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Does Tax Risk Affect Investor Valuation of Tax Avoidance?

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Abstract

We examine how investors value tax avoidance (measured as the level of cash effective tax rates [ETRs]) and tax risk (measured as the volatility of cash ETRs), and how these constructs interact to influence firm value. Our results suggest that investors positively value tax avoidance but negatively value tax risk and, most importantly, that greater tax risk moderates the positive valuation of tax avoidance. In additional analyses, we find that contemporaneous measures of tax avoidance and tax risk provide insight into future tax cash flows and that our results hold using GAAP ETR-based measures of tax avoidance and tax risk. Finally, our results are robust to a battery of sensitivity checks including controlling for idiosyncratic and systematic risk, the cost of equity capital, and unrecognized tax benefits in the post-FIN 48 period, among others. Broadly, our findings provide new evidence on how taxes affect firm value and suggest that tax avoidance and tax risk should be considered jointly rather than in isolation.

Keywords

corporate tax avoidance, tax risk, firm valuation, uncertain tax positions

Introduction

Investors have recently expressed heightened interest in firms' tax avoidance activities (e.g., Marriage, 2014a, 2014b; Rampell, 2014), and evidence suggests that investment managers consider a firm's tax management practices when making investment decisions. Likewise, investors and analysts are concerned about the pricing of firms' tax avoidance strategies (Carlson, 2015). For example, as one chief investment officer notes,

> We do not single out tax activity as the sole driver of an investment decision, but it can and does influence us alongside other things. Sustainability of any business model is key, and

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> volatile approaches to tax management and unpredictable tax rates detracts from this. (Marriage, 2014a, p. 6)

Despite substantial literature on outcomes associated with corporate tax avoidance, including managerial reputation (Gallemore, Maydew, & Thornock, 2014), costs of debt and equity (e.g., Goh, Lee, Lim, & Shevlin, 2016; Hasan, Hoi, Wu, & Zhang, 2014), financial transparency (Balakrishnan, Blouin, & Guay, 2012), and stock price crash risk (Kim, Li, & Zhang, 2011), there remains limited evidence on how investors value corporate tax outcomes. We add to this literature by examining how tax avoidance and tax risk interact to influence firm value.

Although our main interest in this study is the joint effect of tax avoidance and tax risk on firm value, we first consider prior research on the valuation of tax avoidance,[1] which primarily focuses on whether investor valuation of the level of tax avoidance varies cross-sectionally with corporate governance (Desai & Dharmapala, 2009) or the sources of tax avoidance (e.g., Inger, 2014). To the extent that corporate tax avoidance increases shareholders' expectations of future cash flows, we expect tax avoidance to be positively associated with firm value. However, unlike the reduction of expenses that influence pretax income, the explicit reduction of tax expense is not a component of the core operations of the company. In addition, unlike many other expenses of a firm, taxes are monitored by third parties (Hoopes, Mescall, & Pittman, 2012), and investors may perceive tax avoidance as a firm not paying its ''fair share'' to the government (Dyreng, Hoopes, & Wilde, 2016). Finally, more aggressive forms of tax avoidance may bear reputational costs (Hanlon & Slemrod, 2009) or lead to future economic outlays in the form of repayment of taxes, interest, and penalties. Thus, while some studies document negative outcomes associated with certain forms of tax avoidance, overall we expect tax avoidance to be positively associated with firm value.

Next, we consider tax avoidance in the context of tax risk. Although there is not yet a general consensus on the definition of the term *tax risk* in the literature, we focus on a view of tax risk that is akin to the traditional view in classical finance in which risk refers to the dispersion of potential outcomes from an investment. For example, while Markowitz (1952) does not offer a formal definition of risk, he posits, ''the investor does (or should) consider expected return a desirable thing and variance of return an undesirable thing'' (p. 77). Likewise, Brealey, Myers, and Allen (2011) note, ''we use variance or standard deviation to summarize the spread of potential outcomes. These measures are natural indexes of risk'' (p. 165). Concurrent literature suggests that tax avoidance may not be sustainable (e.g., McGuire, Neuman, & Omer, 2013; Saavedra, 2017). Accordingly, recent studies proxy for tax risk using the standard deviation of firms' annual cash effective tax rates (ETRs; e.g., Guenther, Matsunaga, & Williams, 2017; Hutchens & Rego, 2015). Given that this measure of tax risk represents variance in cash savings from tax avoidance, we expect tax risk to be negatively associated with firm value.

Next, because firms may achieve a certain level of tax avoidance with varying degrees of tax risk, we believe it is important to *jointly* consider the effects of tax avoidance and tax risk on firm value; the interaction of these two constructs is the primary focus of our study. To the extent that investors positively value tax avoidance, we expect investors to prefer consistent, sustainable tax avoidance. However, to the extent that a firm's tax avoidance is volatile (what we term *tax risk*), investors may have difficulty forming expectations of future tax avoidance. Thus, we predict that investor valuation of tax avoidance will be

dependent on the associated level of tax risk. In particular, we expect tax risk to moderate the positive valuation of tax avoidance.

We investigate our research questions using a broad sample of profitable firms over the period 1992 to 2014. Following Dyreng, Hanlon, and Maydew (2008), we measure tax avoidance using the 5-year cash ETR, and following Guenther et al. (2017) and Hutchens and Rego (2015),[2] we measure tax risk using the standard deviation of annual cash ETRs over the same period. Consistent with our expectations, we find a positive association between firm value (measured using Tobin's q) and tax avoidance, and a negative association between firm value and tax risk. Of primary interest in our study, we then document that tax risk moderates the positive valuation of tax avoidance. Specifically, the expected Tobin's q for a firm at the sample mean for all variables in our regression model is 1.79. All else equal, our results indicate that if our mean firm were to increase its tax avoidance by one standard deviation (which would approximately equate to moving from the U.S. statutory tax rate of 35% to a tax rate of 21%) then the firm's expected Tobin's q would be 1.91, representing a predicted increase in firm value of 6.70%. However, if the one standard deviation increase in tax avoidance were combined with a one standard deviation increase in tax risk, we find that the increase in Tobin's q would only be 4.47%.[3] Therefore, our results suggest that the increase in firm value from a one standard deviation increase in tax avoidance is 33.28% smaller if the increase in tax avoidance is coupled with a corresponding increase in tax risk. We also note that a one standard deviation increase in tax avoidance would need to be coupled with an approximately 2.5 standard deviation increase in tax risk to fully offset the positive valuation of avoidance.

We next examine whether our measures of tax avoidance and tax risk provide insight into firms' future tax cash flows. Consistent with the implication of our primary findings that investors appear to update their expectations of future tax cash flows based on contemporaneous measures of tax avoidance and tax risk, we find that the 5-year cash ETR and the 5-year standard deviation of annual cash ETRs measured over the years $t - 4$ to t are significant predictors of tax avoidance and tax risk measured over the years $t + 1$ to $t + 5$. Furthermore, we find that tax risk moderates the positive association between current and future tax avoidance, providing evidence of one mechanism that could lead investors to discount the expected future cash savings associated with tax avoidance when it is coupled with tax risk. Although Guenther et al. (2017) show that tax risk is associated with firm risk (the denominator of the price equation),[4] we complete the picture by documenting that both the level and volatility of cash ETRs provide information about future cash flows (the numerator of the price equation).

Our final additional analysis focuses on GAAP ETR-based measures of tax avoidance and tax risk rather than the cash ETR measures used in our primary tests. Although recent literature focuses on variation in cash taxes paid (e.g., Guenther et al., 2017; McGuire et al., 2013), survey evidence provided by Graham, Hanlon, Shevlin, and Shroff (2014) suggests that firms and managers focus more on GAAP ETRs and low volatility of GAAP ETRs, than they do on the level and volatility of cash ETRs. When examining GAAP ETRs, we find results consistent with those of our primary tests, namely, that tax risk moderates the positive valuation of tax avoidance.

In untabulated robustness and sensitivity analyses, we find that our primary results hold in the post-FIN 48 period including a measure of disclosed unrecognized tax benefits (UTBs). In addition, our results are robust to including various controls for risk, including idiosyncratic risk, systematic risk, and the cost of equity capital. Finally, our results are robust to numerous alternate specifications including using an alternative scalar for our tax

avoidance proxy, using an alternative firm value proxy, industry-year adjusting our tax avoidance and tax risk proxies, and including firm fixed effects instead of industry fixed effects.

Overall, our study contributes to the literature on investor valuation of corporate tax outcomes by demonstrating empirically that while tax avoidance is positively valued on average, greater tax risk significantly moderates this positive valuation. In this way, we provide evidence that tax risk is an important determinant of investor valuation of corporate tax avoidance. Our results suggest that firms face a risk-reward trade-off in which the expected cash savings generated from a particular tax avoidance strategy need to be compared with the risk the strategy induces. In addition, our research contributes to the emerging literature stream on the construct of tax risk. Framing tax risk consistent with classical finance theory as the dispersion of potential outcomes from an investment, we find that tax risk is negatively valued, thereby increasing our understanding of the consequences to the firm of this facet of tax risk.

