DOES THE DIVERSIFICATION OF TAX STRATEGIES AFFECT TAX RISK?

by

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DISSERTATION ABSTRACT

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Title: Does the Diversification of Tax Strategies affect Tax Risk?

I investigate the effect that the number of different tax strategies employed by a public company has on the relation between measures of corporate tax avoidance and measures of risk. Prior studies have generally failed to find a relation between measures of overall firm risk (such as stock return volatility) and measures of corporate tax avoidance (such as low effective tax rates). One possible reason for this empirical result is the failure to consider the role that the diversification of tax risk, through utilization of a portfolio of different tax avoidance strategies, might have on reducing tax risk and, as a result, on reducing overall firm risk. I create a broad measure of diversification based on five sources of tax benefits. Controlling for the level of tax avoidance, I regress measures of risk on diversification and an interaction term and find weak support that diversification reduces tax risk, as measured by the volatility of future cash ETRs, and mixed evidence on the effect of diversification on overall firm risk, as measured by the volatility of future monthly stock returns.

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CHAPTER I

INTRODUCTION

Prior studies have generally failed to find a relation between measures of overall firm risk (such as stock return volatility) and measures of corporate tax avoidance (such as low effective tax rates). I propose that one reason for this mixed evidence is that as firms engage in more tax avoidance, they add additional tax strategies, which has the effect of diversifying their tax planning.[1] Drawing on portfolio theory, diversification reduces the overall risk of the portfolio without reducing the expected return. Considering tax planning as an overall portfolio of tax strategies, adding additional tax strategies increases the diversification and, depending on the covariance of the payoffs from the different strategies, may reduce overall tax risk. Thus, in this paper I investigate whether the diversification of tax strategies affects tax risk and, as a result, overall firm risk.[2]

A significant focus of recent tax accounting research is to explain variations in corporate tax avoidance, and why some firms are able to exhibit lower effective tax rates (ETRs) than others. A number of studies show that this variation can be partially explained by firm characteristics such as size (Zimmerman (1983)), ownership structure (Chen, Chen, Cheng, and Shevlin (2010)), corporate governance (Desai, Dyck, and Zingales (2007)), and subsidiary locations (Dyreng and Lindsey (2009)). Others have reasoned that certain types of tax avoidance are more aggressive and riskier. Lisowsky,

[1] I define a "tax strategy" as a specific plan to reduce the amount of income tax otherwise owed. I define the broader term "tax planning" as the overall goal to reduce the amount of income tax owed, composed of one or more specific tax strategies.

[2] In finance, diversification is the process of allocating capital in one's portfolio to a mix of different investments in a way that reduces exposure to any one particular asset, thereby reducing overall risk. Thus, by this technical definition, diversification means a reduction in risk. However, in applying this concept to a tax avoidance setting, I use a more general definition of the term, an increase in the number of items or strategies. Thus, I consider the effect of the diversification of tax strategies on tax risk to be an empirical question.

Robinson, and Schmidt (2013) describe tax avoidance as a continuum ranging from perfectly legitimate, to more aggressive permanent book tax differences, to the most aggressive tax positions, such as tax sheltering.[3] Thus, more tax avoidance could suggest a firm's willingness to accept more risk. Building on agency theory and the assumption that managers are risk-averse, several studies suggest that this managerial aversion to risk drives variations in the level of tax avoidance (Chen and Chu (2005); Rego and Wilson (2012); Bardertscher, Katz, and Rego (2013); Graham, Hanlon, Shevlin, and Shroff (2014)).

Consistent with this idea that there are risks associated with tax avoidance, the practitioner literature has focused on the importance of tax risk management (Arlinghaus (1998); Goodman (2004)). Along with other firm-specific risks, managers regularly discuss tax-related risks and plans to address these risks as part of their annual SEC filings. Tax risk is also increasingly discussed with revenue authorities worldwide, leading Big 4 accounting firms to publish surveys and guides for their clients on the importance of managing tax risk (PricewaterhouseCoopers (2004); Ernst & Young (2014)).

