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How to Account for Tax Planning and Tax Uncertainty in Valuation: Separate vs. Composite View

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Abstract

I investigate how investors value tax planning and tax uncertainty for the case of publicly listed German firms. I compare two recent approaches how to account for tax uncertainty: the separate view by Drake et al. (2019) and the composite view by Jacob and Schütt (2020) to find the better suited way to incorporate tax planning and uncertainty simultaneously. In a battery of tests, I fail to produce results consistent with the separate view. In contrast, the composite view yields robust results that are in line with theory and prior literature: A one standard deviation increase in the quality of tax planning leads to an increase in the positive effect of the return on equity on the firm value of 7.7%. Investors seem to not only care about the level of firms' tax planning, but also how it is achieved. Only combining the degree of tax planning and its associated uncertainty in a single measure (*Tax Planning Score*) leads to robust results, thereby providing support for the notion of Jacob and Schütt (2020) that these constructs should be considered jointly.

JEL classification codes: G32; H25; H26; M21; M41

Keywords: Tax Avoidance; Tax Uncertainty; Firm Value; Tax Planning Score

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1. Introduction

This paper analyses the link between tax planning, uncertainty and firm value for the case of publicly listed German firms. I compare two recent approaches how to account for tax uncertainty in a valuation framework: the separate view by Drake et al. (2019) which treats tax planning and its uncertainty as distinct, and the composite view by Jacob and Schütt (2020) which combines these two concepts in a single measure. By applying different empirical control settings, different tax planning measures, and by translating the Drake et al. (2019) logic to the Jacob and Schütt (2020) framework and vice versa, the robustness and explanatory power of both approaches is assessed to find the better suited way to incorporate tax planning and uncertainty simultaneously.

From a traditional net present value perspective, corporate tax planning leads to lower tax burdens for firms and higher after-tax cash flows, thereby increasing the value of the firm. However, negative effects such as reputational costs (Gallemore et al. 2014) or higher tax induced uncertainty (Guenther et al. 2019) can moderate or even negate these positive effects. A broad definition of tax planning comprises risk- and costless tax planning strategies (like tax-favored bonds), as well as risky and uncertain activities that exploit grey areas of tax laws (like tax sheltering), or are likely to be only temporary in nature (Hanlon and Heitzman 2010). If firms are able to reduce their tax liability without adding substantial uncertainty about future outcomes, their value should increase. In contrast, if firms engage in more risky or uncertain tax planning strategies that are likely to be reversed by fiscal authorities or depend on future tax policy decisions, investors will demand a higher risk premium for the additional tax induced uncertainty (Sikes and Verrecchia 2020). Furthermore, as long as tax planning constitutes nondiversifiable risk for investors, a risk premium should be observed (Hutchens and Rego 2013, 2015; Goh et al. 2016; Heitzman and Ogneva 2019), and, hence, a lower current firm value. The ultimate impact of tax planning on firm value depends on (1) how firms achieve certain levels of tax planning, (2) how much weight investors lay on tax information, (3) how a varying tax planning intensity influences the value and risk assessment of firms.

While prior studies mostly focused on other aspects of corporate tax planning like determinants of tax planning in general (Dyreng et al. 2008), executive incentives (Dyreng et al. 2010), reputational costs (Hanlon and Slemrod 2009; Gallemore et al. 2014), capital structure (Faccio and Xu 2015), or debt cost of capital (Hasan et al. 2014), studies on how to incorporate tax planning and tax uncertainty in a valuation framework are scarce. Recently, two studies provided different approaches for this issue. While Drake et al. (2019) treat the degree of tax planning and its corresponding uncertainty as two separate constructs (*separate view*), Jacob and Schütt (2020) develop a theoretical model in which they ought to be considered jointly (*composite view*). While the authors of both studies argue in favor of their framework, a comprehensive investigation of both approaches in one setting has not been conducted yet. Furthermore, prior literature on value implications of tax planning, equity cost of capital, and stock returns produces ambiguous results and uses different control settings, which makes it difficult to assess their robustness and compare them (e.g., Ammann et al. 2011; Chen et al. 2014; Cook et al. 2017; De Simone and Stomberg 2012; Goh et al. 2016; Hasan et al. 2014; Heitzman and Ogneva 2019; Kim et al. 2011; Sikes and Verrecchia 2020).

This paper contributes to the literature by applying the separate and composite view to publicly listed German firms. First, I replicate the two different approaches relying on similar settings to the original studies of Drake et al. (2019) and Jacob and Schütt (2020), thereby evaluating the role of tax uncertainty and tax planning in valuation for a new setting. Second, I assess the robustness of both frameworks regarding the measures for tax planning and tax uncertainty, over which time horizon these constructs are measured, and which control variable setting is used. Third, I apply the logic of the separate view to the framework of the composite view and vice versa in order to make both approaches comparable, i.e. I empirically model the separate view while using the composite measure of Jacob and Schütt (2020) (Tax Planning Score, TPS), and decompose the TPS into its components. Hence, beyond providing new evidence how investors value tax planning (and uncertainty), this paper also contributes methodologically (1) by investigating the dependency of results on different methodological choices, and (2) by reconciling the composite and separate approach empirically. Since control settings and measures for tax planning vary substantially across prior studies (see Table 2), their produced results are difficult to compare to each other. In this study, I provide evidence which of the two approaches under investigation produces the more robust results, and transparently report how empirical results vary with different measurement and empirical model choices.

The results suggest that only the composite view with the new measure (TPS) of

Jacob and Schütt (2020) leads to consistent results. A one standard deviation increase in the quality of tax planning[1] leads to an increase in the positive effect of pretax income on the firm value of 7.7%, on average. Conversely, the separate view yields inconsistent results that are highly dependent on the tax planning measures and control settings, and explains less variation of the firm value than the composite model. There is also some evidence that applying the empirical (and theoretical) background of Jacob and Schütt (2020) to the separate view yields more consistent results for the latter. This suggests that tax planning is connected to firm value through income channels, rather than directly affecting it, while investors seem to care more about the quality of tax planning than about its level alone. This is reminiscent of a unique and heterogeneous risk-reward-structure of tax planning (Hanlon and Heitzman 2010), since the same degrees of tax planning can be achieved by different levels of risk, varying across firms. Therefore, considering one concept without the other might yield misleading results.

The remainder of the paper is structured as follows. Section 2 briefly discusses and summarizes related literature. Section 3 recapitulates the intuition and theoretical background of the separate and composite view and derives the hypotheses. The empirical approach and data are described in Section 4, while the results are presented in Section 5. Finally, Section 6 concludes by discussing the implications of results.

2. Related Literature

In general, the literature on the connection between tax planning and firm value is comprised of different strands that either directly address the topic or have indirect implications for valuation.[2] Taxes can influence firm value through at least three different channels: (i) Taxes directly affect the after-tax cash flows and earnings of firms; (ii) Taxes affect the after-tax cost of capital; and (iii) Taxes determine the degree of risk sharing with the government. Tax planning activities straight forwardly influence the

[1]Since the TPS is increasing either in lower effective tax rates, or lower volatility of effective tax rates (see Eq. 7), it measures the risk-weighted level of tax planning. Therefore, I argue that the TPS can be viewed as a measure for the "quality" of tax planning, since it acknowledges not only the degree of tax planning, but also with how much risk it is implemented in the firm.

[2]For example, studies examining the association between tax planning and the equity cost of capital (Goh et al. 2016; Cook et al. 2017), or stock returns (Heitzman and Ogneva 2019), do not directly address firm value implications, but the cost of capital is relevant in every valuation formula and is often measured by incorporating stock returns.

first channel positively, since lower tax payments lead to higher after-tax cash flows and earnings. However, tax planning can also increase the uncertainty of future after-tax outcomes, that is making them more volatile. If investors prefer a smooth development of after-tax cash flows and earnings (Neuman 2014), their required return would increase, which reduces firm value. A similar reasoning holds for the third channel: The lower the effective tax burden, the higher the share of risk becomes that lies on the firm instead of the government (Desai and Dharmapala 2009). How investors ultimately value tax planning activities hinges on which effect dominates. The literature focusing directly on this issue is scarce (Hanlon and Heitzman 2010, Drake et al. 2019, Jacob and Schütt 2020). Most closely related to this paper's objectives are studies on the association between tax planning and the equity cost of capital (or stock returns) (channel ii), tax planning and the firm value, and tax risk (channels i and iii).[3]

Tax planning and the cost of equity A considerable part of the empirical literature argues that corporate tax planning induces nondiversifiable risk that leads to higher equity cost of capital. In most of these studies, the risk that corresponds to tax planning activities is assumed to arise due to uncertainty about future tax policies (Brown et al. 2014) and has implications for economic risk through investment returns (Guenther et al. 2017). Brown et al. (2014) show that investors perceive benefits of tax planning activities in times of large uncertainty of the tax policy environment as risky. This in turn increases the investor's risk assessment of investments. Heitzman and Ogneva (2019) use US data and distinguish between time periods under Republican and Democratic administrations. Their findings of a positive association between tax planning and stock returns can be almost entirely explained by the "tax-friendly" Republican terms. The literature on tax planning and stock returns seems to support the notion that tax planning is, on average, associated with nondiversifiable risk. This translates into negative implications for the firm value, since investors require a higher future return to investment which depresses the current firm value.

In contrast, studies investigating the direct connection between tax planning and firms' cost of equity (e.g., Hutchens and Rego 2013 and Goh et al. 2016) suggest that more intensive tax planning can also affect the cost of equity positively, implying that the

[3]The literature on the equity cost of capital (Goh et al. 2016; Cook et al. 2017) often uses stock returns to proxy for the dependent variable, such that this strand of studies (e.g., Heitzman and Ogneva 2019) needs to be acknowledged as well.

latter decrease the more tax planning a firm engages in. However, Hutchens and Rego (2013) find that the uncertainty caused by some tax planning strategies can instead lead to higher cost of equity, as the probability that tax planning strategies are uncovered and prohibited increases if tax planning activities are intensified by firms in their setting. Hanlon and Slemrod (2009) support this by showing a correlation between stock prices and the aggressiveness of tax planning. For companies whose activities in tax havens have been uncovered, stock prices significantly decrease. Interestingly, investors only seem to value tax planning positively when they know or believe (e.g. through financial statement information) that the firm has not previously engaged in aggressive tax planning. Overall, the results on the influence of tax planning on stock prices, returns and the cost of capital are inconclusive and rely on models that focus solely on tax planning or uncertainty separately.

Tax planning, risk and firm value Desai and Dharmapala (2009) find evidence that lower tax payments cannot be considered as a simple transfer from the government to the investors, since the risk share for the firm increases. Their approach puts emphasis on the agency theory, which acknowledges the difference between ownership and control of firms, and implies that the effect of tax planning on firm value strongly depends on the quality of corporate governance. In Kim et al. (2011), however, a positive association between tax planning and the risk of unusually strong decreases in stock prices is likewise attributed to the agency principle. Hence, this strand of literature produces heterogeneous results as well.