Furthermore, our results suggest that tax avoidance and tax risk are distinct constructs that should be measured separately. This conclusion complements the findings of Guenther et al. (2017), who identify that low ETRs (tax avoidance) are not associated with higher volatility of ETRs (tax risk) or higher overall firm risk, and Neuman (2016), who argues that not all firms pursue tax minimization and indeed forego some tax avoidance opportunities in favor of less volatile, more sustainable tax strategies. Our results also demonstrate the importance of examining tax avoidance and tax risk simultaneously, rather than in isolation.

The remainder of this article proceeds as follows. The next section discusses prior literature on tax avoidance and tax risk and develops our hypotheses. Subsequent sections discuss our research design, the results of our primary tests, and the results of additional analyses. The final section concludes.

Hypotheses Development

Although our primary interest in this study is the joint effect of tax avoidance and tax risk, we first summarize the literature on each construct separately and formulate two baseline hypotheses before addressing our main hypothesis regarding the interactive effect of tax avoidance and tax risk on firm value.

Tax Avoidance

Hanlon and Heitzman (2010) define tax avoidance as ''the reduction of explicit taxes'' (p. 137). Prior literature documents context-specific positive investor valuation of tax avoidance. For example, Desai and Dharmapala (2009) find that tax avoidance is positively associated with firm value in the presence of strong corporate governance. Similarly, Wilson (2009) investigates the stock returns of firms engaging in corporate tax shelters and finds that positive returns are concentrated in well governed firms. Inger (2014) examines how the valuation of tax avoidance varies by the source of the avoidance and finds that tax avoidance from stock options is positively associated with firm value but that tax avoidance related to foreign earnings is negatively associated with firm value. Finally, Frank, Lynch, and Rego (2009) find that the market generally prices tax avoidance in a timely manner, except when the firm also exhibits high levels of aggressive financial reporting.

Although the literature discussed above implies positive valuation of tax avoidance in specific contexts, other studies suggest that tax avoidance may negatively influence firm value. For instance, Cook, Moser, and Omer (2015) examine whether the relation between tax avoidance and the cost of capital is contingent upon the deviation from the firm's expected level of tax avoidance. The authors find that the ex ante cost of capital increases with deviations from expected levels of tax avoidance. Other research suggests that unlike other expenses, taxes are monitored by third parties (Hoopes et al., 2012), and tax avoidance can be a potential ''hot button'' issue if investors perceive firms as failing to pay their ''fair share'' (Dyreng et al., 2016). Moreover, unlike the reduction of other expenses, reducing tax expense may bear reputational costs (Citizens for Tax Justice, 2011). Consistent with this notion, Hanlon and Slemrod (2009) find that the market reacts negatively to news about corporate involvement in tax shelters, and that this effect is more pronounced for the retail sector, which is more prone to potential consumer backlash.[5] There may be potential negative consequences to aggressive forms of tax avoidance, including the possibility of future economic outlays in the form of repayment of taxes and related interest and penalties.

To summarize the above discussion, while some studies document negative outcomes associated with certain forms of tax avoidance, the literature generally implies a positive valuation of tax avoidance. However, to the best of our knowledge, this result has not yet been documented in a broad setting. In addition, examining the valuation of tax avoidance provides a baseline for our hypothesis regarding the interactive effect of tax avoidance and tax risk on firm value discussed below. Thus, we predict the following hypothesis:

Hypothesis 1 (H1): Investors positively value tax avoidance.

Tax Risk

Firms can achieve tax avoidance with varying degrees of risk. Consistent with this proposition, Neuman (2016) argues that not all firms pursue tax strategies that focus primarily on tax minimization and suggests that the sustainability of tax strategies is another important component of corporate tax planning. Tax strategies may be unsustainable/risky for a number of reasons. For instance, tax positions claimed in one period may be reversed upon audit in subsequent periods. Similarly, tax benefits may be persistent or may affect only one period. Based on these ideas, recent literature has begun to differentiate tax avoidance from the risk associated with firms' tax strategies. These studies use a number of different conceptual definitions and proxies for tax risk. For example, Hutchens and Rego (2015) define tax risk as, ''all tax-related uncertainties that surround a firm's transactions, operations, financial reporting decisions, and corporate reputation'' (p. 1), and proxy for tax risk using UTBs, current-year additions to UTBs, discretionary permanent book-tax differences (DTAX), and the volatility of cash ETRs. The authors find that, in general, tax risk using the DTAX and volatility of cash ETRs proxies is positively associated with firm risk; however, the UTB proxies for tax risk are not. Alternatively, Neuman, Omer, and Schmidt (2016) contend that tax risk ''arises from the interaction of economic risk and tax law uncertainty'' (p. 1), and define tax risk as, ''the potential that a current action or activity, or the failure to take action or pursue an activity, will lead to future tax outcomes that differ from expectations'' (p. 7). Neuman et al. (2016) proxy for tax risk by creating a tax risk index comprised of transactional, operational, compliance, financial accounting, management, and reputational risk components.[6]

We focus on a view of tax risk that is akin to the traditional view in the finance literature in which risk refers to the dispersion of potential outcomes from an investment, and reflects the degree of uncertainty about the future (Brealey et al., 2011). Under this view of risk, if tax avoidance is viewed as an investment resulting in cash tax savings, then dispersion in those potential cash tax savings is tax risk. Guenther et al. (2017) take a similar view of tax risk as we do (i.e., the dispersion of potential outcomes) and use the standard deviation of annual cash ETRs in their tests of the association between ETRs and future tax rate volatility. This measure of tax risk captures fluctuations in ETRs due to temporary, nonrecurring tax strategies, as well as tax positions claimed in one period but reversed later upon audit by tax authorities. Although not the primary focus of their study, Guenther et al. (2017) show that the standard deviation of annual cash ETRs is associated with future stock return volatility.[7]

Examining the association between risk (such as tax risk) and asset prices, the traditional capital asset pricing model (CAPM) suggests that only systematic (i.e., nondiversifiable) risk should influence asset prices, as firm-specific (i.e., idiosyncratic) risk can be diversified away through appropriate portfolio allocation (Sharpe, 1964). Under this view, tax risk should only influence firm value if at least a portion of tax risk is nondiversifiable. Accordingly, it is important to consider why tax risk may not be diversifiable. Lambert, Leuz, and Verrecchia (2007) demonstrate analytically that the cost of capital depends on (a) the risk-free rate, (b) the aggregate risk tolerance of the market, (c) the expected cash flows of the firm, and (d) the covariance of the firm's cash flows with the sum of all firms' cash flows in the market. The authors also show that the latter three terms can be combined into the ratio of a firm's expected future cash flows to the covariance of the firm's cash flows with the sum of all cash flows in the market. Thus, this ratio is a determinant of a firm's cost of equity capital, implying that tax risk will influence the cost of equity capital to the extent that tax risk influences this ratio. Sikes and Verrecchia (2014) extend the theoretical model in Lambert et al. (2007) by applying a firm-level tax rate, influenced by each firm's choice of tax strategies, on firms' expected cash flows. The conclusion from the authors' model is that when a meaningful portion of firms in the economy engage in tax avoidance and the outcomes of tax strategies are uncertain, the covariance between a firm's cash flows and the market cash flows increases, thereby increasing the firm's cost of equity capital. Important to our examination of tax risk, the authors also conclude that tax risk (i.e., when the outcomes of tax strategies are uncertain) exacerbates this effect.

In addition to the theoretical literature on the diversification of tax risk, prior empirical studies document that firms within the same industry engage in the same types of tax strategies (Kubick, Lynch, Mayberry, & Omer, 2015). Cook et al. (2015) suggest that this may limit diversification, as tax is likely not a first-order determinant of investment decisions and thus it is unlikely that an investor would avoid a particular industry just because of the riskiness of that industry's tax avoidance strategies. In addition, contrary to the traditional CAPM model, recent literature (e.g., Ang, Hodrick, Xing, & Zhang, 2006; Goyal & Santa-Clara, 2003) documents results consistent with the notion that idiosyncratic risk may influence asset pricing. Therefore, even if we do find an association between tax risk and firm value, it is difficult to ascertain whether tax risk is wholly systematic, wholly idiosyncratic, or a combination of the two.

In terms of outcomes associated with tax risk, Saavedra (2017) identifies firms that have made unusually large payments to tax authorities and documents that these firms have higher volatility in their future tax cash flows, higher loan spreads, and more restrictive debt contract terms compared with other firms. Furthermore, McGuire et al. (2013) find

that firms with sustainable (i.e., less volatile) tax strategies have greater earnings persistence than other firms, and that investors are able to infer the sustainability of a firm's tax strategies and use it as a signal to assess the persistence of earnings.[8] Finally, Bratten, Gleason, Larocque, and Mills (2016) observe that volatile ETRs (one component of what the authors term *tax complexity*) impede the ability of analysts to forecast tax expense.