Despite the practitioner focus on reducing tax risk, it has been difficult for researchers to identify a relation between tax avoidance and risk. The literature finds that some firms are able to sustain tax avoidance in the long run (Dyreng, Hanlon, and Maydew (2008)) and that higher levels of tax avoidance do not necessarily result in higher risk (Guenther, Matsunaga, and Williams (2017) and Guenther, Wilson, and Wu

[3] As Lisowsky et al. (2013) describe, tax sheltering is composed of tax positions that have little or no business purpose, but generate tax benefits that the tax authority will most likely disallow. Thus, these tax positions have the weakest facts and the highest amount of uncertainty.

(2018)). Wilde and Wilson (2018) summarize academic research on corporate tax planning and our limited understanding of how these two concepts of tax avoidance and tax risk are associated.

One possible reason for this empirical result is the failure to consider the role that the diversification of tax risk, through utilization of a portfolio of different tax avoidance strategies, might have on reducing tax risk and, as a result, on reducing overall firm risk. Thus, I investigate the effect that the number of different tax strategies employed by a public company has on the relation between measures of corporate tax avoidance and measures of risk.

As described by Dyreng, Hanlon, and Maydew (2018), a precise definition of tax risk is not yet agreed upon in the tax literature, but the concepts of risk, uncertainty, and aggressiveness, with regard to tax, are related. Prior researchers have focused on the uncertainty of whether a firm will have to repay tax savings in the future (Dyreng, Hanlon, and Maydew (2018), Hanlon, Maydew, and Saavedra (2018), and Bauer and Klassen (2014)) and uncertainty regarding a firm's future tax payments (Guenther, Matsunaga, and Williams (2016)). Neuman, Omer, and Schmidt (2018) draw on broad definitions of risk and define tax risk as "the uncertainty about future tax outcomes generated by current actions or activities, or the failure to take actions or pursue activities." Drake, Lusch, and Stekelberg (2017) focus on a more classical finance definition and define tax risk as "the dispersion of potential outcomes from tax avoidance."

Drawing on this, for purposes of my study, I define tax risk as the likelihood that the tax outcome differs from what is expected. In other words, the actual amount of tax

ultimately avoided (after audits by the tax authorities, or the expiration of the statute of limitations) is different from what was planned. This results from the dispersion of potential outcomes or payoffs from a tax avoidance strategy due to, for example, uncertainty in the application of tax law, uncertainty over the facts of a situation, uncertainty over how well a firm's accounting system arrives at the tax result, and uncertainty over whether a tax action will subject the firm to adverse attention. Consistent with this view, I measure tax risk as the dispersion, or variance, of tax outcomes from particular tax strategies, using the volatility of future cash effective tax rates (ETRs) over five years.[4] As an indirect way to capture tax risk, I also use firm risk, defined as the standard deviation of monthly stock returns over the subsequent year.

While I am interested in the diversification of tax strategies, empirically I cannot observe which specific tax strategies managers employ in their tax planning. Thus, I create a measure of diversification that uses broad categories of book-tax differences (BTDs) as the sources of tax benefits. While each broad category may have tens or hundreds of underlying and unobservable individual tax positions, to the extent that a firm has more diverse broad categories of tax avoidance, it follows that the firm has more diverse underlying tax strategies. Despite measuring diversification at this relatively high level, I still find significant variation in the extent to which firms rely on a single category or source of tax avoidance versus multiple sources. Finally, if I could observe the underlying individual tax positions, it is likely that many would be highly correlated, and thus diversification may not have as great of an effect on tax risk. However, by using

[4] In probability theory, variance is the expected value of the squared difference of a random variable (the actual outcome) from its mean (the expected outcome) and represents the dispersion or spread of the random variables about the mean. Thus, this mathematical definition of variance is what my definition of tax risk captures.

broader categories to measure diversification, it is less likely that each broad category is highly correlated.