So far, the described studies neglect tax risk as a unique concept. Vello and Martinez (2012) find that more efficient tax planning strategies significantly reduce market risk, as long as processes within the company follow good corporate governance. Conversely, Assidi (2015) conducts a case study for 40 publicly-traded French companies and finds a positive relationship between effective tax rates, or their volatility, and firm risk. Hutchens and Rego (2015) relate different measures of tax risk to firm risk. Only the volatility of cash effective tax rates and book-tax differences are significantly associated with firm risk. Other measures either show a negative association with firm risk or none at all. Therefore, the results are not robust to different specification choices. Nesbitt et al. (2017) show for a sample of Luxembourg firms, whose tax planning activities have been revealed in the Luxembourg Leaks, that investors reacted positively to the exposure, which might be explained by a reduction in uncertainty. Lastly, Guenther et al. (2017) conceptually distinguish between tax risk, tax planning and tax aggressiveness and find a positive relationship between tax risk and firm risk. However, they do not find a direct effect of tax planning itself on risk.

Two recent studies offer approaches how to account for both, tax planning and tax uncertainty empirically. Drake et al. (2019) treat the degree of tax planning and its uncertainty as distinct constructs, while Jacob and Schütt (2020) combine them in a composite measure (Tax Planning Score, TPS). Unlike prior studies, Jacob and Schütt (2020) develop a theoretical framework and do not attempt to find a direct effect of tax planning on firm value, but rather suggest that their relation is determined through pretax income channels. Drake et al. (2019) interact measures of tax planning (effective tax rates) with measures of tax uncertainty (volatility of effective tax rates) and directly link them to firm value. The firm value decreases with the volatility of effective tax rates and increases with the degree of tax planning, while this positive association is moderated by the tax risk. In Jacob and Schütt (2020), firms with a higher TPS, which increases with the degree of tax planning and decreases with the tax uncertainty, experience a higher positive effect of pretax income on firm value. While it seems to be clear that tax planning and uncertainty should both be considered in a valuation framework, it is unclear whether the separate view of Drake et al. (2019) or the composite view of Jacob and Schütt (2020) is better suited for the task. Drake et al. (2019) note that they obtain similar results to Jacob and Schütt (2020) when they apply the composite approach, but Jacob and Schütt (2020) fail to reproduce their finding. This study therefore applies different empirical approaches, measures, and control settings to shed light on the robustness and implications of both approaches.

3. Theoretical Background and Hypotheses

3.1. Separate View

Drake et al. (2019) derive their hypotheses solely from prior empirical work, where tax planning is supposedly linked to higher firm values, on average. As described above, however, the literature does not find this positive connection for all forms of tax planning.

Instead of developing a distinct theoretical model, Drake et al. (2019) rely on the CAPM logic that nondiversifiable risk leads to higher risk premiums and on the model extension of Sikes and Verrecchia (2020) of Lambert et al. (2007). In this framework, the uncertainty of firms' after-tax cash flows increases with the uncertainty of tax planning strategies of the whole market or industry in which the firm operates. Drake et al. (2019) conclude that higher tax risk should lead to lower firm values and lower positive value implications of tax planning.

This logic with regard to the interaction of tax planning and risk bears some caveats. First, the Sikes and Verrecchia (2020) model develops a framework in which *aggregate* tax planning of *industries* is the main variable of interest, not the individual firm-level tax outcomes. Second, while there is a clear trade-off between risk and return in the CAPM model, the relationship of tax risk and the degree of tax planning is not as clear. Guenther et al. (2017; 2019) show that lower effective tax rates are actually more persistent than high rates on average, meaning that a high degree of tax planning can be achieved through relatively riskless planning strategies. As Hanlon and Heitzman (2010) note, tax planning can be broadly defined as a spectrum of activities which reduce the tax liability. This might include risky and even grey-area strategies, as well as actions that are persistent and do not bear the risk of penalties, tax policy uncertainty, and reputational cost. While Drake et al. (2019) acknowledge this reasoning, they nevertheless rely on the CAPM logic and are unable to capture the unique risk dimension of tax planning.

3.2. Composite View

Jacob and Schütt (2020) develop a theoretical framework in which these problems can be addressed. This subsection briefly restates the steps that are necessary to arrive at the Jacob and Schütt (2020) valuation formula. Starting from the residual income model (Feltham and Ohlson 1995), they provide a reasoning for the need of considering tax planning and tax uncertainty jointly. In their model, the current market value of firm i at time t is the sum of the current book value and the discounted future residual income:

$$M_{i,t} = B_{i,t} + \mathbb{E}_{i,t}\left[\sum_{t=1}^{\infty} \frac{RI_{i,t}}{(1+r)^t}\right] \tag{1}$$

where M is the market value, B is the book value, RI is the residual income, and r is the cost of equity after taxes. The residual income after taxes in t can be written as: $RI_{i,t} = \delta_{i,t} \cdot (I_{i,t}^{pretax} - r^{pretax} \cdot B_{i,t-1})$, where I is the income after taxes and δ is a tax multiplier. Future outcomes of δ are assumed to fluctuate around its mean value: $\delta_{i,t+1} = \mu_\delta + \epsilon_{i,t+1}$. If the income development follows a mean-reverting process, Eq. 1 can be written as:

$$M_{i,t} = B_{i,t} + \mathbb{E}_{i,t}\left[\mu_\delta\right] \cdot D_{i,t} \cdot RI_{i,t}^{pretax} \tag{2}$$

where D is a discount factor that also accounts for the future development of income. The key parameter of interest, μ_δ, is uncertain. Jacob and Schütt (2020) assume that investors rely on information about the volatility of tax rates in the past to arrive at the expected value of future tax rates today. Average future tax rates are uncertain in two dimensions: the statutory tax rates, s, which are set by the government are uncertain, and the level of corporate tax planning, and hence the effective tax rates of firms, τ, are uncertain. Under standard assumptions of normally distributed statutory rates and variations in tax planning, the expected tax rates in the future are given by:

$$\mu_\delta | \delta_{i,t} \ldots \delta_{i,t-n}, \delta_s, \sigma_s, \delta_{i,\tau}, \sigma_{i,\tau} = \frac{\frac{1}{\sigma_s^2}\delta_s + \frac{n}{\sigma_{i,\tau}^2}\bar{\delta_{i,\tau}}}{\frac{1}{\sigma_s^2} + \frac{n}{\sigma_{i,\tau}^2}} \tag{3}$$

Eq. 3 gives a formal reassurance for the logic that was already discussed in Drake et al. (2019): the more volatile tax rates are expected to be (σ_s and σ_τ), the lower the information content (the higher the uncertainty or risk). Finally, the expression can be substituted in Eq. 2. Dividing both sides by the book value yields:

$$\frac{M_{i,t}}{B_{i,t}} = 1 + \frac{\frac{1}{\sigma_s^2}\delta_s + \frac{n}{\sigma_{i,\tau}^2}\bar{\delta_{i,\tau}}}{\frac{1}{\sigma_s^2} + \frac{n}{\sigma_{i,\tau}^2}} \cdot D_{i,t} \cdot \frac{RI_{i,t}^{pretax}}{B_{i,t}} \tag{4}$$

which is the final valuation formula in Jacob and Schütt (2020). The composite view gives a clear theoretical indication how to account for tax uncertainty in a valuation framework. According to Eq. 4, the tax term interacts with pretax income (RI^{pretax}/B). Furthermore, the tax parameter is a uncertainty weighted tax rate in line with reasonable assumptions about investors' expectations.[4] Jacob and Schütt (2020) develop the Tax Planning Score (TPS) to estimate the tax parameter in Eq. 4, which relates the level of tax planning (effective tax rate) to its corresponding uncertainty (see Section 4).

3.3. Hypotheses

Building on the discussion of the prior empirical literature in Section 2 and the theoretical considerations, a simplified logic would imply that tax planning should be value enhancing, while more tax uncertainty should be value decreasing. The first hypotheses can therefore be formulated in line with Drake et al. (2019) to test the separate view:

H1a: A higher degree of tax planning is associated with a higher firm value.

H1b: Higher tax uncertainty is associated with a lower firm value.

H1c: Tax planning becomes less value enhancing when the tax uncertainty rises.

As argued before, however, the degree of tax planning and its associated uncertainty are not simply proportional to each other. For example, two different firms could achieve the same level of tax planning with strategies that expose the firm to different tax risks. The separate view might not be capable to account for this interdependence. According to Eq. 4, the tax parameter, TPS, acts as a multiplier for the positive effect of pretax income on firm value, rather than directly impacting it:

H2: A higher TPS enhances the positive effect of pretax income on firm value.

Lastly, this paper aims to investigate which model is better suited to incorporate tax uncertainty in a valuation framework. Since the composite view of Jacob and Schütt (2020) and the separate view of Drake et al. (2019) differ with regard to how both dimensions of tax planning (the level and the uncertainty) are accounted for, I expect their approaches to perform differently in empirical specifications. While the composite view is likely to perform well due to the strong theoretical background and the capability of capturing the level and uncertainty of tax planning at the same time, it could still be that there is a direct association as proposed by the separate view (in contrast to indirectly affecting firm value through the income channel). Therefore, I formulate the third

[4] Investors commonly need to rely on past information to form expectations. Historic volatilities of the stock market, for example, are easily accessible and a main measure for risk. Hence, using the standard deviation of past tax outcomes to operationalize tax uncertainty is consistent with investors' general risk assessment.

hypotheses in an undirected way and choose the robustness of models across different measurement choices and control settings, and their explanatory power as criteria for performance:

H3: One of the two views (composite vs. separate) yields more robust results than the other view and is capable of explaining a higher share of variation in firm value.

4. Method and Data

4.1. Measures of Tax Planning and Tax Uncertainty

I follow the broad definition of tax planning by Hanlon and Heitzman (2010), where tax planning comprises all activities that reduce the tax liability of a firm, which has the merit of including risky as well as riskless planning strategies. The most common measures used by prior literature are effective tax rates, which relate the tax expenses or cash taxes paid to the tax base. While cash effective tax rates (*CETR*s) are able to incorporate tax deferral strategies, GAAP effective tax rates (*GETR*s) exclude them by definition. Furthermore, *GETR*s are more prone to be biased by earnings management, since both, the numerator as well as the denominator are composed of balance sheet items ($GETR = TaxExpense/PretaxIncome$). Therefore, in line with Drake et al. (2019) and Jacob and Schütt (2020), the main tax planning measure for the analyses is the *CETR*. Dyreng et al. (2008) suggest to calculate the *CETR* as a long run measure over 10 years in order to reduce potential measurement error due to year-to-year fluctuations. However, this procedure leads to a considerable loss of variation and observations for the analysis. I therefore calculate the *CETR* over a 5 year rolling window as follows:[5]

$$CETR_{i,t} = \frac{\sum_{z=t-4}^{t} CashTaxesPaid_{i,z}}{\sum_{t-4}^{t} PretaxIncome_{i,z}} \tag{5}$$

Empirical proxies for tax uncertainty differ in their ability to capture different types of tax aggressiveness (Blouin 2014). While reserves for unrecognized tax benefits (*UTB*) are commonly used in US settings (e.g., Lisowsky et al. 2013; Ciconte et al. 2016), the German accounting rules do not require firms to disclose these positions. I rely on the

[5] Hanlon and Heitzman (2010) note that a time horizon anywhere between 3 and 10 years can be considered as reasonable. In robustness tests, I also calculate the measures over 3, 8, and 10 years.