In addition to the unfavorable outcomes associated with tax risk discussed above, the financial reporting literature documents that earnings with low volatility are more persistent in both the long- and short-term (e.g., Dichev & Tang, 2009). Moreover, investors positively value persistent earnings (e.g., Kormendi & Lipe, 1987), implying that volatility is negatively valued. Rountree, Weston, and Allayannis (2008) provide evidence that cash flow volatility is negatively valued by investors; likewise, we expect investors to negatively value volatility in a firm's tax outcomes (i.e., tax risk). Although the relation between volatility and valuation is intuitive, this relation has not been previously documented in a tax setting with the volatility of tax rates. In addition, as before, we believe this hypothesis provides a baseline for the consideration of our main research question regarding the joint effect of tax avoidance and tax risk on firm value. We therefore hypothesize the following:

Hypothesis 2 (H2): Investors negatively value tax risk.

Interaction Between Tax Avoidance and Tax Risk

As noted above, firms may achieve tax avoidance with varying degrees of tax risk. Thus, we next develop our main research question regarding the *interactive* effect of tax avoidance and tax risk on firm value. To illustrate our prediction, consider a firm engaging in a high level of tax avoidance. To the extent that investors positively value tax avoidance, we expect investors to prefer consistent, sustainable tax avoidance. However, to the extent a firm's tax avoidance is volatile (what we term *tax risk*), investors have more difficulty anticipating continued high levels of tax avoidance into the future. Thus, we expect that the positive investor valuation of tax avoidance will diminish as the risk undertaken to achieve the avoidance increases.

This prediction is analogous to a risk-reward trade-off in that the reward from tax avoidance is traded-off against its associated risks. However, unlike the traditional risk-return trade-off suggested in the intertemporal CAPM model (Merton, 1973) in which the conditional mean and the conditional variance of stock returns are positively correlated, tax avoidance and tax risk are not necessarily positively correlated, on average. Consistent with this notion, Guenther et al. (2017) document that tax avoidance is not associated with future volatility of cash tax rates.[9] One possible explanation for this result is that there are a number of ways in which firms can increase tax avoidance without an associated increase in tax risk. It is only after firms exhaust these nonrisky tax avoidance opportunities that we would expect a risk-return trade-off. Therefore, examining the interactive effect of tax avoidance and tax risk allows us to separate increased tax avoidance achieved with greater risk from increased tax avoidance achieved with less risk. In particular, we predict that volatile ETRs suggest uncertain future tax rates, leading to lower investor valuation. In contrast, a low ETR and low tax risk suggests a firm engages in the types of tax avoidance transactions that are sustainable, and we predict investor valuation to reflect expected consistent tax avoidance.

Prior research examines how more or less aggressive forms of tax avoidance affect a firm's cost of external financing. For instance, similar to our tax avoidance hypothesis,

Goh et al. (2016) examine the cost of equity implications of tax avoidance. Using various measures of tax avoidance (book-tax differences, permanent book-tax differences, and cash ETRs), Goh et al. (2016) find that tax avoidance is associated with a lower cost of equity. Although not the primary focus of their study, in untabulated additional analyses the authors use proxies for more aggressive forms of tax planning, in particular predicted UTBs and the likelihood of tax shelter participation (Lisowsky, 2010). When using these alternate proxies, the association with cost of equity is positive (predicted UTBs) or insignificant (tax shelter score). Thus, Goh et al. (2016) do not provide consistent results between their two tests of the association between more aggressive forms of tax planning and the cost of equity capital.

Our study can be distinguished from Goh et al. (2016) along three important dimensions. First, while Goh et al. (2016) provide inconclusive evidence of the effect of more aggressive forms of tax avoidance on the cost of equity capital as part of their untabulated additional analyses, we provide a substantive investigation of the relationship between tax avoidance, tax risk, and firm value. Second, Goh et al. (2016) choose to differentiate the aggressiveness of tax strategies by examining different proxies that capture more or less aggressive forms of tax avoidance (i.e., predicted UTBs and tax shelter score). In addition, they only consider measures of tax avoidance, and not the interaction of tax avoidance and tax risk. We vary from this design choice by examining a measure of tax avoidance (i.e., cash ETRs) that will capture a broad spectrum of explicit tax avoidance, and then we differentiate the riskiness of the strategies by interacting tax avoidance and tax risk to capture the effect that differential levels of tax risk have on the valuation of tax avoidance. Third, Goh et al. (2016) examine the cost of equity capital, which clearly impacts firm value. However, value is a function of expected future cash flows and a discount factor; therefore, we argue that examining the cost of equity in isolation does not provide a complete analysis of the impact of tax avoidance, tax risk, and their interaction on value.[10] As such, we consider whether the valuation of tax avoidance depends on the accompanying level of tax risk. We hypothesize that:

Hypothesis 3 (H3): Tax risk moderates the positive investor valuation of tax avoidance.

A related concurrent working paper, Jacob and Schütt (2015), also examines firm value as a function of both tax avoidance and the volatility of tax avoidance. However, our study differs from theirs in a number of ways. First, their focus is how current tax avoidance affects firm valuation via its influence on the level and perceived uncertainty of expected future tax rates. The authors use analysts' expectations of future tax rates to evaluate how analysts interpret tax avoidance and volatility. Second, Jacob and Schütt (2015) use the stability and level of expected tax rates to create a composite tax planning score (i.e., a tax signal-to-noise ratio) and find that investors value pretax earnings more highly among firms with effective and persistent tax planning than among other firms. We choose to separately examine tax avoidance, tax risk, and their interaction rather than using such a composite score because the construction of the tax planning score yields similar results for firms that exhibit high tax avoidance and high volatility (risk) and those that exhibit low tax avoidance and low volatility (risk), which is not a restriction we choose to impose on our analysis.[11] Third, Jacob and Schütt (2015) examine the effect of their tax planning score on the association between pretax earnings and firm value, which differs from our focus on the direct effect of tax avoidance, tax risk, and their interaction on firm value.

Research Design

Regression Models and Variable Definitions

Our first hypothesis is that investors positively value tax avoidance. To test this prediction, we regress firm value, measured as Tobin's *q*, on tax avoidance, along with a battery of control variables and industry and year fixed effects. We follow prior research examining investor valuation of corporate tax avoidance (e.g., Desai & Dharmapala, 2009; Inger, 2014), and measure our variable *TOBINQ* as the ratio of the market value of assets (calculated as the market value of equity 4 months after fiscal year-end plus total assets minus common equity) to the book value of assets. We measure tax avoidance using the 5-year cash ETR (Dyreng et al., 2008), calculated as the sum of cash taxes paid over the period $t-4$ to t scaled by the sum of pretax book income less special items over the same period.[12] To facilitate the interpretation of our results, we multiply the firm's 5-year cash ETR by negative one (–1) to arrive at our measure *TAXAVOID*, as lower cash ETRs suggest that the firm engages in relatively greater tax avoidance. This yields the following regression model (Model 1):

$$\begin{aligned} TOBINQ = {} & \beta_0 + \beta_1 \times TAXAVOID + \alpha_1 \times PTROA + \alpha_2 \times VOL\_PTROA \\ & + \alpha_3 \times PTROA \times VOL\_PTROA + \alpha_4 \times NOL + \alpha_5 \times LN\_SALES \\ & + \alpha_6 \times LEVERAGE + \alpha_7 \times FOREIGN + \alpha_8 \times CAPEX + \alpha_9 \times SALES\_GROWTH \\ & + \alpha_{10} \times R\&D + \alpha_{11} \times ADVERTISING + \alpha_{12} \times INTANGIBLES + \alpha_{13} \times DEPRECIATION \\ & + \sum \gamma_{1-62} \times Industry\ Fixed\ Effects + \sum \varphi_{1-22} \times Year\ Fixed\ Effects \\ & + \varepsilon. \end{aligned} \tag{1}$$

Based on our first hypothesis that investors positively value tax avoidance, we predict a positive coefficient on *TAXAVOID*, $\beta_1 > 0$.

We control for a number of variables that prior studies have shown to be associated with firm value and tax avoidance. First, to control for the effect of firm performance on firm value, we include in our model measures of the level and volatility of return on assets (pretax return on assets in period t and the standard deviation of annual pretax return on assets over the period $t-4$ to t, respectively). We denote these variables as *PTROA* and *VOL_PTROA*, respectively. Similar to our tax avoidance and tax risk interaction discussed later, we also interact these two variables to control for the joint effect of the level and volatility of firm performance on firm value.