To create these broad categories for my measure of diversification, I estimate the amount of tax avoided as thirty-five percent of total BTDs. This avoided tax is then separated into tax that is permanently avoided or tax that is temporarily avoided by deferring it to a future year. Each group is further separated into tax avoided on domestic or foreign source income. In addition, managers may also engage in state tax planning to source domestic income to states with little or no corporate income tax. To estimate a State BTD, I compare each firm's state tax expense to the maximum corporate state tax rate of the state in which the firm is headquartered. Therefore, I divide total tax avoided into five sources, or "buckets," of tax benefits: *Permanent Foreign BTD, Permanent U.S. BTD, Temporary Foreign BTD, Temporary U.S. BTD,* and *State BTD*. Thus, in any given year, a firm may avoid tax by utilizing up to five buckets. Over 5 years (3 years), the firm may avoid tax through 25 buckets (15 buckets). My measure of diversification, *Diverse*, is a continuous variable of the number of buckets utilized over the 5 years (3 years). In subsequent tests, I also use an indicator variable equal to one if the firm has high levels of diversification, and zero otherwise.

In my main tests, I examine the relation between diversification and tax risk, measured as the standard deviation of annual cash ETRs over the next five years, as well as the effect of diversification on the relation between tax avoidance and tax risk. I regress tax risk on measures of tax avoidance (*TaxAvoid*), *Diverse*, and an interaction term between the two, along with control variables from Guenther et al. (2017). Using the continuous measures of *Diverse*, across my five-year and three-year measures, the

coefficient on *Diverse* is negative and statistically significant. This provides support for my hypothesis that holding the firm's on-average expected tax savings constant, firms with high diversification have lower tax risk than firms with low diversification. Across all measures, the coefficient on the interaction term *Diverse x TaxAvoid* is negative, but it is only statistically significant when using two of my four *TaxAvoid* measures. Thus, overall I find mixed results in support of the second part of my hypothesis that high diversification mitigates the positive relation between tax avoidance and tax risk. My results using the indicator variable of *Diverse* are similar.

To indirectly test my hypotheses, I repeat my main test, replacing tax risk with a measure of firm risk, as I assume that tax risk is included within this overall measure. I find weaker and statistically insignificant results using all measures. Together, I find mixed evidence on the effect of diversification on the relation between tax avoidance and overall firm risk. Overall, these results support findings from prior literature that there is no relation between tax avoidance and overall firm risk. Thus, while I do find weak support for the effect of diversification on tax risk, in general I do not find an effect on firm risk. In additional analysis, I find that tax spikes capture the concept of an unexpected tax outcome and proxy for tax risk. I continue to find weak support for my hypotheses using the incidence of tax spikes in the future 3 or 5 years as my measure of tax risk.

Overall, my study contributes to the literature on the relation between tax avoidance and tax risk by introducing a new dimension, the concept of tax diversification. While prior researchers have failed to find a relation between tax avoidance and risk, I find a positive relation in my sample, using tax risk. I also find

weak, mixed support that diversification reduces tax risk and mitigates the effect of tax avoidance on tax risk. Therefore, I contribute to prior literature by proposing an explanation on why although avoiding tax is thought to be risky, empirically researchers have been unable to find a relation.

CHAPTER II

DIVERSIFICATION

Tax avoidance can broadly be defined as the reduction of a firm's explicit tax liability (Hanlon and Heitzman (2010)). Firms may be able to achieve a certain level of tax avoidance with no additional cost or risk in their normal course of business by taking advantage of tax incentives embedded in the tax law. This level of tax avoidance depends on available opportunities, and varies by firm, depending on circumstances and industry. For example, firms engaged in research and development as part of their business strategy will benefit from R&D tax credits, while other firms will not. However, if a manager wants to increase the amount of the firm's tax avoidance beyond this basic level, she must engage in some sort of tax planning. There are non-trivial costs involved in tax planning, such as creating an internal tax department, paying for outside tax services, or legal and accounting costs to carry out a specific tax strategy. Thus, when a firm engages in tax planning, managers are making an investment in tax avoidance.