volatilities of effective tax rates as the main measure of tax uncertainty, since they capture the dispersion of possible tax outcomes. In a valuation framework, investors need to rely on information from the past which is timely available to them (Drake et al. 2019; Jacob and Schütt 2020). Guenther et al. (2017) provide evidence that the *CETR* volatility might be the most robust measure for tax uncertainty. In accordance with the definition of tax planning in Eq. 5, tax uncertainty is therefore calculated as the standard deviation of the *CETR* over a 5 year rolling window:

$$VolCETR_{i,t} = \sqrt{\sum_{z=t-4}^{t} (CETR_{i,z} - Mean(CETR_i))^2} \tag{6}$$

Finally, the two measures of tax planning and tax uncertainty can be combined to calculate a single measure of the quality of tax planning, the Tax Planning Score (TPS), which relates the level of tax planning to the associated tax uncertainty (Jacob and Schütt 2020):

$$TPS_{i,t} = \frac{1 - CETR_{i,t}}{VolCETR_{i,t}} \tag{7}$$

The *TPS* increases with a higher degree of tax planning (numerator) and decreases with higher uncertainty (denominator), which takes into account that firms can achieve certain levels of *CETR*s with different corresponding risk.[6]

4.2. Empirical Strategy

The aim of this paper is to assess the separate and composite view in one comprehensive setting. As a starting point, I replicate and compare both views by applying the following OLS regressions:

$$\begin{aligned} PTB_{i,t} = \beta_0 &+ \beta_1 TP_{i,t} + \beta_2 TU_{i,t} + \beta_3 TP_{i,t} \cdot TU_{i,t} + \beta_4 PI_{i,t} + \beta_5 VolPI_{i,t} \\ &+ \beta_6 PI_{i,t} \cdot VolPI_{i,t} + \beta_6 SalesGrowth_{i,t} + \beta_7 X_{i,t} \\ &+ \alpha_i + \gamma_t + \epsilon_{i,t} \end{aligned} \tag{8}$$

[6] In additional analyses, I calculate all described measures with the *GETR* as alternative proxy. Importantly, in all TPS calculations the time windows over which the TPS components (numerator and denominator) are calculated always coincide.

for the Drake et al. (2019) model. Eq. 4 can be written as a reduced-form OLS regression equation of the composite view by Jacob and Schütt (2020) of the form:

$$
\begin{aligned}
PTB_{i,t} = \beta_0 + \beta_1 PI_{i,t} + \beta_2 TPS_{i,t} + \beta_3 TPS_{i,t} \cdot PI_{i,t} + \beta_4 SalesGrowth_{i,t} \\
+ \beta_5 SalesGrowth_{i,t} \cdot TPS_{i,t} + \beta_6 CoE_{i,t} + \beta_7 X_{i,t} \cdot Y_{i,t} \\
+ \alpha_i + \gamma_t + \epsilon_{i,t},
\end{aligned}
\tag{9}
$$

where $PTB_{i,t}$ is the price-to-book ratio of firm i in year t, TP is a measure for the degree of tax planning, TU measures the tax uncertainty, TPS is the *Tax Planning Score*, CoE is the cost of equity (approximated by the stock return plus the risk-free rate), PI and $VolPI$ are the pretax income (scaled by the book value of common equity in line with Jacob and Schütt 2020) and its volatility, respectively, $SalesGrowth$ is the growth of sales over 5 years, X is a vector of additional controls (including cashflow volatility, stock price volatility, leverage, and depreciation expenses), and α_i and γ_t are firm- and year-fixed effects, respectively. Volatilities are calculated using a 5 year rolling window, while non-percentage variables are scaled by once lagged total assets. All control variables are winsorized at the first and 99th percentiles. A detailed description of the main variables, along with their calculation, can be found in Table 1. The variable definitions are as close as possible to Drake et al. (2019) and Jacob and Schütt (2020).[7]

According to the first three hypotheses, β_1 in Eq. 8 is expected to be negative (1a), β_2 negative as well (1b), and β_3 positive (1c).[8] The coefficient of interest in Eq. 9 is β_3, expected to be positive (Hypotheses 2), since a higher TPS should enhance the positive effect of pretax income on firm value ($\beta_1 > 0$).

To assess the more robust way to account for tax uncertainty in a valuation framework (Hypothesis 3), I apply different measures for tax planning and tax uncertainty to the regression Eq. 8 and 9, as well as different control settings of the prior literature,

[7] Since the data source is Datastream from Thomson Reuters (see Subsection 4.3), some information is not available or slightly different compared to Compustat. For example, $CashTaxesPaid$ is not a position that is included in Datastream. Instead, the item $CashFlowTaxation$ is used, which is equivalent to $CashTaxesPaid$ but has structurally more missings than the latter. I deal with this issue by also using GAAP effective tax rates in the main analyses and unrestricted samples which include all available information for GAAP ETRs as robustness tests (see Appendix A, Subsection A.2).

[8] Since tax planning is measured as effective tax rates (see Subsection 4.1), lower values mean a higher degree of tax planning. Therefore, a negative β_1 would imply that more tax planning is associated with a higher firm value. Tax uncertainty is measured as the standard deviation of the TP measure, such that higher values imply higher uncertainty.

and compare the dispersion of coefficient estimates across specifications as well as the explanatory power of models. The included controls for each of the 13 settings of the selected prior literature are listed in Table 2 and were chosen as close as possible to the original studies. The settings vary considerably across studies and exert different levels of danger with regard to potential omitted variable bias or over-control bias (see Subsection A.1). Hence, the dependency of the separate and composite view on the choice of control variables can be evaluated suitably by comparing the depicted settings.

[insert Table 1 here]

[insert Table 2 here]

Lastly, since Jacob and Schütt (2020) already made the point (albeit with more emphasis on theory than empirics) that the separate view might suffer from miss-specification, another important challenge is to translate the TPS logic into the separate framework and vice versa. I conduct this exercise in additional analyses in Subsection 5.3.

4.3. Data and Descriptive Statistics

The balance sheet and equity data of publicly listed German firms for the sample period 2008–2018 stem from Datastream by Thomson Reuters. Additionally, information on the return to ten-year German government bonds are acquired from the *Deutsche Bundesbank* as a measure for the risk free rate of return to calculate the cost of equity. Since long run measures over 5 years are used in the main analysis, data on tax expenses, cash taxes paid, and pretax income need to be available from 2004 onward. Unlike Compustat and US Data in general, cash taxes paid is a variable that is relatively scarce in the German data.[9] Nevertheless, I construct a balanced sample for the main analysis to ensure that the same sample is used in all specifications and the results are not driven by different firms in each specification.[10] Starting with 3,870 firm-year observations for all publicly listed German firms that are active in the last sample year, and for which information on cash taxes paid is available, 329 observations with negative cash taxes paid, 687 observations

[9]The item in Datastream for cash taxes paid is "Cashflow Taxation", which has more than double the missings of "Income Taxes".

[10]Tables A.4, A.5, A.6, A.7 in Appendix A report results when using all information available on *GETR*s which leads to more observations.

with negative pretax income, and 182 observations with negative tax expenses are deleted, since the incentives for tax planning are ambiguous for loss firms and their effective tax rates are difficult to interpret. Lastly, 1,556 observations are dropped due to missing information regarding the other control variables, leading to a final sample composed of 1,116 firm-year observations. Table 3 presents the descriptive statistics for the main variables.

[insert Table 3 here]

The effective tax rates are winsorized at 0 and 1, while all other variables are winsorized at the first and 99th percentiles. The mean values of the main variables are comparable to prior literature: the mean *CETR* (0.29) is slightly lower than the mean *GETR* (0.30), while the average firm has a price-to-book ratio of 2.64 and a *TPS* of 11.23. There seems to be a high variation in the sample regarding the *TPS*, *SalesGrowth*, and firm value, since the standard deviations for those variables are relatively large.

Figure 1 provides graphical illustrations of the distribution of price-to-book ratios across *CETR* deciles (Panel 1a), *CETR* volatility deciles (Panel 1b), and *TPS* deciles (Panel 1c). Similar to Jacob and Schütt (2020), the firm value rises in the bottom *CETR* deciles and shrinks in top deciles, while the highest firm values can be found in the middle. Contrary to the intuition of high tax planning (low *CETR*s) being connected to high firm values (Drake et al. 2019), the lowest *CETR*s are associated with the lowest firm values. The relationship of tax uncertainty and firm value is much clearer, since the highest firm values in Panel 1b are distributed at the lowest *CETR* volatility deciles. This could be an explanation for the inconclusive *CETR* distribution: low *CETR*s might be achieved by high risk strategies, which are valued negatively by investors. However, the separate view cannot account for these effects. When both measures are combined in Panel 1c, the firm value is generally rising the higher the *TPS* becomes (see also Table 8). Overall, Figure 1 provides initial evidence that the composite view might be better suited to account for tax uncertainty in a valuation framework.

[insert Figure 1 here]

5. Regression Results

5.1. Replicating the Separate and Composite View

Table 4 reports the results of estimating Eq. 8 to test Hypotheses 1a-1c. The first three columns report coefficients without firm fixed effects, while the last three columns include all fixed effects.[11] The control variables are added step-by-step rather than immediately in order to test the robustness of specifications.[12] The coefficient estimates indicate that there is a large positive association between pretax income and the price-to-book ratio as expected. This effect seems to be moderated by operating risk (negative and significant coefficients on the interaction terms of PI and its volatility and the cash flow volatility).

Regarding the tax planning variables of interest, there is neither systematical evidence for the degree of tax planning having positive value implications (since there are positive coefficients on TP), tax uncertainty having negative value implications (since there are positive coefficients on TU), nor for tax uncertainty moderating the association between TP and the firm value. The coefficients on the interaction term between TP and TU are negative across all columns and mostly not statistically significant. Hence, the separate view does not yield significant results in line with Hypotheses 1a-1c. Table 4 rather suggests that measures for operating volatility are much more important in the valuation process than tax related information (*VolPI*, *VolCF*, *VolP*) in the separate view.

[insert Table 4 here]

Turning to the composite view, Table 5 provides the results of estimating Eq. 9. The columns refer to the same specifications as in Table 4. First, I again find positive and highly significant coefficients on PI, but of a much more reasonable size: According to the estimate in column (6), a one standard deviation increase in pretax income (15%) is associated with an increase in the price-to-book ratio of 1.820 (68.94%), evaluated at the sample mean values. Second, the coefficient on TPS is slightly negative. However, the model of Jacob and Schütt (2020) does not make a prediction about the direct relationship

[11] The results are also robust to excluding year fixed effects.

[12] For convenience of presentation, the controls are reported in packages in Tables 4 and 5. The results remain almost unchanged when the controls are added one by one.

of the *TPS* and firm value.[13] Most importantly, the estimates on the interaction term between *TPS* and *PI* are positive and highly significant in line with Hypothesis 2. The economic size of the effect is comparable to Jacob and Schütt (2020) and considerable: In the most comprehensive model (6), a one standard deviation increase in *TPS* increases the coefficient of *PI* by 0.203, which is roughly 7.7% when compared to the baseline effect of *PI*. Hence, if the mean firm increases its *TPS* by one standard deviation, the effect of a one standard deviation increase in *PI* on the price-to-book ratio increases from 68.94% to 74.25% ($68.94\% \cdot 1.077$). Third, the association between *TPS* and the firm value does not seem to be driven by operating volatility, since the interaction term with *VolP* (*VolCF*) is not significant (only marginally significant and small).