We next control for tax net operating loss carryforwards (calculated as total tax NOLs scaled by total assets and denoted as *NOL* in our tests). We also control for firm size using the natural logarithm of sales (denoted as *LN_SALES* in our tests) as prior studies have shown that larger firms have greater ability and opportunity to engage in tax planning (e.g., Manzon & Plesko, 2002; Rego, 2003).[13] In addition, we control for leverage (calculated as the sum of short-term debt and long-term debt scaled by total assets, denoted by *LEVERAGE*) as prior literature has documented an association between leverage and firm value (e.g., Lang, Ofek, & Stulz, 1996). We next control for foreign income (calculated as pretax foreign income scaled by total pretax income, denoted by *FOREIGN* in our tests), capital expenditures (calculated as capital expenditures scaled by total assets and denoted by *CAPEX*), and 3-year percentage sales growth (denoted by *SALES_GROWTH* in our

tests), all of which may capture some aspect of a firm's growth opportunities. Likewise, intangible assets may be associated with growth opportunities; therefore, we include four proxies for intangible assets from Barth, Kasznik, and McNichols (2001): *R&D* (calculated as R&D expense scaled by pretax income), *ADVERTISING* (calculated as advertising expense scaled by pretax income), *INTANGIBLES* (calculated as intangible assets recorded on the balance sheet scaled by total assets), and *DEPRECIATION* (calculated as depreciation expense scaled by pretax income).[14]

Our second hypothesis is that investors negatively value tax risk. To test this prediction, we regress *TOBINQ* on *TAXRISK*, which we measure as the firm's standard deviation of annual cash ETRs over the period $t-4$ to t, where a greater standard deviation suggests greater tax risk. We also include the same control variables as in Model 1 above. This yields the following regression model (Model 2):

$$\begin{aligned} TOBINQ = {} & \beta_0 + \beta_1 \times TAXRISK + \alpha_1 \times PTROA + \times \alpha_2 VOL\_PTROA \\ & + \alpha_3 \times PTROA \times VOL\_PTROA + \alpha_4 \times NOL + \alpha_5 \times LN\_SALES \\ & + \alpha_6 \times LEVERAGE + \alpha_7 \times FOREIGN + \alpha_8 \times CAPEX \\ & + \alpha_9 \times SALES\_GROWTH + \alpha_{10} \times R\&D + \alpha_{11} \times ADVERTISING \\ & + \alpha_{12} \times INTANGIBLES + \alpha_{13} \times DEPRECIATION \\ & + \sum \gamma_{1-62} \times Industry\ Fixed\ Effects + \sum \varphi_{1-22} \times Year\ Fixed\ Effects \\ & + \varepsilon. \end{aligned} \tag{2}$$

All variables are as defined above. Based on our second hypothesis that investors negatively value tax risk, we predict a negative coefficient on *TAXRISK*, $\beta_1 < 0$.

Finally, to test our third and main hypothesis regarding the joint effect of tax avoidance and tax risk on firm value, we construct the following regression model (Model 3):

$$\begin{aligned} TOBINQ = {} & \beta_0 + \beta_1 \times TAXAVOID + \beta_2 \times TAXRISK + \beta_3 \times TAXAVOID \times TAXRISK \\ & + \alpha_1 \times PTROA + \alpha_2 \times VOL\_PTROA + \alpha_3 \times PTROA \times VOL\_PTROA \\ & + \alpha_4 \times TAXAVOID \times VOL\_PTROA + \alpha_5 \times NOL + \alpha_6 * LN\_SALES \\ & + \alpha_7 \times LEVERAGE + \alpha_8 \times FOREIGN + \alpha_9 \times CAPEX \\ & + \alpha_{10} \times SALES\_GROWTH + \alpha_{11} \times R\&D + \alpha_{12} \times ADVERTISING \\ & + \alpha_{13} \times INTANGIBLES + \alpha_{14} \times DEPRECIATION \\ & + \sum \gamma_{1-62} \times Industry\ Fixed\ Effects + \sum \varphi_{1-22} \times Year\ Fixed\ Effects \\ & + \varepsilon. \end{aligned} \tag{3}$$

Note that for this model, we also include the interaction of *TAXAVOID* and *VOL_PTROA* to control for the concern that our proxy for tax risk merely captures operational risk. All variables are as defined above. Our third hypothesis is that tax risk moderates the positive association between tax avoidance and firm value. Consequently, we predict a positive coefficient on *TAXAVOID*, $\beta_1 > 0$, and a negative coefficient on the interaction *TAXAVOID* × *TAXRISK*, $\beta_3 < 0$.

Sample Selection

Our sample selection begins with 108,519 U.S.-domiciled, nonfinancial and nonutility firm-year observations drawn from Compustat over the years 1992 to 2014. Following prior research, we exclude utility (SIC codes 4900-4999) and financial (SIC codes 6000-6999) firms because these firms operate in regulated industries and therefore likely face different reporting and tax incentives than do other firms in our sample. We begin our sample in 1992 because our 5-year cash ETR measure requires 4 years of lagged cash taxes paid, and this variable became available beginning in 1988.

From this initial sample, we first delete 33,353 observations missing data required to calculate our variables of interest: Tobin's q, 5-year cash ETR, and 5-year standard deviation of annual cash ETRs. We then delete another 2,192 observations missing data necessary to calculate at least one control variable.[15] Next, we delete 20,343 observations with a negative numerator or denominator in the 5-year cash ETR calculation because negative ETRs are not interpretable (Hanlon, Mills, & Slemrod, 2005). We then delete 8,965 observations with negative pretax income in the current year because of differing tax incentives facing profitable and loss firms and because of prior research suggesting that investors differentially value profitable firms and loss firms (e.g., Hayn, 1995).[16] Finally, we delete 3,309 observations with 5-year cash ETRs or standard deviation of annual cash ETRs greater than 100%.[17] This sample selection procedure, which we summarize in Panel A of Table 1, yields a final sample of 40,357 firm-year observations available for our primary tests. Panels B and C of Table 1 provide breakdowns of our final sample by year and industry, respectively.

Descriptive Statistics and Correlations

Table 2 reports descriptive statistics for our sample. Mean (median) Tobin's q is 1.90 (1.54). The mean (median) firm in our sample has a 5-year cash ETR (i.e., $TAXAVOID \times -1$) of approximately 26.7% (27.3%) and a mean (median) standard deviation of annual cash ETRs (*TAXRISK*) of approximately 16.4% (10.5%).

Table 3 presents Pearson correlations among the variables used in our primary tests. Consistent with our predictions that investors positively value tax avoidance but negatively value tax risk, we find correlations of 0.08 ($p < .01$) and –0.15 ($p < .01$) between *TOBINQ* and *TAXAVOID* and *TAXRISK*, respectively. Notably, we also find that *TAXAVOID* and *TAXRISK* are significantly *negatively* correlated at –0.27 ($p < .01$), suggesting that these constructs capture different dimensions of corporate tax outcomes. We explore these relations in greater detail in our multivariate tests below.

Results

Primary Results

In Table 4, we present the results of estimating Models 1, 2, and 3. As predicted in H1, in the first column, the coefficient on *TAXAVOID* is significantly positive ($p < .01$), indicating that tax avoidance is positively associated with firm value. The signs of the coefficients on control variables are generally consistent across models and consistent with prior literature.[18] In the second column, we present the results of estimating Model 2. As predicted in H2, the coefficient on *TAXRISK* is significantly negative ($p < .01$), suggesting that

Table 1. Sample Selection and Composition.

Panel A: Sample Selection.

Restriction	Observations
Nonfinancial/nonutility, U.S.-domiciled firm-years, 1992-2014	108,519
Less: Missing data to calculate Tobin's *q*, tax avoidance, or tax risk variables	(33,353)
Less: Missing control variables	(2,192)
Less: Negative numerator or denominator in 5-year cash ETR calculation	(20,343)
Less: Negative pretax income in current year	(8,965)
Less: Five-year cash ETR or standard deviation of annual cash ETRs greater than 100%	(3,309)
Final Sample for Primary Tests	40,357

Note. This table presents the sample selection procedure followed in this study. All variables are as defined in the Appendix. ETR = effective tax rate.

Panel B: Sample Composition by Year.

Year	*n*	Percent of full sample
1992	1,517	3.76
1993	1,722	4.27
1994	1,896	4.70
1995	1,918	4.75
1996	2,112	5.23
1997	2,144	5.31
1998	2,047	5.07
1999	2,096	5.19
2000	1,947	4.82
2001	1,579	3.91
2002	1,651	4.09
2003	1,697	4.21
2004	1,790	4.44
2005	1,777	4.40
2006	1,793	4.44
2007	1,769	4.38
2008	1,516	3.76
2009	1,489	3.69
2010	1,700	4.21
2011	1,660	4.11
2012	1,635	4.05
2013	1,556	3.86
2014	1,346	3.34
Total	40,357	100.00

Note. This table presents the composition of our full sample by year.

Panel C: Sample Composition by Industry.