The return on the investment is the expected or planned tax savings. However, there is some probability that the initial amount of the planned tax savings will not be achieved. Planned tax savings can be reduced in several ways. First, if audited, the firm may have to repay a portion of the savings, plus penalties and interest, if the tax authority successfully challenges the position during the audit. Second, before a tax strategy is completed, the tax law could change such that savings in future years are reduced or eliminated. Tax savings may never be realized due to failures within the tax strategy, such as a miscommunication between key business units. Finally, tax savings could be

offset by additional unforeseen costs such as reputational or political costs. The likelihood of any of these happening depends on the particular tax strategy.[5]

FIN 48 (now codified in ASC 740-10) establishes a "more-likely-than-not" threshold for reporting uncertain tax positions in the financial statements, suggesting that firms engage in tax strategies knowing that the final amount of tax savings may not be the same as the initial amount of planned tax savings. While firms may engage in a tax strategy with an initial amount of planned tax savings in mind, after factoring in the probabilities of reduction, there is an on-average amount of expected tax savings. The dispersion, or variance, of the possible amounts of final tax savings, compared to this on-average expected tax savings, represents tax risk for the purpose of my study.

Each tax strategy has its own distribution of possible tax outcomes, with each outcome having a probability of occurring. If this distribution has a high variance, then the amount by which the firm could miss their expected return (the on-average expected tax savings) is large. This would represent higher tax risk because the firm could end up with tax savings much lower than expected. As an example, consider Firm A, which has one tax strategy. This strategy has two possible outcomes: the tax strategy is either successful or it fails. There is an eighty percent chance Firm A will end up with one hundred dollars of planned tax savings, and a twenty percent chance Firm A will end up with nothing. Thus, the on-average expected savings is eighty dollars. However, although on average Firm A expects to end up with eighty dollars of tax savings, if the tax strategy

[5] To the extent the tax avoidance strategy results in a financial reporting problem (such as a restatement), or fails to provide a financial reporting benefit in the form of a lower tax expense, this could also reduce the expected benefit from the tax strategy.

fails, Firm A ends up with the much lower amount of zero tax savings. The variance of the possible two tax outcomes represents my measure of tax risk.

Drawing again on portfolio theory, diversifying a portfolio will reduce the overall variance of a portfolio's payoffs, provided that the payoffs of each individual asset are not perfectly correlated. To continue the example, consider a second firm, Firm B, which plans to avoid the same one hundred dollars of tax as Firm A. However, Firm B has two tax strategies that are perfectly correlated, planning to save fifty dollars each. These two strategies have the same possible outcomes as Firm A's strategy: either both strategies succeed, or both strategies fail. For each strategy, there is an eighty percent chance Firm B will end up fifty dollars, and a twenty percent chance Firm B will end up with nothing. Thus, adding the two together, the on-average expected tax savings of the two strategies is eighty dollars, the same as Firm A. If these two strategies are perfectly correlated, the variance of the possible outcomes for Firm B is the same as Firm A. If both strategies fail, Firm B gets nothing. If both strategies succeed, Firm B gets one hundred dollars of savings. Thus, Firm A and Firm B have the same tax risk.

However, if the outcomes of the two strategies are not perfectly correlated, then there is a third possible outcome. Both strategies succeed, both strategies fail, or one strategy succeeds and one fails. The possible outcomes are now one hundred, fifty, or zero dollars.[6] Thus, even though both Firm A and Firm B expect eighty dollars of tax savings on average, if Firm B misses that amount, they could still end up with fifty dollars of tax savings. The less correlated the two strategies are, the more likely the fifty

[6] The probability of both strategies having a zero payoff is 0.2 x 0.2 = 0.04. The probability of both strategies having a $50 payoff is 0.8 x 0.8 = 0.64. The probability of one strategy having a zero payoff and the other having a $50 payoff is 2 x 0.8 x 0.2 = 0.32. ($0 x 0.04) + ($100 x 0.64) + ($50 x 0.32) = $80, the expected payoff.

dollar outcome. Thus, having two strategies that are not perfectly correlated reduces the variance of the overall tax planning of Firm B and reduces the amount by which Firm B could miss their expected tax savings. Firm B has lower tax risk.[7]

In sum, holding the on-average expected tax savings constant, increasing the number of strategies shrinks the variance of the tax planning portfolio, making the distribution of outcomes closer to the expected tax savings amount. Therefore, tax risk is reduced to the extent the distribution of possible outcomes gets closer to the expected tax savings.