[insert Table 5 here]

Taken together, Tables 4 and 5 show that the separate view does not yield coherent results in line with Drake et al. (2019), whereas the TPS-specification produces comparable results to Jacob and Schütt (2020). Furthermore, the explanatory power of each specification is systematically higher for the composite view (R-squared). However, these initial replications are not sufficient to conclude which view performs better. The next section therefore turns to the robustness of both views.

5.2. Robustness Tests

5.2.1. Measuring Tax Planning

To ensure that the baseline results are not driven by the arbitrary choice of how to measure tax planning and tax uncertainty, I re-run the baseline regressions with the $GETR$ as well as with different time horizons over which the proxies are calculated (3, 5, 8, and 10 years). Table 6 presents the results for the separate view, while Table 7 contains the *TPS* model. All specifications include firm fixed effects, year fixed effects, and the full set of control variables. Note that there are less observations available for the 8 and 10 year variants, since additional years are required to perform the rolling window calculations. The baseline results for the separate view are not sensitive to the applied measure:

[13]When regressing the TPS on the firm value without interactions, the coefficient is positive and mostly significant (see Table 4), confirming the descriptive graphical illustration in Figure 1c. Furthermore, the positive coefficient on the interaction of TPS and PI in Table 5 largely outweighs the coefficient on TPS, thereby implying an overall positive association.

[insert Table 6 here]

All specifications with the *CETR* neither produce coefficients with a consistent sign, nor are they statistically significant. The *GETR* measures lead to estimates that change their sign and scatter widely.

In contrast, the coefficients on the interaction term in Table 7 are much more stable. When the *TPS* is calculated based on the *CETR* over 10 years, there is a considerable loss of variation, which is likely the reason for the insignificant coefficient on the interaction. All other estimates remain significant. Interestingly, the magnitude of the effect seems to be systematically lower when *GETR*s are used, and when longer time horizons are considered. Overall, the composite view is nevertheless more robust to the choice of the tax planning measure.[14]

[insert Table 7 here]

5.2.2. Control Settings

An essential problem when performing empirical analyses relying on conditioning approaches is the choice of control variables. Omitted and unobserved variables that are correlated with the dependent and independent variable might confound the observed associations. While the inclusion of firm fixed effects is commonly used to mitigate this problem, it cannot be fully ruled out. Most importantly, over-control bias is a grave danger in the (tax) accounting literature on valuation. Controlling for the market value of assets, or the book-to-market ratio, (e.g., Kim et al. 2011; Goh et al. 2016; Guenther et al. 2017; Sikes and Verrecchia 2020) while the market-to-book ratio is the dependent variable, clearly introduces a potential over-control bias. Furthermore, it dilutes the direction of causality, since it is not clear whether the independent variable influences the dependent variable, or vice versa. The same holds true for control variables that are calculated in a similar way as the dependent variable (e.g., cost of equity, if the stock price is used for approximation). Therefore, the baseline analyses were performed by adding control variables step-by-step. Prior literature has used different control variable settings which makes it difficult to compare the results across studies.

[14] This result holds for performing the analysis with an unbalanced sample (see Table A.4 and Table A.5).

I perform the baseline regressions following 13 different settings as a last robustness test.[15] Figure 2 displays the coefficient estimates for the separate view with the $CETR$ across control settings, while Figure 3 shows the composite view.[16] All models use the same definitions of the main independent variables as the baseline regressions.

[insert Figure 2 here]

First, the estimates for the separate view are distributed over a much larger range compared to the TPS specifications. That is especially the case for the interaction term between tax planning and tax uncertainty. While the coefficients for TP and TU are relatively stable (despite changing their sign across models), the interaction estimate ranges between -7.83 and 22.35. Figure 3 shows that the coefficient on the interaction between TPS and PI only ranges between 0.14 and 0.27.

[insert Figure 3 here]

Second, the coefficients for the separate view are not statistically significant in most settings, marginally significant in 2, and significant at least at the 5%-level in only 3 (see Table A.1 in Appendix A). For the composite view, all coefficients on the interaction term are significant at the 1%-level.

Third, only the composite view produces coefficient magnitudes that are comparable to the baseline specifications and are in line with prior literature. Jacob and Schütt (2020) find a coefficient of 0.196 for the interaction in their preferred specification, which is confidently in the range of my results. Conversely, the separate view produces unreasonably high estimates, even in the scarcely significant models that produce the smallest estimates for TP. A coefficient of -3.65 (column (8) of Table A.1 in Appendix A), for example, would imply that the firm value of the average firm would almost double if the firm reduces its cash effective tax rate by one standard deviation (12 percentage points). Despite a one standard deviation reduction being a large change, the associated (instantaneous) effect on the price to book ratio is arguably unreasonable.

[15] Table 2 outlines the variables used. Due to data limitations, not all variables of studies could be used. However, the specifications were replicated as close as possible and exhibit a considerable variation of settings.

[16] Table A.1 (Table A.2) in Appendix A shows the point estimates for the separate view (composite view). Table A.3 shows the estimates for the separate view when the $GETR$ is used.

Lastly, almost all baseline and control setting specifications of the composite view exhibit a greater explanatory power than the separate view. The columns of the presented table packages can be directly compared to one another (Table 4 with 5; Table A.1 with A.2), which shows that the TPS models' R-squared is higher. Hence, the proportion of variation of the price-to-book ratio that is explained by the respective model is most often systematically higher for the composite view.

5.3. Reconciling the Separate and Composite View

So far, the analyses only replicated the two approaches. Despite the different view on how to account for tax uncertainty, Drake et al. (2019) assume a direct link between tax planning and firm value without interactions with pretax income like Jacob and Schütt (2020). When using the TPS as a measure for (uncertainty weighted) tax planning, the separate view would therefore imply a direct link between TPS and firm value.[17] The TPS can be plugged into Eq. 8 without interaction terms in order to translate the composite view into the Drake et al. (2019) logic:

$$\begin{aligned} PTB_{i,t} = \beta_0 + \beta_1 TPS_{i,t} + \beta_4 PI_{i,t} + \beta_5 VolPI_{i,t} + \beta_6 PI_{i,t} \cdot VolPI_{i,t} \\ + \beta_6 SalesGrowth_{i,t} + \beta_7 X_{i,t} + \alpha_i + \gamma_t + \epsilon_{i,t}, \end{aligned} \tag{10}$$

where β_1 is expected to be positive, since a higher TPS indicates either a higher level or a lower volatility of tax planning (or both).[18]

Similarly, the Jacob and Schütt (2020) logic of an indirect association of tax planning and firm value can be modeled in the separate view by interacting TP and TU with PI

[17]Applying the separate logic of Drake et al. (2019) to the TPS essentially means to simply cut the interactions in the original model of Jacob and Schütt (2020), since the TPS already incorporates the risk dimension of tax planning and its level in one measure, and the separate view directly connects tax planning to firm value.

[18]Note that Eq. 4 makes no prediction regarding the direct effect of TPS on the firm value. The intuition behind the Jacob and Schütt (2020) model would imply, however, that the TPS should be positively associated with the firm value. Figure 1, Panel 1c and Table 8 indeed show such a connection, if the TPS is the main independent variable without interactions.

and adjusting Eq. 8 as following:

$$\begin{aligned}PTB_{i,t} &= \beta_0 + \beta_1 TP_{i,t} + \beta_2 TU_{i,t} + \beta_3 TP_{i,t} \cdot TU_{i,t} + \beta_4 PI_{i,t} + \beta_5 PI_{i,t} \cdot TP_{i,t} \\ &+ \beta_6 PI_{i,t} \cdot TU_{i,t} + \beta_7 PI_{i,t} \cdot TP_{i,t} \cdot TU_{i,t} + \beta_8 VolPI_{i,t} + \beta_9 PI_{i,t} \cdot \\ & VolPI_{i,t} + \beta_{10} SalesGrowth_{i,t} + \beta_{11} X_{i,t} + \alpha_i + \gamma_t + \epsilon_{i,t},\end{aligned} \tag{11}$$

In Eq. 11, the coefficient estimates are not as easy to interpret due to the large number of interaction terms. When isolating the estimate of interest, the triple interaction on β_7 measures how the connection between PI and the firm value is affected by tax planning and uncertainty. Again, β_7 is expected to be positive, since TP and TU should be negative (H1a-c).

As a final step, the TPS can be disassembled by separating the numerator and denominator (Eq. 7) into: $NET = 1 - CETR$ and $InvVolCETR = 1/VolCETR$, respectively. Using these two variables, Eq. 9 and 11 can be combined into:

$$\begin{aligned}PTB_{i,t} &= \beta_0 + \beta_1 PI_{i,t} + \beta_2 NET_{i,t} + \beta_3 InvVolCETR_{i,t} + \beta_4 PI_{i,t} \cdot NET_{i,t} \\ &+ \beta_5 PI_{i,t} \cdot InvVolCETR_{i,t} + \beta_6 PI_{i,t} \cdot NET_{i,t} \cdot InvVolCETR_{i,t} \\ &+ \beta_7 SalesGrowth_{i,t} + \beta_8 X_{i,t} + \alpha_i + \gamma_t + \epsilon_{i,t},\end{aligned} \tag{12}$$

which models the separate view by using the components of the TPS. Eq. 12 allows for an investigation of which component of the TPS, the degree of tax planning (NET) or its uncertainty ($InvVolCETR$), matters (more) in a valuation framework. β_2 is expected to be positive (since NET rises with a higher degree of tax planning), β_3 positive (since $InvVolCETR$ rises with lower values of uncertainty), and β_6 negative.

Table 8 reports the results of estimating Eq. 10. Confirming theoretical considerations that a higher TPS implies higher quality of tax planning (either less risk for a given effective tax rate, or a lower tax rate for a given level of risk, or both), the coefficient estimates in all columns are positive and statistically significant in most models (see also Figure 1c).

[insert Table 8 here]

A general drawback of the TPS by construction is that one cannot be sure how a given TPS value was achieved by a firm. For example, a firm with a TPS of 10 can either have a $CETR$ of 0.3 and a corresponding volatility of 7%, or a $CETR$ of 0.5 with a volatility of 5%.[19] By only looking at the TPS, it is unclear whether the degree of tax planning (numerator, $CETR$) or rather the tax uncertainty (denominator, $VolCETR$) is the main driver behind potential firm value associations. Tables 9 and 10 contain the results of estimating Eq. 11 (using the Drake et al. 2019 measures and interacting them with PI) and Eq. 12 (using the components of the TPS and interacting them with PI), respectively.

[insert Table 9 here]

A comparison of the coefficients on the triple interactions ($TP\#TU\#PI$ and NET $\#InvVolCETR\#PI$) of the two tables reveals that the disassembled TPS (Table 10) yields more theoretically consistent results than Table 9. While the magnitudes and signs of coefficients change substantially in Table 9 across models, they are relatively stable in Table 10 and significant in all specifications without firm fixed effects.