Industry	*n*	Percent of full sample
0. Agriculture, Forestry, and Fishing	202	0.50
1. Mining and Construction	2,396	5.94
2. Manufacturing—Light Products	7,711	19.11
3. Manufacturing—Heavy Products	14,162	35.09
4. Transportation	2,564	6.35
5. Wholesale and Retail Trade	6,060	15.02
7. Services—Entertainment, Personal, etc.	5,102	12.64
8. Services—Health, Legal, etc.	2,068	5.12
9. Public Administration and Nonclassifiable	92	0.23
Total	40,357	100.00

Note. This table presents the composition of our full sample by industry (one-digit SIC code).

Table 2. Descriptive Statistics.

Variable	*n*	*M*	*Mdn*	*SD*	P25	P75
TOBINQ	40,357	1.897	1.536	1.222	1.149	2.205
TAXAVOID	40,357	–0.267	–0.273	0.139	–0.350	–0.175
TAXRISK	40,357	0.164	0.105	0.173	0.058	0.196
PTROA	40,357	0.108	0.092	0.075	0.054	0.145
VOL_PTROA	40,357	0.054	0.038	0.050	0.022	0.067
NOL	40,357	0.715	0.000	2.633	0.000	0.116
LN_SALES	40,357	6.423	6.373	1.908	5.066	7.691
LEVERAGE	40,357	0.202	0.183	0.175	0.036	0.316
FOREIGN	40,357	0.207	0.000	0.387	0.000	0.270
CAPEX	40,357	1.085	0.485	2.022	0.234	1.034
SALES_GROWTH	40,357	0.169	0.169	0.236	0.048	0.307
R&D	40,357	0.371	0.000	0.958	0.000	0.317
ADVERTISING	40,357	0.168	0.000	0.482	0.000	0.087
INTANGIBLES	40,357	0.141	0.067	0.174	0.000	0.223
DEPRECIATION	40,357	0.862	0.417	1.552	0.228	0.804

Note. This table presents descriptive statistics for the variables used in this study. All variables are as defined in the Appendix. All continuous variables are winsorized at the 1% and 99% levels except *TAXAVOID* and *TAXRISK* are truncated at values of –1 and 1, respectively.

Table 3. Correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	13	15
1. *TOBINQ*	—														
2. *TAXAVOID*	**.08**	—													
3. *TAXRISK*	**–.15**	**–.27**	—												
4. *PTROA*	**.58**	**–.05**	**–.21**	—											
5. *VOL_PTROA*	**.16**	**.03**	**.18**	**.20**	—										
6. *NOL*	**–.07**	**.12**	**.07**	**–.22**	**.10**	—									
7. *LN_SALES*	–.01	.01	**–.15**	**–.04**	**–.25**	**–.04**	—								
8. *LEVERAGE*	**–.23**	**.08**	**.02**	**–.34**	**–.13**	**.06**	**.22**	—							
9. *FOREIGN*	**–.02**	**.03**	**.06**	**–.17**	.00	**.22**	**.21**	**.01**	—						
10. *CAPEX*	**–.17**	**.07**	**.12**	**–.37**	**–.02**	**.24**	**–.03**	**.21**	**.14**	—					
11. *SALES_GROWTH*	**.21**	**.11**	**–.07**	**.21**	**.04**	**–.07**	**–.04**	**–.01**	**–.09**	**–.05**	—				
12. *R&D*	**.02**	**.05**	**.12**	**–.23**	**.12**	**.28**	**–.10**	**–.13**	**.32**	**.23**	**–.05**	—			
13. *ADVERTISING*	**–.06**	**–.06**	**.08**	**–.15**	.00	**.10**	**.04**	**.05**	**.06**	**.17**	**–.07**	**.10**	—		
14. *INTANGIBLES*	**–.04**	**.015**	**–.07**	**–.13**	**–.08**	**.08**	**.20**	**.20**	**.11**	**–.12**	**.04**	**.01**	**.01**	—	
15. *DEPRECIATION*	**–.19**	**.02**	**.19**	**–.43**	.00	**.33**	**–.03**	**.19**	**.22**	**.82**	**–.12**	**.34**	**.23**	**–.01**	—

Note. This table presents Pearson correlations among the variables used in this study. All variable definitions are provided in the Appendix. All continuous variables are winsorized at the 1% and 99% levels except *TAXAVOID* and *TAXRISK* are truncated at values of –1 and 1, respectively. Correlations in **bold** are statistically significant at the 10% level or lower.

investors negatively value tax risk. These results complement Guenther et al. (2017), who show that the standard deviation of cash ETRs is associated with future stock return volatility.

We test our third and main hypothesis regarding the moderating effect of tax risk on the valuation of tax avoidance using Model 3 and present the results of this analysis in the

Table 4. Investor Valuation of Tax Avoidance and Tax Risk.

DV = *TOBINQ* Variable	Model 1 Coefficient *t*-stat	Model 2 Coefficient *t*-stat	Model 3 Coefficient *t*-stat
INTERCEPT	0.369***	0.247*	0.463***
	2.84	*1.77*	*3.66*
TAXAVOID	0.799***	—	1.198***
	12.42		*10.59*
TAXRISK	—	–0.218***	–0.405***
		–5.92	*–5.37*
TAXAVOID × *TAXRISK*	—	—	–1.235***
			–5.69
PTROA	10.879***	10.627***	10.937***
	34.72	*33.54*	*34.44*
VOL_PTROA	2.668***	2.696***	2.225***
	9.08	*9.12*	*5.87*
PTROA × *VOL_PTROA*	–15.676***	–14.599***	–15.911***
	–5.91	*–5.48*	*–5.98*
TAXAVOID × *VOL_PTROA*	—	—	–1.771*
			–1.68
NOL	0.003	0.007***	0.003
	1.30	*2.72*	*1.07*
LN_SALES	0.039***	0.036***	0.040***
	5.95	*5.32*	*6.04*
LEVERAGE	0.042	0.093	0.027
	0.71	*1.57*	*0.46*
FOREIGN	0.096***	0.087***	0.095***
	4.28	*3.83*	*4.24*
CAPEX	0.018***	0.022***	0.017***
	3.67	*4.70*	*3.46*
SALES_GROWTH	0.480***	0.532***	0.474***
	13.20	*14.14*	*13.07*
R&D	0.131***	0.135***	0.131***
	13.50	*13.73*	*13.54*
ADVERTISING	0.014	0.010	0.014
	0.90	*0.63*	*0.93*
INTANGIBLES	–0.150***	–0.179***	–0.148**
	–2.59	*–3.05*	*–2.56*
DEPRECIATION	0.011*	0.005	0.013*
	1.71	*0.71*	*1.91*
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
SE clustered by firm	Yes	Yes	Yes
Observations	40,357	40,357	40,357
Adjusted R^2	43.74%	43.11%	43.84%

Note. This table presents results of estimating OLS regression Models 1, 2, and 3. The italicized values are *t*-statistics. *TOBINQ* is measured as the ratio of the market value of assets to the book value of assets. *TAXAVOID* is the firm's 5-year cash ETR multiplied by negative one (–1). *TAXRISK* is the firm's 5-year standard deviation of annual cash ETRs. All other variable definitions are provided in the Appendix. All continuous variables are winsorized at the 1% and 99% levels except *TAXAVOID* and *TAXRISK* are truncated at values of –1 and 1, respectively. DV = dependent variable; OLS = ordinary least squares; ETR = effective tax rate.

*, **, and *** denote statistical significance (two-tailed) at the 10%, 5%, and 1% levels, respectively.

third column of Table 4. In the interacted model, we find that the coefficient on the *TAXAVOID* main effect is significantly positive while the coefficient on the *TAXAVOID* × *TAXRISK* interaction is significantly negative (both $p < .01$). These findings provide support for our hypothesis that tax risk moderates the positive valuation of tax avoidance.[19] Thus, our results suggest that investors appear to differentiate between tax avoidance that is less volatile, and thus more indicative of future tax avoidance, and tax avoidance that is more volatile (i.e., risky) and thus presents investors with more difficulty in forecasting future levels of tax avoidance. In addition, these results demonstrate the importance of simultaneously considering the joint effect of tax avoidance and tax risk, rather than examining each construct in isolation.

The magnitude of the coefficients from Model 3 in Table 4 suggests that our mean firm (i.e., a firm at the mean of our sample on all regression variables) has a predicted Tobin's q of 1.79. All else equal, our results indicate that if our mean firm were to increase its tax avoidance by one standard deviation (which would approximately equate to moving from the U.S. statutory tax rate of 35% to a tax rate of 21%) then the firm's expected Tobin's q would be 1.91, representing a predicted increase in firm value of 6.70%. However, if the one standard deviation increase in tax avoidance were combined with a one standard deviation increase in tax risk, we find that the increase in Tobin's q would only be 4.47%.[20] Therefore, our results suggest that the increase in firm value from a one standard deviation increase in tax avoidance is 33.28% smaller if the increase in tax avoidance is coupled with a corresponding increase in tax risk. We also note that our results suggest that a one standard deviation increase in tax avoidance would need to be coupled with an approximately 2.5 standard deviation increase in tax risk to fully offset the positive valuation of avoidance.