As a more general analogy, tax avoidance can be thought of as creating a contingent liability, where a potential tax expense (the tax liability) may occur depending on the outcome of uncertain future events (e.g., the firm's success in carrying out tax avoidance, the potential for IRS audits, or the potential for negative public attention, to name a few). While the potential tax expense can be reasonably estimated, the final amount and thus the final amount of tax avoidance depend on these uncertain, future events.

One common type of contingent liability is a lawsuit. For example, assume a firm is sued for damages of $100, and the manager believes there is a 25 percent chance the firm will lose the lawsuit. Thus, the expected future cash outflow is $25, but the only two possible actual outcomes are $100 (a 25 percent chance of losing the lawsuit) or $0 (a 75 percent chance of winning the lawsuit). A second type of contingent liability is warranty expense. Assume a firm sells ten units. There is a 25 percent chance that each unit will need to be repaired under warranty, costing the firm $10 per unit repaired. Thus, with this

[7] The variance of the single strategy for Firm A is 1,600, while the variance of the two strategies for Firm B (assuming the outcomes are uncorrelated) is 800.

type of contingent liability, the expected future cash outflow is still $25, but now there are eleven possible actual outcomes, ranging from a cash outflow of $100 (all ten units are repaired), to $90 (nine units are repaired), and so on to $0 (none of the units are repaired). Despite the same $25 expected future cash outflow from both contingent liabilities, the larger number of possible actual outcomes leads to a smaller variance for the warranty, as compared to the lawsuit.

Thus, relating back to tax avoidance, with just a single tax avoidance strategy that either succeeds or fails, the variance of the future cash outflows (taxes) behaves like that of the lawsuit. However, the more tax avoidance strategies the firm employs, or the more the firm diversifies their tax planning, the more the variance of the future cash outflows behaves like that of the warranty. Increasing the number of potential outcomes can reduce the variance, and thus reduce tax risk.

CHAPTER III

HYPOTHESES

The concept of diversification can be summarized in the popular idiom “don’t put all your eggs in one basket.” Markowitz (1952, 1959) introduces diversification in portfolio theory, where an investor constructs their portfolio of investments to minimize their risk for a given level of expected return, thus creating an efficient portfolio. Risk depends not only on the variance of each individual asset in the portfolio, but also on the correlation, or covariance, between every two individual assets. Thus, diversifying a portfolio by including assets with unrelated risk will reduce the overall risk of the portfolio. Applying this to a corporate tax avoidance setting, engaging in tax planning represents an investment in tax avoidance. The overall goal of reducing the amount of income tax owed is carried out through specific tax strategies. While each strategy has an initial amount of planned tax savings, the final outcome may be different than planned. Based on the probability of each outcome, each tax strategy has an on-average expected amount of tax savings and a distribution of possible outcomes. The dispersion, or variance, of these outcomes represents tax risk. If a firm diversifies their tax planning portfolio with multiple tax strategies whose outcomes are not perfectly correlated, then the variance of their overall outcomes is reduced.

Thus, regardless of the riskiness of the level of tax avoidance, the diversification of tax strategies can reduce risk through the reduced variance of outcomes. Whether a diversified firm has a Cash ETR of 20 percent or 30 percent, the tax outcome is less volatile, as compared to a non-diversified firm. In addition, for a given level of tax avoidance, the diversification of tax strategies can reduce the effect of tax avoidance on

tax risk. Comparing two firms that avoid more tax with a Cash ETR of 20 percent, the more diverse firm is less risky. Therefore, I hypothesize that:

H1(a): Ceteris paribus, for a given level of tax avoidance, the diversification of tax strategies reduces tax risk.