Interestingly, if one compares Table 9 with the baseline replication of the separate view in Table 4, it seems that following the residual income model as a theoretical background by interacting the tax planning and uncertainty measures with pretax income yields more consistent results: The coefficient for TP in Table 9 is negative (implying a positive association with firm value), while the interaction of PI and TU is negative as well (implying that the positive link between PI and firm value is dampened by higher tax uncertainty). Nevertheless, the most important triple interaction is still inconclusive, since the sign and magnitude of the estimate varies widely.

[insert Table 10 here]

Disassembling the Tax Planning Score into its components in Table 10 leads to roughly consistent results with Table 9, but the estimates are more stable across models and the triple interaction is consistent with theory. However, in both tables, there are some deviations from what one would expect according to theory and intuition (see Section 3). For example, a negative (positive) estimate for TU ($InvVolCETR$) would be expected, since higher uncertainty should decrease the firm value, and the interaction between TP (NET) and PI should be negative (positive) if a higher degree of tax planning is associated with higher firm values.

[19] Calculated according to the TPS formula of Eq. 7: $(1-0.3)/0.07 = (1-0.5)/0.05 = 10$

Overall, reconciling the separate and composite view gives rise to three key takeaways: (i) The composite view leads to more stable and consistent empirical results than the separate view. (ii) Backing the separate view with the theoretical background of Jacob and Schütt (2020) produces results that are roughly in line with Drake et al. (2019), but the dependency on modelling choices remains. (iii) Despite the drawback of a composite measure of not being able to be sure whether the degree of tax planning or rather its uncertainty is more important in a valuation framework, the notion of Jacob and Schütt (2020) that they should be considered jointly seems to be the most consistent choice (comparing Tables 9 and 10 with Table 5). This is in line with tax planning having an unique risk-reward-structure, i.e., unlike in the traditional CAPM-logic of higher potential returns being connected to higher risks, high levels of tax planning may be achieved by relatively riskless strategies (Hanlon and Heitzman 2010). Combining the level of tax planning with its uncertainty in one measure accounts at least partly for this challenge.

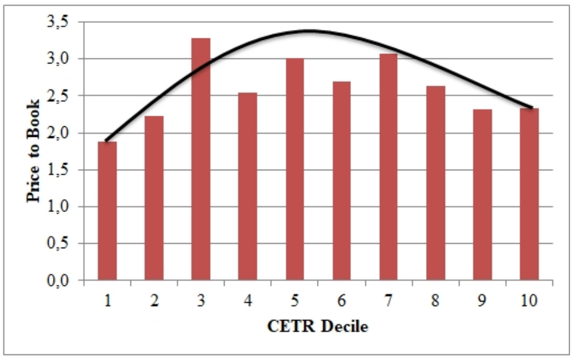
6. Conclusion

Two approaches how to account for tax planning and uncertainty in a valuation framework have recently been developed: the separate view (Drake et al. 2019) and the composite view (Jacob and Schütt 2020). This paper replicates both approaches and applies the logic of the separate view to the framework of the composite view and vice versa to a new setting of publicly listed German firms. I assess both models regarding their robustness across different choices of how to measure tax planning and tax uncertainty, over which time horizons these constructs are used, and how their produced results are affected by different control variable settings. I argue that the composite view is likely to be better suited to capture the association between tax planning and firm value, since it relies on a theoretically sound model and weights tax planning by its uncertainty.

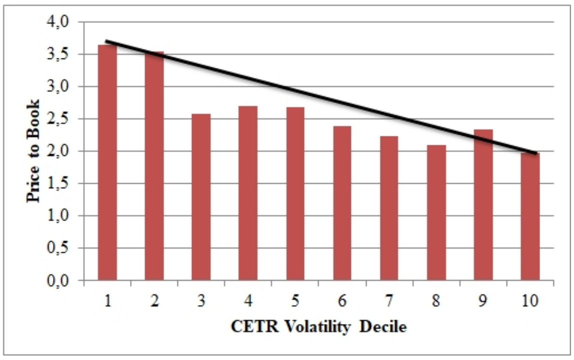
Unlike in the traditional CAPM-logic of a linear risk-reward trade-off, tax planning is unique in that higher levels of tax planning do not necessarily lead to higher tax uncertainty (Guenther et al. 2017). Looking at tax planning and tax uncertainty separately can therefore lead to biased results. In line with this, I am unable to find results consistent with Drake et al. (2019): Neither is the degree of tax planning associated with higher firm values, nor is tax uncertainty significantly moderating this relationship. The battery of robustness tests show that the separate view is largely dependent on the control variable setting and the measurement of tax planning. In contrast, the results for the composite view are consistent with theory and economically substantial: A one standard deviation increase in the quality of tax planning increases the effect of a one standard deviation increase in pretax income on the price-to-book ratio by 7.7%. This result qualitatively and quantitatively holds across a battery of robustness tests. Furthermore, when the separate view is combined with the residual income logic of the composite view, it performs better, thereby providing support for the notion that tax planning (and uncertainty) seems to be indirectly associated with firm value through an income channel, rather than directly.

However, the conclusion that tax planning and uncertainty should be considered jointly in one measure does not come without caveats. By applying composite measures such as the TPS, the incremental role that the level of tax planning and its uncertainty play cannot be distinguished from one another anymore. More research is needed in that regard, since this paper's results indicate that simply separating both concepts in standard conditioning approaches bears the risk of high dependency on arbitrary measurement and control setting choices. Nevertheless, the composite view of Jacob and Schütt (2020) is likely to be beneficial for future empirical studies on the role of corporate tax planning, not only in valuation, but also in other fields of business economics, like the capital structure choice of firms (Faccio and Xu 2015), the determinants of the (equity) cost of capital (Cook et al. 2017), or stock returns (Heitzman and Ogneva 2019), where tax uncertainty has not been accounted for explicitly yet.

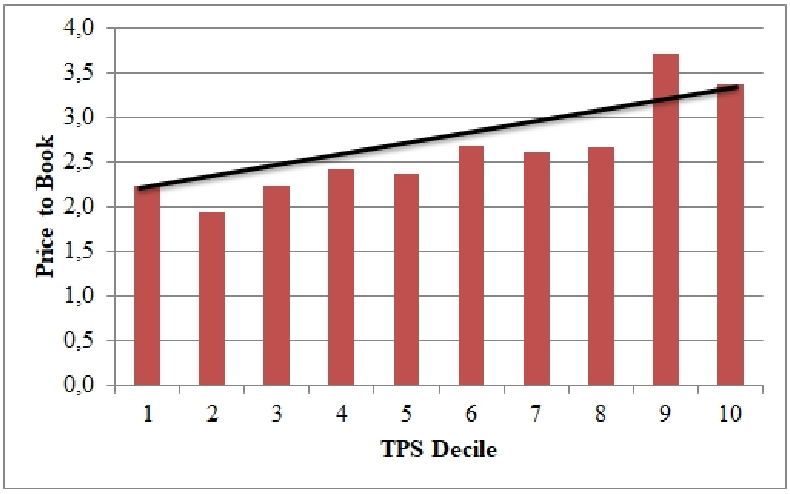
Figures and Tables



(a) *CETR* and *PTB*



(b) *CETR* Volatility and *PTB*



(c) *TPS* and *PTB*

Figure 1: *PTB* and tax planning, tax uncertainty, and *TPS*

Notes: This figure shows the distribution of the price-to-book ratio (*PTB*) over tax planning deciles (cash effective tax rate, *CETR*), tax uncertainty deciles (*CETR* volatility), and Tax Planning Score (*TPS*) deciles. The *CETR* is winsorized at 0 and 1. All other variables are winsorized at the first and 99th percentiles. In Panel (a) the lowest firm value can be found at the lowest *CETR* decile, while the highest values are in the middle of the distribution. Panel (b) shows a clear negative relationship between tax uncertainty and firm value. Higher *TPS* values tend to be associated with higher firm values (Panel c).

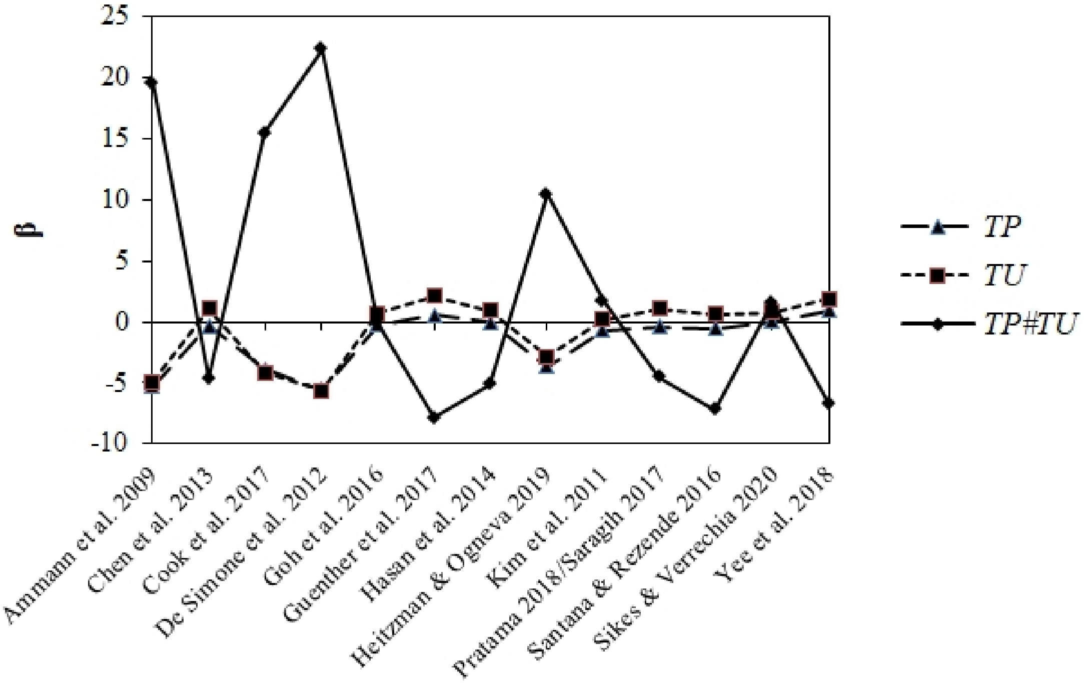


Figure 2: Separate View – Control Settings

Note: This figure presents the results from performing regressions for the separate view (Eq. 8) with altering control variables. The x-axis shows the applied control setting (Table 2). Coefficient estimates for *TP*, *TU*, and their interaction are denoted on the y-axis (Table A.1 in Appendix A. All main variables are defined as in the baseline analysis and are described in more detail in Table 1.