Additional Analyses

Persistence of Tax Avoidance and Tax Risk

An implication of our primary tests is that investors can form expectations of a firm's future tax cash flows using contemporaneous measures of the firm's tax avoidance and tax risk and that, to the extent a firm's tax avoidance is volatile (what we term *tax risk*), investors have more difficulty anticipating continued high levels of tax avoidance into the future. We examine this implication in our first set of additional analyses, in which we test the associations between current tax avoidance and tax risk and future tax avoidance and tax risk. Specifically, we define a new variable, *FUTURE_TAXAVOID*, as the firm's 5-year cash ETR over the period $t + 1$ to period $t + 5$, multiplied by negative one. Similarly, we construct a new variable, *FUTURE_TAXRISK*, as the standard deviation of the firm's annual cash ETRs over the period $t + 1$ to $t + 5$. We then regress these measures of future tax avoidance and tax risk on the measures of current tax avoidance and tax risk (calculated over the period $t - 4$ to t) used in our primary tests. We also interact our measures of tax avoidance and tax risk to examine whether tax risk affects the association between current and future tax avoidance.

We report the results of these tests in Table 5. In the first two columns, we find positive and highly significant coefficients on both *TAXAVOID* and *TAXRISK* (both $p < .01$), indicating that current tax avoidance and tax risk are significant predictors of future tax avoidance and tax risk. While we note the R^2 in the tax risk persistence test (column 2) is relatively low, our main interest is in the interactive effect of *TAXAVOID* and *TAXRISK* on

Table 5. Predictive Ability of Tax Avoidance and Tax Risk for Future Tax Avoidance and Tax Risk.

Variable	DV = *FUTURE_TAXAVOID* Coefficient *t*-stat	DV = *FUTURE_TAXRISK* Coefficient *t*-stat	DV = *FUTURE_TAXAVOID* Coefficient *t*-stat
INTERCEPT	–0.118**	0.137***	–0.083***
	–21.82	*40.20*	*–14.17*
TAXAVOID	0.483***	—	0.648***
	26.32		*33.10*
TAXRISK	—	0.210***	–0.189***
		11.57	*–4.97*
TAXAVOID × *TAXRISK*	—	—	–0.913***
			–8.38
Year Fixed Effects	No	No	No
Industry Fixed Effects	No	No	No
SE Clustered by Firm	Yes	Yes	Yes
Observations	17,660	17,660	17,660
Adjusted R^2	10.14%	2.50%	12.07%

Note. This table presents results of estimating OLS regressions to test the association between current and future measures of tax avoidance and tax risk. The italicized values are *t*-statistics. *TAXAVOID* is the firm's 5-year cash ETR multiplied by negative one (–1) measured over the period $t - 4$ to t, and *FUTURE_TAXAVOID* is measured over the period $t + 1$ to $t + 5$. *TAXRISK* is the firm's 5-year standard deviation of annual cash ETRs measured over the period $t - 4$ to t, and *FUTURE_TAXRISK* is measured over the period $t + 1$ to $t + 5$. All other variable definitions are provided in the Appendix. All continuous variables are winsorized at the 1% and 99% levels except *TAXAVOID* and *FUTURE_TAXAVOID* are truncated at values of –1, and *TAXRISK* and *FUTURE_TAXRISK* are truncated at values of 1. DV = dependent variable; OLS = ordinary least squares; ETR = effective tax rate.
*, **, and *** denote statistical significance (two-tailed) at the 10%, 5%, and 1% levels, respectively.

FUTURE_TAXAVOID. In the third column, we find that tax risk significantly moderates the positive association between current and future tax avoidance ($p < .01$). Consistent with our results documenting persistence in the volatility of ETRs (i.e., tax risk), concurrent research suggests that the volatility of tax rates is a significant determinant of both the accuracy and dispersion of analyst forecasts of tax expense and thus after-tax earnings per share (Bratten et al., 2016). Therefore, it appears the current five-year cash ETR and the volatility of annual cash ETRs provide information that investors may use to form expectations about future cash ETRs (tax avoidance) and cash ETR volatility (tax risk). In turn, this influences expectations of the firm's future tax cash flows. Overall, we believe the results of these tests provide insight into one mechanism that could lead investors to discount the expected future cash flows associated with tax avoidance when it is coupled with tax risk.[21]

GAAP ETR Measures of Tax Avoidance and Tax Risk

Although much of the recent literature on tax avoidance and tax risk focuses on cash ETRs, in our next tests, we also examine investor valuation of GAAP ETR-based measures of tax avoidance and tax risk. Cash ETRs are more in line with the spirit of the definition of tax avoidance as the ''reduction of explicit taxes'' (Hanlon & Heitzman, 2010), and

GAAP tax avoidance only captures permanent differences between tax and financial reporting. However, recent survey evidence suggests that managers use the GAAP ETR as a performance metric and evaluate proposed tax strategies by their effect on GAAP earnings (Graham et al., 2014). Thus, in our next additional analysis, we reestimate our tests of H1, H2, and H3 using GAAP ETRs.

In Table 6, we report the results of estimating Models 1, 2, and 3 using GAAP ETR-based measures of tax avoidance and tax risk (denoted by *GTAXAVOID* and *GTAXRISK*) rather than cash ETR-based measures.[22] Consistent with our primary findings for H1 and H2, we find that *GTAXAVOID* is positively associated with firm value ($p < .01$) and that *GTAXRISK* is negatively associated with firm value ($p < .05$) in Models 1 and 2, respectively. Likewise, in Model 3 using *GTAXAVOID* and *GTAXRISK*, we find a significantly positive coefficient on the main effect of *GTAXAVOID* ($p < .01$) and a significantly negative coefficient on the interaction *GTAXAVOID* × *GTAXRISK* ($p < .05$). Thus, as with the cash ETR measures, we find that investors positively value tax avoidance measured using GAAP ETRs, and that tax risk, measured using the volatility of GAAP ETRs, significantly moderates this positive valuation.

Investor Valuation of Tax Avoidance and Tax Risk Post-FIN 48

We next consider the effect of FIN 48, *Accounting for Uncertainty in Income Taxes*, on investor valuation of tax avoidance, tax risk, and their interaction. FIN 48 (effective for fiscal years beginning after December 15, 2006) requires firms to estimate, record, and disclose a contingent liability for UTBs in their financial statements, providing investors with additional information regarding firms' tax positions that was generally not available in the pre-FIN 48 period (Gleason & Mills, 2002).[23] Koester (2012) documents that investors positively price UTBs, suggesting that while the firm may have to return a portion of the cash tax savings to the taxing authority as a result of an audit, on average, the expected net effect of tax strategies for which UTBs are recorded is a positive cash inflow. We posit that investors may potentially view UTBs as a measure of corporate tax outcomes incremental to—or possibly as a substitute for—our measures of tax avoidance and tax risk.[24]

In untabulated results (included in the Online Appendix), we examine the effect of disclosed UTBs on investor valuation of tax avoidance and tax risk by reestimating our regressions including *UTB*, calculated as the firm's total UTB balance scaled by total assets.[25] Consistent with our main results, when controlling for *UTB*, we continue to find a significantly positive coefficient on *TAXAVOID*, a significantly negative coefficient on *TAXRISK*, and a significantly negative coefficient on the interaction between *TAXAVOID* and *TAXRISK*. In addition, we note that the coefficient on *UTB* is significantly positive, consistent with Koester (2012). These results suggest that investors do not view the information provided in *TAXAVOID, TAXRISK*, and *UTB* as complete substitutes because each measure is incrementally associated with firm value.

We further examine the effect of disclosed UTBs on investor valuation of tax avoidance and tax risk by reestimating our regressions including interactions between *UTB* and our variables of interest (*TAXAVOID* and *TAXRISK*). In untabulated results (included in the Online Appendix), we find that our main results continue to hold while the coefficients on the interactions *UTB* × *TAXAVOID* and *UTB* × *TAXRISK* are both statistically insignificant. These results suggest that UTBs, while informative to investors, do not appear to meaningfully influence investor valuation of cash ETR-based measures of tax avoidance or tax risk as documented in our primary tests.

Table 6. Investor Valuation of Tax Avoidance and Tax Risk: GAAP ETR Measures.