H1(b): Ceteris paribus, for a given level of tax avoidance, the diversification of tax strategies mitigates the effect of tax avoidance on tax risk.

However, there are several potential reasons why diversification could increase the variance of possible outcomes, and thus increase tax risk. First, adding certain tax strategies could affect the likelihood of a tax strategy failing. For example, if a firm has subsidiaries in multiple countries including one tax haven, audit risk and reputational risk might increase if the firm diversified by adding subsidiaries in two additional tax havens. In such a case, the more diversified a firm's tax strategies are, the more exposure there is for a regulatory authority or the public to take notice. This could increase the likelihood that both strategies fail, increasing the variance of the possible outcomes, and increasing tax risk.

Second, more strategies could increase the complexity of the firm's operations, which could lead to a greater risk of accounting errors, affecting the probability of the tax savings failing to materialize as expected. This in turn would affect tax risk due to the increased variance of the outcomes. Thus, diversification could add new potential outcomes that would not be present without increased diversification.

Third, increasing the number of tax strategies and the complexity of the tax function could provide managers with more opportunities to divert earnings, increasing the risk of managerial theft (Desai and Dharmapala (2006)). This could cause the firm to

miss the on-average expected tax savings, increasing tax risk. Finally, diversification of tax strategies may fail to reduce tax risk if the potential outcomes of the tax strategies are highly correlated. In this case, the firm would be adding additional strategies to their tax planning portfolio without any benefits of diversification. In sum, the predicted effect of diversification is unclear. Thus, in testing my two hypotheses, I view the effect of the diversification of tax strategies on tax risk as an empirical question.

CHAPTER IV

RESEARCH DESIGN AND RESULTS

Sample Selection and Variable Definitions

Table 1 summarizes my sample selection procedure. I begin by closely following the sample selection procedures from Guenther et al. (2017), extended to more recent years. I refer to this sample as the GMW Replication sample. I begin with all U.S. incorporated observations in Compustat from 1987 to 2017 with available data. For the 5-Year (3-Year) sample, each firm is required to have data for five (three) consecutive years to calculate the *TaxAvoid* measure, as well as a sixth (fourth) consecutive year to calculate the monthly stock return volatility over the subsequent year. In addition, I require sufficient data to calculate all control variables. One deviation from the Guenther et al. (2017) sample selection process is that I also require the *TaxAvoid* measure to be calculated entirely post-FAS 109, as this is a requirement for my measure of diversification.[8] Thus, because I require five (three) years of data post-FAS 109 and one year of future data, my GMW replication sample period effectively runs from 1997 – 2016 (1995 – 2016) for the 5-Year (3-Year sample), while the Guenther et al. (2017) sample period effectively runs from 1992 – 2010 for their stock return volatility tests.

I further limit my sample, the Diversification sample, and eliminate all observations with insufficient data to calculate my measure of diversification. I exclude all observations with negative pretax income, as well as observations missing current and

[8] Statement of Financial Accounting Standards No. 109 (FAS 109), codified as ASC 740, is effective for fiscal years beginning after December 15, 1992. FAS 109 established basic principles of accounting for income taxes, including deferred tax liabilities and assets. Because my measure of diversification is calculated using "buckets" of current and deferred income taxes, I require *t*-4 (*t*-2) for the 5-Year (3-Year) sample to be no earlier than 1993.

deferred taxes and pretax domestic and foreign income. In addition, I require firms to overall avoid tax over the 5-Year (3-Year) period. My Firm Risk sample for tests using stock return volatility consists of 11,859 (16,587) observations for the 5-Year (3-Year) sample. Finally, tests using future cash ETR volatility require five future years of data, limiting my Tax Risk sample to 7,123 (9,951) observations for the 5-Year (3-Year) sample.

