance, *The Accounting Review* **85**(5): 1721–1742.

- Mills, L. F. and Sansing, R. (2000). Strategic tax and financial reporting decisions: Theory and evidence, *Contemporary Accounting Research* **17**(1): 85–106.
- Philips, J. D. (2003). Tax-planning effectiveness: The role of compensation-based incentives, *The Accounting Review* **78**(3): 847–874.
- Ramanna, K. and Roychowdhury, S. (2010). Elections and discretionary accruals: Evidence from 2004, *Journal of Accounting Research* **48**(2): 445–475.
- Rego, S. O. (2003). Tax-avoidance activities of U.S. multinational corporations, *Contemporary Accounting Research* **20**(4): 805–833.
- Rego, S. O. and Wilson, R. (2012). Equity risk incentives and corporate tax aggressiveness, *Journal of Accounting Research* **50**(3): 775–810.
- Richardson, G. and Lanis, R. (2007). Determinants of the variability in corporate effective tax rates and tax reform: Evidence from Australia, *Journal of Accounting and Public Policy* **26**(6): 689–704.
- Robinson, J. R., Sikes, S. A. and Weaver, C. D. (2010). Performance measurement of corporate tax departments, *The Accounting Review* **85**(3): 1035–1064.
- Schmitz, P. W. (2005). Allocating control in agency problems with limited liability and sequential hidden actions, *RAND Journal of Economics* **36**(2): 318–336.
- Scholes, M. S., Wolfson, M. A., Erickson, M. M., Hanlon, M. L., Maydew, E. L. and Shevlin, T. J. (2014). *Taxes and business strategy: A planning approach*, 5th edn, Pearson Education, Upper Saddle River, NJ.
- Shakelford, D. A. and Shevlin, T. (2001). Empirical tax research in accounting, *Journal of Accounting and Economics* **31**(1-3): 321–387.
- Shleifer, A. and Vishny, R. W. (1997). A survey of corporate governance, *The Journal of Finance* **52**(2): 737–783.
- Slemrod, J. (2004). The economics of corporate tax selfishness, *National Tax Journal* **57**(4): 877–899.
- Stein, L. C. and Stone, E. C. (2013). The effect of uncertainty on investment, hiring, and R&D: Causal evidence from equity options. SSRN Working Paper No. 1649108.
- Villalonga, B. and Amit, R. (2006). How do family ownership, control and management affect firm value?, *Journal of Financial Economics* **80**(2): 385–417.

- Watts, R. L. and Zimmerman, J. L. (1986). *Positive accounting theory*, 1st edn, Prentice Hall, Edgewood Cliffs, NJ.
- Watts, R. L. and Zimmerman, J. L. (1990). Positive accounting theory: A ten year perspective, *The Accounting Review* **65**(1): 131–156.
- Weisbach, D. A. (2002). Ten truths about tax shelters, *Tax Law Review* **55**: 2015–2053.
- Zimmer, I. (1986). Accounting for interest by real estate developers, *Journal of Accounting and Economics* **8**(1): 37–51.
- Zimmerman, J. L. (1983). Taxes and firm size, *Journal of Accounting and Economics* **5**: 119–149.