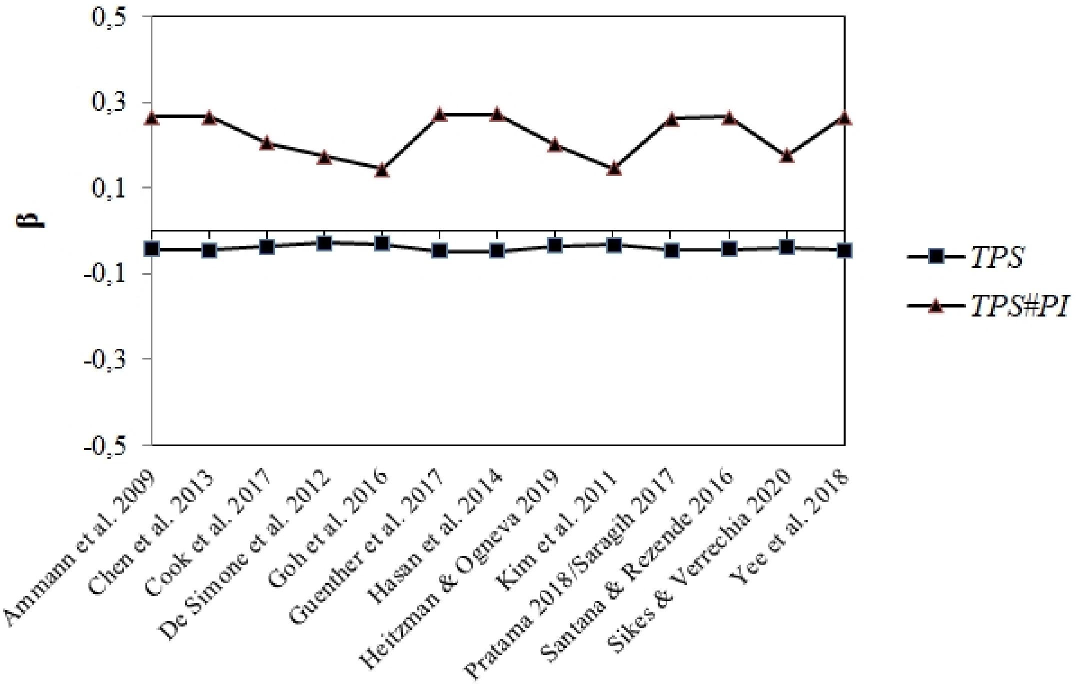


Figure 3: Composite View – Control Settings

Note: This figure presents the results from performing regressions for the composite view (Eq. 9) with altering control variables. The x-axis shows the applied control setting (Table 2). Coefficient estimates for *TPS*, and the interaction with *PI* are denoted on the y-axis (Table A.2 in Appendix A. All main variables are defined as in the baseline analysis and are described in more detail in Table 1.

Table 1: Variable Definitions

Notes: Table 1 shows the detailed description and calculation of the main variables for the baseline analyses. i indexes the firm, while t stands for the time index. The variable definitions are as close as possible to Drake et al. (2019) and Jacob and Schütt (2020). Since the data source is Datastream from Thomson Reuters, some information is not available compared to the aforementioned Compustat studies.

Dependent Variable	**Description**	**Formula**
PTB	Price-to-Book ratio	$PTB_{i,t} = SharePrice_{i,t}/BookValuePerShare_{i,t}$
Tax Planning Variables		
$CETR$	Cash Effective Tax Rate	$CETR_{i,t} = \sum_{z=t-4}^{t}(CashflowTaxation_{i,z}/PretaxIncome_{i,z})$
$GETR$	GAAP Effective Tax Rate	$GETR_{i,t} = \sum_{z=t-4}^{t}(TE_{i,z}/PI_{i,z})$
$VolCETR$	Volatility of CETR	$VolCETR_{i,t} = \sqrt{\sum_{z=t-4}^{t}(CETR_{i,z} - Mean(CETR_i))^2}$
$VolGETR$	Volatility of GETR	$VolGETR_{i,t} = \sqrt{\sum_{z=t-4}^{t}(GETR_{i,z} - Mean(GETR_i))^2}$
TP	Tax Planning	$CETR$ or $GETR$
TU	Tax Uncertainty	$VolCETR$ or $VolGETR$
TPS	Tax Planning Score	$TPS_{i,t} = (1 - CETR_{i,t})/VolCETR_{i,t}$
NET	Net-of-tax-rate	$NET_{i,t} = 1 - CETR_{i,t}$
$InvVolCETR$	Inverse CETR Volatility	$InvVolCETR_{i,t} = 1/VolCETR_{i,t}$
Control Variables		
PI	Pretax Income scaled by Equity	$PI_{i,t} = PretaxIncome_{i,t}/CommonEquity_{i,t}$
$VolPI$	Volatility of PI	$VolPI_{i,t} = \sqrt{\sum_{z=t-4}^{t}(PI_{i,z} - Mean(PI_i))^2}$
CoE	Cost of Equity	$CoE_{i,t} = (SharePrice_{i,t} - SharePrice_{i,t-1})/SharePrice_{i,t-1} + RiskFreeReturn_t$
$SalesGrowth$	Sales Growth	$SalesGrowth_{i,t} = \sum_{z=t-4}^{t}(Sales_{i,z} - Sales_{i,z-1})/\sum_{z=t-4}^{t}Sales_{i,z-1}$
$VolCF$	Cashflow Volatility	$VolCF_{i,t} = \sqrt{\sum_{z=t-4}^{t}(CashFlow_{i,z} - Mean(Cashflow_i))^2}$
$VolP$	Price Volatility	$VolP_{i,t} = \sqrt{\sum_{z=t-4}^{t}(SharePrice_{i,z} - Mean(SharePrice_i))^2}$
$Leverage$	Leverage	$Leverage_{i,t} = (ShortTermDebt_{i,t} + LongTermDebt_{i,t})/CommonEquity_{i,t}$
$Depreciation$	Depreciation	$Depreciation_{i,t} = DepreciationExpenses_{i,t}/TotalAssets_{i,t-1}$

Table 2: Control variables following prior literature

Study	**Control Variables**
Ammann et al. (2011)	Total Assets; Property, Plant and Equipment; Leverage; Ebitda; Cash; Sales Growth; Research and Development; Capital Expenditures
Chen et al. (2014)	Total Assets; Property, Plant and Equipment; Leverage; Sales Growth; Beta; Return on Assets
Cook et al. (2017)	Total Assets; Property, Plant and Equipment; Dividend Yield; Leverage; Book-to-Market; Sales Growth; Return on Assets; Price Volatility; Ebitda Volatility; Research and Development; Capital Expenditures
De Simone and Stomberg (2012)	Sales; Sales Growth; Leverage; Return on Assets; Price Volatility; Research and Development; Capital Expenditures
Goh et al. (2016)	Market Value; Book-to-Market; Leverage; Ebitda; Sales Growth; Beta; Stock Return; Price Volatility; Ebitda Volatility; Capital Expenditures
Guenther et al. (2017)	Total Assets; Leverage; Ebitda; Book-to-Market; Ebitda Volatility; Cashflow Volatility
Hasan et al. (2014)	Total Assets; Leverage; Sales Growth; Return on Assets; Cash; Property, Plant and Equipment; Ebitda Ebitda Volatility
Heitzman and Ogneva (2019)	Total Assets; Property, Plant and Equipment; Leverage; Book-to-Market; Stock Return; Price Volatility; Research and Development; Capital Expenditures
Kim et al. (2011)	Market Value; Sales; Leverage; Return on Assets; Stock Return; Price Volatility
Pratama (2018); Saragih (2017)	Total Assets; Leverage; Return on Assets
Santana and Rezende (2016)	Sales; Property, Plant and Equipment; Long Term Debt; Cashflow
Sikes and Verrecchia (2020)	Market Value, Leverage; Return on Equity; Beta; Book-to-Market; Dividend Yield
Yee et al. (2018)	Total Assets; Leverage; Sales Growth; Return on Assets; Return on Equity

Table 3: Descriptive Statistics

Notes: Descriptive statistics are reported for the baseline variables. All variables, except PTB and TPS can be interpreted in percentage terms. Effective tax rates are winsorized at 0 and 1, while all other variables are winsorized at the first and 99th percentiles. Table 1 contains a detailed variable description along with their calculation.

	count	mean	sd	p25	p50	p75
PTB	1116	2.64	2.31	1.28	1.98	3.02
$CETR$	1116	0.29	0.12	0.24	0.29	0.35
$GETR$	1116	0.30	0.08	0.26	0.30	0.33
$VolCETR$	1116	0.13	0.10	0.06	0.10	0.16
$VolGETR$	1116	0.09	0.16	0.02	0.05	0.10
TPS	1116	11.23	14.52	4.25	7.61	12.59
PI	1116	0.21	0.15	0.12	0.18	0.25
$VolPI$	1116	0.07	0.10	0.02	0.04	0.08
CoE	1116	0.10	0.38	-0.12	0.07	0.27
$SalesGrowth$	1116	0.03	1.05	-0.25	-0.01	0.25
$VolCF$	1116	0.03	0.03	0.01	0.02	0.04
$VolP$	1116	0.12	0.24	0.03	0.07	0.13
$Leverage$	1116	0.21	0.17	0.05	0.19	0.31
$Depreciation$	1116	0.04	0.03	0.03	0.04	0.05

Table 4: Separate View – Baseline

Notes: The dependent variable is the price-to-book ratio. Columns (1)–(3) include year fixed effects; columns (4)–(6) include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
TP	2.162**	1.200	1.191	1.202	1.383	1.248
	(0.924)	(0.921)	(0.921)	(1.192)	(1.171)	(1.176)
TU	1.906	2.466**	2.414*	2.075	2.682*	2.471*
	(1.214)	(1.252)	(1.257)	(1.380)	(1.448)	(1.454)
$TP\#TU$	-9.023**	-4.930	-4.830	-9.367**	-5.492	-5.021
	(3.620)	(3.317)	(3.322)	(4.203)	(3.816)	(3.824)
PI	6.235***	7.534***	7.592***	5.431***	7.160***	7.172***
	(0.369)	(0.664)	(0.672)	(0.394)	(0.744)	(0.764)
$VolPI$	-1.280**	1.374	1.402	-0.514	3.250**	3.397***
	(0.631)	(1.158)	(1.164)	(0.768)	(1.292)	(1.305)
$PI\#VolPI$		-6.647***	-6.682***		-6.975***	-7.117***
		(1.060)	(1.074)		(1.178)	(1.202)
$TP\#VolPI$		9.011*	8.692*		1.572	1.843
		(4.202)	(4.229)		(5.411)	(5.460)
$TU\#VolPI$		-15.541***	-15.276***		-18.136**	-17.878**
		(5.613)	(5.626)		(7.331)	(7.352)
$SalesGrowth$		0.005	0.005		0.023	0.024
		(0.033)	(0.033)		(0.034)	(0.034)
$VolCF$		5.825***	5.857***		5.655**	5.424**
		(2.236)	(2.238)		(2.570)	(2.573)
$PI\#VolCF$		-12.950*	-13.311**		-12.083*	-11.726
		(6.719)	(6.745)		(7.260)	(7.313)
$VolP$		-1.738***	-1.736***		0.713	0.727
		(0.494)	(0.494)		(0.805)	(0.804)
$PI\#VolP$		15.759***	15.697***		10.813***	10.870***
		(1.841)	(1.844)		(2.324)	(2.323)
$Leverage$			-0.188			0.908*
			(0.403)			(0.539)
$Depreciation$			1.879			-1.327
			(2.775)			(4.200)
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	1,116	1,116	1,116	1,116
R-squared	0.331	0.466	0.465	0.335	0.477	0.478