I create two measures of *TaxAvoid*, focusing on the level of tax avoidance managers expect when engaging in tax planning. Although managers enter into a tax strategy with an initial amount of planned tax savings in mind, after factoring in the probabilities of reduction, there are multiple potential outcomes. Thus, there is an on-average amount of expected tax savings. I first measure this expected tax avoidance as the average cash ETR (defined as cash taxes paid over pretax income less special items) over five (three) years. I winsorize the tax rates to fall between zero and one to aid in interpretation. Finally, I multiply the tax rates by negative one, so that *5-Year TaxAvoid* (*(3-Year TaxAvoid)* are increasing in tax avoidance.

My second measure is *5-Year Adjusted TaxAvoid (3-Year Adjusted TaxAvoid)*, calculated as the firm's five year (three year) cash ETR subtracted from the average (median) cash ETR for the firm's size/industry portfolio over the same five year (three year) period. This variable is increasing in tax avoidance. Rational expectations theory suggests that although managers may miss the on-average amount of expected tax savings some of the time, on average they will be correct.[9] By incorporating previous tax

[9] Rational expectations theory is an economic theory proposed by John Muth in his 1961 paper " Rational Expectations and the Theory of Price Movements," published in *Econometrica*. The theory suggests that economic outcomes will generally be what people predict. While they may be in error sometimes, errors are infrequent and random, and thus on average people are correct.

savings, on average this amount represents what managers estimated the expected tax savings to be. Thus, using these two five-year (three-year) average measures of tax avoidance should represent the on-average amount of expected tax savings.

Because I define tax risk as the dispersion, or variance, of tax outcomes from particular tax strategies, I focus on measures of risk in the literature that reflect volatility. Guenther et al. (2017) find that the volatility of cash ETRs is associated with future stock volatility, suggesting a relation to firm risk. Based on this, subsequent researchers have measured tax risk as the five-year standard deviation of annual cash ETRs (Hutchens and Rego (2015); Drake, Lusch, and Stekelberg (2017); Abernathy, Rapley, and Stekelberg (2017); Campbell, Cecchini, Cianci, Ehinger, and Werner (2017)). This measure captures fluctuations in the cash ETR due to temporary, nonrecurring strategies, as well as a tax strategy failure. It captures any reversal upon audit by tax authorities, and in addition, within each cash ETR it will capture the failure of a tax strategy to avoid as much tax as expected (resulting in a higher cash ETR). Thus, I use the five-year standard deviation of annual cash ETRs as my first measure of risk, *TaxRisk*.

One limitation of this measure is that although it is a more direct measure of tax outcomes, it does not capture any unforeseen costs of a tax strategy, such as reputational costs, as these costs would not be included in a cash ETR. I assume that the variance of tax outcomes, my definition of tax risk, will be indirectly reflected in the overall volatility of the firm. Thus, for my second measure of tax risk I want to capture overall firm risk. To do this I measure *FirmRisk* as stock return volatility, calculated as the standard deviation of monthly stock returns over the subsequent year.

Descriptive Statistics

Panels A and B of Table 2 presents descriptive statistics for the larger GMW Replication sample and my smaller Diversification sample, respectively. The mean (median) *5-Year TaxAvoid* of -22.16 percent (-24.29 percent) in the Diversification sample is less negative than the mean (median) of -27.03 percent (-26.09 percent) in the GMW replication sample. Thus, firms in the Diversification sample avoid more tax, consistent with my sample selection requirement that firms in this sample are overall tax avoiders. Firms in the Diversification sample also avoid more tax compared to peers in their industry/size portfolio, with the mean of *5-Year Adjusted TaxAvoid* at 0.74 percent compared to -2.05 percent in the GMW Replication sample. In addition, firms in the Diversification sample are larger and less volatile in terms of *TaxRisk* and *FirmRisk*. Finally, 14.09 percent of firms in the GMW Replication sample have losses in the current year, while the Diversification sample excludes all firms with losses.