DV = *TOBINQ* Variable	Model 1 Coefficient *t*-stat	Model 2 Coefficient *t*-stat	Model 3 Coefficient *t*-stat
INTERCEPT	0.227	0.114	0.340**
	1.55	*0.76*	*2.42*
GTAXAVOID	0.515***	—	0.804***
	5.26		5.00
GTAXRISK	—	–0.120**	–0.399***
		–2.56	*–3.61*
GTAXAVOID × *GTAXRISK*	—	—	–0.835**
			–2.57
PTROA	11.247***	11.088***	11.092***
	32.93	*32.41*	*32.88*
VOL_PTROA	3.109***	3.303***	2.443***
	7.69	*8.05*	*4.57*
PTROA × *VOL_PTROA*	–17.383***	–17.069***	–15.896***
	–5.26	*–5.14*	*–5.12*
GTAXAVOID × *VOL_PTROA*	—	—	–1.599
			–0.99
NOL	0.009**	0.011***	0.009**
	2.10	*2.67*	*2.10*
LN_SALES	0.042***	0.041***	0.040***
	5.83	*5.66*	*5.74*
LEVERAGE	0.092	0.101	0.090
	1.45	*1.60*	*1.46*
FOREIGN	0.093***	0.110***	0.085***
	3.50	*4.13*	*3.32*
CAPEX	0.026***	0.026***	0.025***
	4.54	*4.63*	*4.53*
SALES_GROWTH	0.537***	0.546***	0.533***
	13.23	*13.41*	*13.36*
R&D	0.157***	0.161***	0.156***
	12.54	*12.79*	*13.01*
ADVERTISING	0.007	0.004	0.006
	0.37	*0.23*	*0.36*
INTANGIBLES	–0.129**	–0.148**	–0.137**
	–2.10	*–2.40*	*–2.26*
DEPRECIATION	0.012	0.011	0.012
	1.41	*1.26*	*1.45*
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
SE Clustered by Firm	Yes	Yes	Yes
Observations	36,959	36,959	36,959
Adjusted R^2	44.43%	44.29%	44.51%

Note. This table presents results of estimating OLS regression Models 1, 2, and 3 using GAAP ETR measures rather than cash ETR measures of tax avoidance and tax risk. *TOBINQ* is measured as the ratio of the market value of assets to the book value of assets. *GTAXAVOID* is the firm's 5-year GAAP ETR multiplied by negative one (–1). *GTAXRISK* is the firm's 5-year standard deviation of annual GAAP ETRs. All other variable definitions are provided in the Appendix. All continuous variables are winsorized at the 1% and 99% levels except *GTAXAVOID* and *GTAXRISK* are truncated at values of –1 and 1, respectively. DV = dependent variable; OLS = ordinary least squares; ETR = effective tax rate.

*, **, and *** denote statistical significance (two-tailed) at the 10%, 5%, and 1% levels, respectively.

Controlling for Idiosyncratic and Systematic Risk

Guenther et al. (2017) state that, ''tax risk may be either systematic or idiosyncratic'' (p. 5). Although it is possible that tax risk is idiosyncratic risk and therefore diversifiable and not reflected in prices, recent finance literature argues that idiosyncratic risk is reflected in equity prices (e.g., Goyal & Santa-Clara, 2003). Bali, Cakici, Yan, and Zhang (2005) suggest the findings in Goyal and Santa-Clara (2003) are driven by small stocks. Therefore, in untabulated robustness tests, we alternatively delete observations with total assets less than US$100 million or pretax income less than US$1 million, and find results that are qualitatively similar to those of our primary tests.

In addition, in untabulated robustness tests (included in the Online Appendix), similar to Rountree et al. (2008), we include controls for systematic and idiosyncratic risk (market beta using value-weighted daily market returns and annualized standard deviation of the residuals from regressing stock returns on contemporaneous value-weighted market returns, respectively). All inferences from our tests remain unchanged. However, given the significant sample attrition associated with requiring these control variables, we omit them from our primary analyses.

Controlling for Cost of Equity Capital

As we discuss above, Goh et al. (2016) examine the effect of tax avoidance on a firm's cost of equity capital. Although firm value is a function of both expected future cash flows and a discount factor, we distinguish our results from Goh et al. (2016) by including a control for a firm's cost of equity capital. Consistent with prior literature, we use the average of four cost of equity capital proxies. The four measures come from Ohlson and Juettner-Nauroth (2005), Easton (2004), Claus and Thomas (2001), and Gebhardt, Lee, and Swaminathan (2001). In untabulated robustness tests (included in the Online Appendix), we find that all inferences from our primary tests remain unchanged. However, given the significant sample attrition associated with requiring this control variable, we omit it from our primary analyses.

Other Robustness Tests

We note that our inferences are also robust to the following changes in research design: first, since the opportunity set to engage in tax avoidance varies across industries and time, we industry-year adjust our measures of *TAXAVOID* and *TAXRISK*. Second, to provide alternative controls of firm performance, we include controls for cash flows from operations, its volatility, and the interaction between its level and volatility. Third, to ensure our results are not driven by our choice of the denominator of cash ETR rather than the numerator, we scale cash taxes paid by cash flows from operations rather than pretax income. Fourth, we include the percentage of institutional ownership in our models to control for differences in corporate governance. Fifth, we use the natural logarithm of the market value of equity as our dependent variable rather than Tobin's q. Sixth, we include a control for tax haven usage (Dyreng & Lindsey, 2009). Finally, we include firm fixed effects and omit industry fixed effects to capture unobserved firm-specific differences in valuation associated with differences in firm-level tax avoidance and tax risk.

Conclusion

In this study, we examine how investors value corporate tax avoidance and tax risk, and how these constructs interact to influence firm value. While we find that investors positively value tax avoidance and negatively value tax risk, we believe that our primary finding and contribution to the literature is that tax risk moderates the positive association between tax avoidance and firm value. That is, our results suggest that investor valuation of tax avoidance is higher when the tax avoidance is less risky. Our results are robust to using GAAP ETR-based measures of tax avoidance and tax risk, and a battery of alternative specifications including controlling for idiosyncratic and systematic risk and the cost of equity capital. We also find that contemporaneous measures of tax avoidance and tax risk provide insight into firms' future tax cash flows. Finally, we find that in the post-FIN 48 period, UTB disclosures supplement information about tax avoidance and tax risk measured using cash ETRs, but the moderating effect of tax risk on investor valuation of tax avoidance continues to hold.

As with any empirical study, our findings are subject to a number of caveats. Most notably, the tax risk literature is still emerging and researchers have not yet reached a consensus on commonly accepted conceptual and/or operational definitions of tax risk. Although we focus on a notion of tax risk related to the dispersion of potential outcomes from tax avoidance, we note that others have taken a more holistic view of tax risk. As such, our conceptualization and operationalization of tax risk may only capture one dimension of a multifaceted construct. Although we would expect that other notions of tax risk are also negatively valued, these alternative operationalizations are outside the scope of this study.

The findings reported in this study make a number of contributions. First, we contribute to the valuation literature and the emerging literature on the consequences of tax risk by identifying that tax risk is an important determinant of investor valuation of corporate tax avoidance. Moreover, our examination of future ETRs provides insight into one mechanism that could lead investors to discount the expected future cash flows associated with tax avoidance when it is coupled with tax risk. Finally, our study demonstrates the importance of separately measuring tax avoidance and tax risk, and considering the effects of tax avoidance and tax risk jointly rather than in isolation.

Appendix Variable Definitions.

Variable	Definition (Compustat or CRSP mnemonics in parentheses)
Primary variables of interest	
TOBINQ	Tobin's *q*, calculated as the ratio of the market value of assets to the book value of assets (AT). Market value of assets is defined as market value of equity (CRSP PRC × SHROUT) measured on the first trading day following four months after the end of the fiscal year, plus total assets (AT), minus common equity (CEQ).
TAXAVOID	Five-year cash effective tax rate multiplied by negative one (–1) to facilitate the interpretation of our results. Five-year cash ETR is calculated as total cash tax expense (TXPD) over the period *t* – *4* to *t* scaled by total PI less special items (SPI) over the same period.
TAXRISK	Five-year (period *t* – *4* to *t*) standard deviation of annual cash effective tax rates (TXPD / (PI – SPI)).
FUTURE_TAXAVOID	Future 5-year cash effective tax rate multiplied by negative one (–1) to facilitate the interpretation of our results. Future 5-year cash ETR is calculated as total cash tax expense (TXPD) over the period *t* + 1 to *t* + 5 scaled by total PI less special items (SPI) over the same period.
FUTURE_TAXRISK	Future 5-year (period *t* + 1 to *t* + 5) standard deviation of annual cash effective tax rates (TXPD / (PI - SPI)).
GTAXAVOID	Five-year GAAP effective tax rate multiplied by negative one (–1) to facilitate the interpretation of our results. Five-year GAAP ETR is calculated as total tax expense (TXT) over the period *t* – 4 to *t* scaled by total PI over the same period.
GTAXRISK	Five-year (period *t* – 4 to *t*) standard deviation of annual GAAP effective tax rates (TXT / PI).
Control variables	
PTROA	Pretax return on assets, calculated as PI scaled by total assets (AT).
VOL_PTROA	Five-year (period *t* – 4 to *t*) standard deviation of annual pretax return on assets (PI / AT).
NOL	Tax net operating loss carryforwards (TLCF) scaled by total assets (AT). We set this variable equal to zero if missing.
LN_SALES	Natural logarithm of total sales (SALE).
LEVERAGE	Sum of long- and short-term debt (DLTT and DLC) scaled by total assets (AT).
FOREIGN	Pretax foreign income (PIFO) scaled by total PI. We set this variable equal to zero if missing.
CAPEX	Capital expenditures (CAPX) scaled by PI.
SALES_GROWTH	Percentage growth in sales (SALE) over the prior 3 years.
R&D	R&D expense (XRD) scaled by PI. We set this variable equal to zero if missing.
ADVERTISING	Advertising expense (XAD) scaled by PI. We set this variable equal to zero if missing.
INTANGIBLES	Intangible assets (INTAN) scaled by total assets (AT). We set this variable equal to zero if missing.
DEPRECIATION	Depreciation expense (DP) scaled by PI.