Table 5: Composite View – Baseline

Notes: The dependent variable is the price-to-book ratio. Columns (1)–(3) include year fixed effects; columns (4)–(6) include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
PI	3.110***	2.285***	2.291***	2.573***	1.944***	1.820***
	(0.430)	(0.568)	(0.571)	(0.472)	(0.615)	(0.619)
TPS	-0.037***	-0.034***	-0.035***	-0.042***	-0.037***	-0.037***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
$TPS\#PI$	0.240***	0.191***	0.192***	0.265***	0.205***	0.203***
	(0.028)	(0.029)	(0.029)	(0.034)	(0.034)	(0.034)
$SalesGrowth$	-0.026	-0.018	-0.020	-0.028	-0.012	-0.007
	(0.047)	(0.043)	(0.043)	(0.049)	(0.045)	(0.045)
$SalesGrowth\#TPS$	0.003	0.001	0.001	0.004**	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CoE	0.963***	0.923***	0.922***	0.956***	0.882***	0.893***
	(0.110)	(0.102)	(0.103)	(0.113)	(0.105)	(0.105)
$VolCF$		5.098**	5.067**		3.870	3.823
		(2.316)	(2.319)		(2.597)	(2.595)
$TPS\#VolCF$		0.333*	0.334*		0.429**	0.415**
		(0.173)	(0.173)		(0.197)	(0.197)
$VolP$		-1.910***	-1.909***		-0.121	-0.080
		(0.485)	(0.483)		(0.760)	(0.760)
$TPS\#VolP$		-0.022	-0.023		-0.028	-0.028
		(0.017)	(0.017)		(0.017)	(0.017)
$PI\#VolCF$		-14.956**	-15.052**		-11.925*	-10.770
		(6.518)	(6.544)		(7.018)	(7.041)
$PI\#VolP$		17.813***	17.732***		14.095***	14.045***
		(1.861)	(1.866)		(2.219)	(2.222)
$Leverage$			-0.498			0.564
			(0.395)			(0.502)
$Depreciation$			-0.186			-6.790*
			(2.744)			(3.909)
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	1,116	1,116	1,116	1,116
R-squared	0.404	0.521	0.519	0.430	0.525	0.527

Table 6: Separate View – Robustness

Notes: The dependent variable is the price-to-book ratio. All specifications include year and firm fixed effects, as well as all baseline control variables. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	CETR	CETR	CETR	CETR	GETR	GETR	GETR	GETR
	3y	5y	8y	10y	3y	5y	8y	10y
TP	0.538	1.248	2.935	-0.900	-1.758**	-0.433	5.180**	5.573**
	(0.811)	(1.176)	(2.642)	(5.034)	(0.887)	(1.167)	(2.031)	(2.712)
TU	1.385	2.471*	7.132**	2.128	-0.910	0.235	0.207	0.225
	(1.028)	(1.454)	(3.380)	(6.771)	(1.136)	(1.115)	(1.504)	(1.852)
$TP\#TU$	-2.475	-5.021	-18.402*	-8.303	3.100	-0.747	-3.068	-0.621
	(2.486)	(3.824)	(9.650)	(19.429)	(1.977)	(2.208)	(4.211)	(5.659)
PI, VolPI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	686	445	1,116	1,116	825	636
R-squared	0.477	0.478	0.501	0.470	0.485	0.480	0.538	0.563

Table 7: Composite View – Robustness

Notes: The dependent variable is the price-to-book ratio. All specifications include year and firm fixed effects, as well as all baseline control variables. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	TPS	TPS	TPS	TPS	TPS	TPS	TPS	TPS
	CETR	CETR	CETR	CETR	GETR	GETR	GETR	GETR
	3y	5y	8y	10y	3y	5y	8y	10y
PI	3.703***	1.820***	2.518**	2.690	3.800***	3.588***	1.849***	1.029
	(0.532)	(0.619)	(1.195)	(1.642)	(0.501)	(0.507)	(0.581)	(0.832)
TPS	-0.004	-0.037***	-0.072***	-0.087*	-0.002**	-0.006**	-0.018**	-0.014
	(0.003)	(0.008)	(0.024)	(0.048)	(0.001)	(0.003)	(0.007)	(0.011)
$TPS\#PI$	0.020*	0.203***	0.325***	0.218	0.011***	0.038***	0.117***	0.080***
	(0.011)	(0.034)	(0.088)	(0.144)	(0.002)	(0.007)	(0.022)	(0.030)
PI, VolPI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	686	445	1,116	1,116	825	636
R-squared	0.501	0.527	0.523	0.471	0.522	0.526	0.571	0.562

Table 8: TPS – Separate View

Notes: The dependent variable is the price-to-book ratio. Columns (1)–(3) include year fixed effects; columns (4)–(6) include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
PI	6.279***	7.319***	7.413***	5.585***	6.968***	6.995***
	(0.355)	(0.647)	(0.656)	(0.375)	(0.716)	(0.734)
TPS	0.009**	0.005	0.005	0.016***	0.010**	0.010**
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Risk Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	1,116	1,116	1,116	1,116
R-squared	0.334	0.467	0.466	0.338	0.475	0.477

Table 9: Separate View – Interaction with PI

Notes: The dependent variable is the price-to-book ratio. Columns (1)–(3) include year fixed effects; columns (4)–(6) include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
PI	2.040*	5.832***	5.898***	2.927**	7.133***	7.339***
	(1.157)	(1.596)	(1.599)	(1.260)	(1.824)	(1.835)
TP	-4.346***	-1.403	-1.459	-3.744***	-0.010	0.040
	(1.128)	(1.251)	(1.250)	(1.371)	(1.529)	(1.533)
TU	6.050***	6.714***	6.640***	7.539***	9.224***	9.115***
	(1.593)	(1.582)	(1.582)	(1.875)	(1.948)	(1.952)
$TP\#TU$	2.538	-4.270	-4.086	-1.864	-9.703*	-9.791*
	(4.617)	(4.585)	(4.584)	(5.350)	(5.362)	(5.371)
$TP\#PI$	39.969***	19.503***	19.757***	33.873***	13.877**	13.409**
	(4.617)	(5.393)	(5.395)	(4.987)	(6.028)	(6.042)
$TU\#PI$	-22.526***	-36.181***	-36.611***	-29.164***	-45.251***	-45.863***
	(7.392)	(7.898)	(7.909)	(8.699)	(9.097)	(9.134)
$TP\#TU\#PI$	-57.535**	7.134	7.714	-41.308	29.886	32.965
	(23.362)	(24.202)	(24.246)	(25.705)	(27.032)	(27.177)
Risk Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	1,116	1,116	1,116	1,116
R-squared	0.428	0.512	0.511	0.432	0.526	0.527

Table 10: Disassembled TPS

Notes: The dependent variable is the price-to-book ratio. Columns (1)–(3) include year fixed effects; columns (4)–(6) include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
PI	17.194***	13.169***	13.640***	15.233***	13.234***	13.471***
	(2.341)	(2.386)	(2.411)	(2.663)	(2.645)	(2.679)
NET	2.062***	0.760	0.781	2.655***	0.840	0.869
	(0.623)	(0.697)	(0.697)	(0.746)	(0.803)	(0.804)
$InvVolCETR$	-0.150***	-0.116***	-0.117***	-0.129***	-0.088**	-0.085**
	(0.029)	(0.028)	(0.028)	(0.039)	(0.040)	(0.040)
$NET\#InvVolCETR$	0.134***	0.104***	0.105***	0.108**	0.064	0.061
	(0.034)	(0.033)	(0.033)	(0.051)	(0.052)	(0.052)
$NET\#PI$	-17.848***	-12.111***	-12.646***	-16.222***	-12.692***	-12.827***
	(3.022)	(3.247)	(3.267)	(3.512)	(3.617)	(3.637)
$InvVolCETR\#PI$	0.750***	0.572***	0.560***	0.578***	0.353*	0.342
	(0.157)	(0.153)	(0.153)	(0.208)	(0.211)	(0.211)
$NET\#InvVolCETR\#PI$	-0.658***	-0.496**	-0.476**	-0.427	-0.196	-0.184
	(0.203)	(0.196)	(0.196)	(0.279)	(0.279)	(0.279)
Risk Controls	No	Yes	Yes	No	Yes	Yes
Other Controls	No	No	Yes	No	No	Yes
Firm FE	No	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,116	1,116	1,116	1,116	1,116
R-squared	0.435	0.513	0.512	0.439	0.524	0.525

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Appendices

A. Additional Analyses and Statistics

A.1. Control Settings

Table 2 in the main text shows the different control settings that were used to produce Tables A.1 and A.2, whose results are depicted in the main paper in Figures 2 (for the separate view) and 3 (for the composite view). Table A.3 reports results from performing the same exercise when the $GETR$ instead of the $CETR$ is used as tax planning measure. In general, the remarks from the $CETR$ analyses hold also for the $GETR$, despite its coefficients being slightly more stable in size.

Table A.1: Separate View CETR – Control Settings

Notes: The dependent variable is the price-to-book ratio. Column (1) refers to the control setting following Ammann et al. (2011), column (2) Chen et al. (2014), column (3) Cook et al. (2017), column (4) De Simone and Stomberg (2012), column (5) Goh et al. (2016), column (6) Guenther et al. (2017), column (7) Hasan et al. (2014), column (8) Heitzman and Ogneva (2019), column (9) Kim et al. (2011), column (10) Pratama (2018); Saragih (2017), column (11) Santana and Rezende (2016), column (12) Sikes and Verrecchia (2020), and column (13) Yee et al. (2018). All specifications include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TP	-5.230***	-0.287	-3.869**	-5.523***	-0.213	0.602	-0.060
	(1.896)	(1.217)	(1.580)	(1.675)	(0.952)	(1.203)	(1.276)
TU	-4.860**	1.073	-4.156**	-5.636***	0.709	2.121	0.914
	(2.181)	(1.418)	(1.848)	(1.959)	(1.100)	(1.393)	(1.469)
$TP\#TU$	19.599***	-4.630	15.477**	22.351***	-0.081	-7.831*	-5.108
	(7.192)	(4.348)	(6.006)	(6.444)	(3.379)	(4.241)	(4.522)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	633	1,116	618	641	1,075	1,075	1,064
R-squared	0.318	0.303	0.536	0.424	0.613	0.374	0.312

	(8)	(9)	(10)	(11)	(12)	(13)
TP	-3.650**	-0.665	-0.409	-0.521	0.076	0.901
	(1.515)	(0.926)	(1.219)	(1.276)	(0.898)	(1.169)
TU	-2.803	0.165	1.049	0.630	0.762	1.911
	(1.765)	(1.082)	(1.421)	(1.498)	(1.044)	(1.357)
$TP\#TU$	10.437*	1.748	-4.507	-7.200	1.567	-6.663
	(5.810)	(3.322)	(4.354)	(4.552)	(3.204)	(4.156)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	641	1,116	1,116	1,116	1,116	1,116
R-squared	0.535	0.598	0.296	0.230	0.626	0.363