Note. PI = pretax income.

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Supplemental Material

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Notes

1. Hanlon and Heitzman (2010) define tax avoidance as ''the reduction of explicit taxes,'' and characterize tax avoidance as a spectrum, with tax evasion or noncompliance at the most aggressive end of the continuum and tax planning at the least aggressive. In this study, we focus on tax avoidance without inferring aggressiveness, and use tax risk as a means to differentiate the nature of the tax avoidance.
2. Hutchens and Rego (2015) examine a number of potential proxies for tax risk and find that volatility of cash effective tax rates (ETRs) and discretionary permanent book-tax differences (DTAX) are associated with firm risk, while the reserve for unrecognized tax benefits (UTBs) and current-year additions to the UTB liability are not.
3. We obtain these figures by calculating predicted values based on the coefficients from Model 3 presented in Table 4 and the descriptive data presented in Table 2.
4. The main research question in Guenther, Matsunaga, and Williams (2017) focuses on whether tax avoidance is associated with various measures of firm risk. In an additional analysis, they document that the volatility of cash ETRs is associated with future stock return volatility, which suggests that tax rate volatility and firm risk are related.
5. In untabulated analyses (included in the Online Appendix), we separately estimate our models on sub-samples of retail (SIC codes 5200-5989) and nonretail firms. Consistent with Hanlon and Slemrod (2009), we find that among retail firms, tax risk has a significantly larger ($p < .10$) moderating effect on the positive valuation of tax avoidance than it does among nonretail firms.
6. Another recent study by De Simone, Mills, and Stomberg (2016) uses IRS audit data to consider a narrow definition of tax risk: negative IRS audit outcomes. Although potential cash outflows to tax authorities impact tax risk, for our research question, we prefer to use a broader measure of tax risk.
7. We seek to capture volatility in a firm's tax rates that is *unrelated* to volatility in the firm's performance. Therefore, in our empirical tests we control for volatility of return on assets to isolate the effect that nonperformance-related tax rate volatility has on firm value. Moreover, although a consensus definition of the term *tax risk* does not yet exist, we acknowledge that tax risk is a multifaceted construct and that a view of tax risk as the dispersion of potential outcomes likely

only captures certain facets of that construct. However, our definition of tax risk aligns with overall firm risk measures and captures information that is readily available to capital market participants, making it a natural measure to examine the valuation impact of tax risk.

8. McGuire, Neuman, and Omer (2013) proxy for the sustainability of tax avoidance using the coefficient of variation, which is calculated as the 5-year standard deviation of cash ETRs scaled by the mean of cash ETR measured over the same period. This measure captures both constructs we seek to differentiate, the level and the volatility of tax outcomes.
9. Moreover, in our sample, we find that our measures of tax avoidance and tax risk are significantly *negatively* correlated.
10. In an untabulated additional analysis (available in the Online Appendix), we include a control for the cost of equity and find that our inferences remain unchanged.
11. In an untabulated additional analysis, we combine our constructs of tax avoidance and tax risk and examine investor valuation of the coefficient of variation of our tax avoidance measure, equivalent to the inverse of Jacob and Schütt (2015)'s tax planning score. Our results are qualitatively similar to theirs.
12. We choose cash ETRs as our measure of tax avoidance for two primary reasons. First, cash ETRs capture the broadest spectrum of tax avoidance (e.g., temporary and permanent differences, aggressive and nonaggressive strategies) whereas other measures such as tax shelter scores or permanent BTDs only capture specific types of transactions. Second, as we are examining investor valuation, we use measures of tax avoidance and tax risk that are readily available to investors. Compared with other tax avoidance proxies, ETRs are particularly salient to investors in firms' financial statements.
13. We use sales rather than total assets to control for size because total assets is a component of our dependent variable, *TOBINQ*.
14. Given our large set of control variables, we calculate variance inflation factor (VIF) scores for our primary tests. We find that the maximum VIF among the uninteracted control variables is 3.82, while the maximum VIF among the interacted controls is 5.43. Thus, we believe that multicollinearity is not a significant concern in our models.
15. To maximize our sample size, we set *NOL, FOREIGN, R&D, ADVERTISING*, and *INTANGIBLES* equal to zero if missing. We note that our results are not sensitive to this design choice. We also obtain qualitatively similar results if we exclude these control variables.
16. Note that this sample selection omits firms with current period losses and firms with cumulative losses over the period $t-4$ to t. In untabulated analyses, we also exclude observations reporting negative pretax income in *any* year between $t-4$ and t because of differing tax incentives and potential volatility in cash ETRs induced by annual losses, which may affect our measure of *TAXRISK*. We find that our results are robust to using this more restrictive sample.
17. To mitigate concerns regarding extreme observations and/or data errors in our sample, we winsorize all continuous variables except *TAXAVOID* and *TAXRISK* at the 1% and 99% levels. In untabulated robustness tests, we note that our results are qualitatively unchanged if we also winsorize *TAXAVOID* and *TAXRISK* at 1% and 99% or winsorize at values of zero and one.
18. The two control variables that vary from intuition are *DEPRECIATION* and *INTANGIBLES*. As proxies for total intangible intensity, we expect that depreciation expense will be negatively associated with *TOBINQ* and recorded intangibles will be positively associated with *TOBINQ*. We consistently find the opposite effect. We note that Barth, Kasznik, and McNichols (2001) also observe signs contrary to expectation for these two controls, and Comprix, Graham, and Moore (2011) observe signs contrary to expectation for recorded intangibles.
19. As an additional analysis (available in the Online Appendix), we estimate Model 1 separately for each quintile of *TAXRISK*. Consistent with tax risk attenuating the positive valuation of tax avoidance, we find the coefficient on *TAXAVOID* is greatest in the lowest quintile of tax risk and lowest in the highest quintile of tax risk.

20. We obtain these figures by calculating predicted values based on the coefficients from Model 3 presented in Table 4 and the descriptive data presented in Table 2.
21. We acknowledge that as *TAXAVOID* is the weighted average cash ETR over the years $t-4$ to t, and *TAXRISK* is the volatility of cash ETRs over the same period, we would expect the interaction of the two to be negatively associated with *FUTURE_TAXAVOID* because the persistence of any long-term measure would likely be impaired by volatility in that same measure.
22. In particular, we calculate *GTAXAVOID* as total tax expense over the period $t-4$ to t scaled by total pretax income over the same period, multiplied by negative one (–1). We calculate *GTAXRISK* as the 5-year (period $t-4$ to t) standard deviation of annual GAAP ETRs. We also impose similar additional sample restrictions as in our cash ETR tests, namely, deleting observations with a negative numerator or denominator in the 5-year GAAP ETR calculation and observations with GAAP ETRs or standard deviation of annual GAAP ETRs greater than 100%.
23. Prior to FIN 48, firms recorded all contingent liabilities (including tax liabilities) in accordance with FAS 5, which required a ''probable'' and ''measureable'' standard. This standard is considered to be less conservative than the ''more likely than not'' required by FIN 48. Furthermore, many firms did not separately disclose this liability in the financial statements (Gleason & Mills, 2002).
24. Prior research documents that earnings manipulations may occur via the tax reserves (e.g., Cazier, Rego, Tian, & Wilson, 2015; Gupta, Laux, & Lynch, 2016). However, Lisowsky, Robinson, and Schmidt (2013) use confidential tax return data to validate that UTBs are correlated with a firm's likelihood of engaging in tax shelters, suggesting that UTBs may be informative to investors despite the subjectivity inherent in their calculation.
25. Our measures of tax avoidance and tax risk are each 5-year measures calculated over the period $t-4$ to t. Although the UTB balance is a single-year measure, it reflects current open positions, the outcomes of which have not been ultimately resolved. In addition, UTB is a balance sheet account and is thus cumulative in nature, whereas our measures of tax avoidance and tax risk are calculated using income statement accounts. Therefore, we consider them complementary measures over similar time periods.

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