Table A.2: Composite View – Control Settings

Notes: The dependent variable is the price-to-book ratio. Column (1) refers to the control setting following Ammann et al. (2011), column (2) Chen et al. (2014), column (3) Cook et al. (2017), column (4) De Simone and Stomberg (2012), column (5) Goh et al. (2016), column (6) Guenther et al. (2017), column (7) Hasan et al. (2014), column (8) Heitzman and Ogneva (2019), column (9) Kim et al. (2011), column (10) Pratama (2018); Saragih (2017), column (11) Santana and Rezende (2016), column (12) Sikes and Verrecchia (2020), and column (13) Yee et al. (2018). All specifications include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PI	3.598***	1.950***	1.038	3.350***	3.484***	0.152	1.754***
	(1.022)	(0.594)	(0.956)	(0.976)	(0.574)	(0.676)	(0.615)
TPS	-0.044***	-0.046***	-0.036***	-0.028*	-0.031***	-0.048***	-0.047***
	(0.015)	(0.008)	(0.014)	(0.014)	(0.007)	(0.009)	(0.009)
$TPS\#PI$	0.267***	0.265***	0.204***	0.173***	0.143***	0.273***	0.273***
	(0.060)	(0.034)	(0.054)	(0.057)	(0.027)	(0.034)	(0.035)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	633	1,116	618	641	1,075	1,075	1,064
R-squared	0.393	0.412	0.556	0.455	0.668	0.437	0.420

	(8)	(9)	(10)	(11)	(12)	(13)
PI	1.295*	2.569***	1.997***	2.534***	1.981***	1.983***
	(0.663)	(0.454)	(0.595)	(0.510)	(0.419)	(0.595)
TPS	-0.035***	-0.032***	-0.045***	-0.043***	-0.038***	-0.046***
	(0.013)	(0.006)	(0.008)	(0.009)	(0.007)	(0.008)
$TPS\#PI$	0.201***	0.147***	0.262***	0.267***	0.175***	0.267***
	(0.051)	(0.026)	(0.034)	(0.034)	(0.027)	(0.034)
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	641	1,116	1,116	1,116	1,116	1,116
R-squared	0.573	0.659	0.407	0.387	0.639	0.408

Table A.3: Separate View GETR – Control Settings

Notes: The dependent variable is the price-to-book ratio. Column (1) refers to the control setting following Ammann et al. (2011), column (2) Chen et al. (2014), column (3) Cook et al. (2017), column (4) De Simone and Stomberg (2012), column (5) Goh et al. (2016), column (6) Guenther et al. (2017), column (7) Hasan et al. (2014), column (8) Heitzman and Ogneva (2019), column (9) Kim et al. (2011), column (10) Pratama (2018); Saragih (2017), column (11) Santana and Rezende (2016), column (12) Sikes and Verrecchia (2020), and column (13) Yee et al. (2018). All specifications include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TP	-0.139	1.091	1.102	-0.883	3.660***	2.074*	0.869
	(1.855)	(1.208)	(1.574)	(1.666)	(0.931)	(1.191)	(1.252)
TU	-4.118**	-0.927	-1.960	-4.953***	0.417	0.673	-1.037
	(1.733)	(1.035)	(1.479)	(1.567)	(0.794)	(1.009)	(1.058)
$TP\#TU$	10.089**	-0.759	3.404	12.882***	-2.360	-4.568*	-0.711
	(4.510)	(2.490)	(3.843)	(4.089)	(1.910)	(2.422)	(2.545)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	633	1,116	618	641	1,075	1,075	1,064
R-squared	0.318	0.308	0.534	0.426	0.620	0.380	0.318

	(8)	(9)	(10)	(11)	(12)	(13)
TP	1.295	3.214***	0.890	-0.345	3.623***	1.587
	(1.518)	(0.913)	(1.206)	(1.263)	(0.883)	(1.150)
TU	-1.238	-0.273	-0.850	-1.174	0.108	-0.211
	(1.432)	(0.782)	(1.035)	(1.091)	(0.764)	(0.987)
$TP\#TU$	1.768	-0.616	-0.971	-1.152	-1.193	-2.189
	(3.750)	(1.881)	(2.487)	(2.621)	(1.836)	(2.370)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	641	1,116	1,116	1,116	1,116	1,116
R-squared	0.532	0.606	0.301	0.232	0.631	0.369

A.2. Unbalanced Sample

This section displays results of performing the baseline analyses with an "unbalanced" sample, i.e., the sample was not required to have non-missing values for all variables of interest. Especially, this leads to the $GETR$ specifications having substantially more observations, since most of the missing information stems from the $CETR$ calculations (the variable $CashflowTaxation$ in Datastream is often missing).

Table A.4 replicates Table 6, while Table A.5 does the same for Table 7. The composite view still remains the more robust approach – the separate models produce coefficients with the wrong signs, while the interaction $TP\#TU$ ist mostly not significant.

Table A.6 (A.7) replicates Table A.1 (A.2). The TPS interaction terms remain stable in size and highly significant in Table A.7, while the estimated magnitudes vary considerably across models in Table A.6 (albeit not as much as with the balanced sample).

Table A.4: Separate View – Unbalanced

Notes: The dependent variable is the price-to-book ratio. All specifications include year and firm fixed effects, as well as all baseline control variables. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	CETR 3y	CETR 5y	CETR 8y	CETR 10y	GETR 3y	GETR 5y	GETR 8y	GETR 10y
TP	1.457***	3.196***	3.318	2.017	2.705***	1.860***	3.578***	3.985**
	(0.576)	(0.959)	(2.194)	(4.586)	(0.685)	(0.552)	(1.145)	(1.589)
TU	1.115*	3.021***	4.459*	4.836	0.197	-0.973*	0.486	0.330
	(0.657)	(1.019)	(2.622)	(6.046)	(0.685)	(0.500)	(0.985)	(1.526)
$TP\#TU$	-3.227*	-9.435***	-14.01*	-16.53	-1.212	0.764	-1.247	0.772
	(1.702)	(3.193)	(8.092)	(18.15)	(1.610)	(0.889)	(2.808)	(4.562)
PI, VolPI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,783	1,401	748	462	3,191	3,467	2,065	1,503
R-squared	0.410	0.440	0.526	0.504	0.298	0.278	0.361	0.397
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A.5: Composite View – Unbalanced

Notes: The dependent variable is the price-to-book ratio. All specifications include year and firm fixed effects, as well as all baseline control variables. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	TPS CETR 3y	TPS CETR 5y	TPS CETR 8y	TPS CETR 10y	TPS GETR 3y	TPS GETR 5y	TPS GETR 8y	TPS GETR 10y
PI	5.110***	2.796***	3.889***	3.817***	4.544***	3.643***	1.967***	2.956***
	(0.259)	(0.430)	(0.843)	(1.391)	(0.245)	(0.297)	(0.407)	(0.500)
TPS	-0.001	-0.037***	-0.045**	0.001	-0.002***	-0.007***	-0.039***	-0.040***
	(0.001)	(0.007)	(0.023)	(0.047)	(0.001)	(0.002)	(0.006)	(0.001)
$TPS\#PI$	0.006	0.218***	0.302***	0.169	0.0120***	0.050***	0.190***	0.179***
	(0.005)	(0.032)	(0.071)	(0.144)	(0.002)	(0.006)	(0.019)	(0.029)
PI, VolPI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,073	1,403	748	462	3,839	3,000	2,065	1,503
R-squared	0.410	0.474	0.548	0.466	0.322	0.360	0.400	0.410
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A.6: Separate View CETR – Control Settings Unbalanced

Notes: The dependent variable is the price-to-book ratio. Column (1) refers to the control setting following Ammann et al. (2011), column (2) Chen et al. (2014), column (3) Cook et al. (2017), column (4) De Simone and Stomberg (2012), column (5) Goh et al. (2016), column (6) Guenther et al. (2017), column (7) Hasan et al. (2014), column (8) Heitzman and Ogneva (2019), column (9) Kim et al. (2011), column (10) Pratama (2018); Saragih (2017), column (11) Santana and Rezende (2016), column (12) Sikes and Verrecchia (2020), and column (13) Yee et al. (2018). All specifications include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
TP	-0.775	1.420	0.615	-0.670	1.298	2.213**	2.194**
	(1.422)	(0.917)	(1.332)	(1.383)	(0.804)	(0.910)	(0.967)
TU	0.605	2.830***	0.521	0.424	1.500	3.123***	3.402***
	(1.668)	(1.021)	(1.517)	(1.582)	(0.932)	(1.033)	(1.094)
$TP\#TU$	0.784	-9.686***	-0.053	2.395	-3.497	-11.106***	-11.825***
	(5.425)	(3.229)	(4.947)	(5.181)	(2.942)	(3.208)	(3.408)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	857	1,480	804	833	1,342	1,401	1,387
R-squared	0.271	0.262	0.469	0.370	0.560	0.343	0.271

	(8)	(9)	(10)	(11)	(12)	(13)
TP	0.785	0.812	1.545*	1.486	1.055	2.692***
	(1.313)	(0.784)	(0.919)	(0.951)	(0.714)	(0.884)
TU	0.889	1.119	2.899***	2.544**	1.932**	3.842***
	(1.497)	(0.909)	(1.027)	(1.061)	(0.791)	(0.984)
$TP\#TU$	-4.196	-1.968	-10.380***	-11.202***	-2.667	-12.633***
	(4.877)	(2.880)	(3.238)	(3.348)	(2.515)	(3.099)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	833	1,403	1,482	1,482	1,480	1,482
R-squared	0.438	0.547	0.250	0.203	0.561	0.318

Table A.7: Composite View CETR – Control Settings Unbalanced

Notes: The dependent variable is the price-to-book ratio. Column (1) refers to the control setting following Ammann et al. (2011), column (2) Chen et al. (2014), column (3) Cook et al. (2017), column (4) De Simone and Stomberg (2012), column (5) Goh et al. (2016), column (6) Guenther et al. (2017), column (7) Hasan et al. (2014), column (8) Heitzman and Ogneva (2019), column (9) Kim et al. (2011), column (10) Pratama (2018); Saragih (2017), column (11) Santana and Rezende (2016), column (12) Sikes and Verrecchia (2020), and column (13) Yee et al. (2018). All specifications include year and firm fixed effects. Standard errors are reported in parantheses. ***, ***, and * indicate significance levels of 0.01, 0.05, and 0.1, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PI	4.155***	2.307***	1.405*	3.185***	2.736***	0.669	2.082***
	(0.861)	(0.500)	(0.836)	(0.853)	(0.521)	(0.543)	(0.536)
TPS	-0.027**	-0.040***	-0.035***	-0.030**	-0.033***	-0.041***	-0.043***
	(0.012)	(0.007)	(0.012)	(0.013)	(0.007)	(0.008)	(0.008)
$TPS\#PI$	0.159***	0.214***	0.178***	0.156***	0.145***	0.217***	0.230***
	(0.047)	(0.030)	(0.050)	(0.052)	(0.027)	(0.031)	(0.032)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	857	1,480	804	833	1,342	1,401	1,387
R-squared	0.330	0.347	0.489	0.405	0.602	0.384	0.352

	(8)	(9)	(10)	(11)	(12)	(13)
PI	2.602***	2.549***	2.393***	2.809***	2.480***	2.398***
	(0.563)	(0.426)	(0.497)	(0.423)	(0.354)	(0.498)
TPS	-0.034***	-0.033***	-0.040***	-0.040***	-0.032***	-0.040***
	(0.012)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)
$TPS\#PI$	0.176***	0.147***	0.216***	0.219***	0.135***	0.216***
	(0.048)	(0.026)	(0.030)	(0.030)	(0.024)	(0.030)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	833	1,403	1,482	1,482	1,480	1,482
R-squared	0.504	0.604	0.339	0.342	0.567	0.339

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