Panel C of Table 2 presents the industry composition of both samples using the Fama-French 49 industry codes. The largest industries in both samples include Retail, Business Services, Electronic Services, and Computer Software. In general, the industry composition of the two samples is similar, with a few exceptions. The GMW Replication sample has a larger percentage of firms in Utilities (4.27%) and Banking (7.31%), as compared to the Diversification sample (1.27% and 1.52%, respectively). Lastly, the Trading industry comprises 11.40% of the Diversification sample, compared to 7.12% of the GMW Replication sample.

Test of Findings from Prior Literature

Since prior literature fails to find a relation between tax avoidance and firm risk, I first replicate this finding using the GMW Replication sample and estimate the following regression model using control variables from Guenther et al. (2017):

$$\begin{aligned} FirmRisk_{i,t} = {} & \beta_0 + \beta_1 TaxAvoid_{i,t} + \beta_2 PTBI_{i,t} + \beta_3 Vol\_PTBI_{i,t} + \beta_4 BTM_{i,t} \\ & + \beta_5 Leverage_{i,t} + \beta_6 Size_{i,t} + \beta_7 Shares\_Out_{i,t} \\ & + \beta_8 Vol\_SpecialItems_{i,t} + \beta_9 Vol\_CashFlow_{i,t} + \beta_{10} Vol\_ETBSO_{i,t} \\ & + \beta_{11} ETBSO_{i,t} + \beta_{12} CHG\_NOLCF_{i,t} + \beta_{13} NOLCF_{i,t} + \beta_{14} Loss_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where *FirmRisk*, as discussed above, is the standard deviation of monthly stock returns over the subsequent year. I use two measures of tax avoidance, *5-Year TaxAvoid* and *3-Year Adjusted TaxAvoid* to follow prior literature. All other control variables are defined in Appendix A. Table 3, columns 1 and 2, present the results. Consistent with prior literature, I fail to find a significant relation between tax avoidance and firm risk, for both the 5-Year and Adjusted 3-Year measures, and in fact, the coefficients on both measures suggest tax avoidance is not risky, though not statistically significant at conventional levels.

I next estimate Equation (1) with both measures of *TaxAvoid* using my smaller Diversification sample. Table 3, columns 3 and 4, present the results. Consistent with prior literature, I again fail to find a significant relation between tax avoidance and risk. However, I do find a positive, though statistically insignificant, coefficient on *TaxAvoid*, suggesting that for this sample, as tax avoidance increases, firm risk may increase as well. I also replace *FirmRisk* with *TaxRisk*, and estimate Equation (1). Table 3, columns 5

and 6, present the results. For the Diversification sample, as tax avoidance increases, tax risk increases as well, though not statistically significant at conventional levels.

Overall, these results differ from prior literature, suggesting that for my Diversification sample, tax avoidance may be risky. I attribute this difference to my more restrictive sample limitations resulting in a different sample composition. I estimate (not tabulated) Equation (1) using the 30,664 (30,508) observations included in the GMW Replication sample, but excluded from my Diversification sample, using *5-Year TaxAvoid* (*3-Year Adjusted TaxAvoid)* and continue to find a negative, though not statistically significant, coefficient on *TaxAvoid.* This suggests that my smaller Diversification sample behaves differently from the majority of the GMW Replication sample, and suggests that the prior finding of an insignificant relation between tax avoidance and firm risk from prior literature may not hold for all sets of firms. This is consistent with Hutchens, Rego, and Williams (2019), who examine the relation between tax avoidance and firm risk using latent class mixture models and find that this relation varies across different groups of firms.

Diversification Measurement and Descriptive Statistics

While the focus of this paper is on the diversification of tax strategies, empirically I cannot observe which tax strategies managers employ in their tax planning. What I can observe, however, is the outcome of these tax strategies in the form of how much tax a firm has avoided, compared to the U.S. statutory rate of thirty-five percent. In addition, I can observe that these benefits of tax avoidance seem to come from different sources. As an example, these sources could include permanently avoided tax from municipal bond interest or temporarily deferred tax from accelerated depreciation. Although there can be

any number of tax strategies aggregating into one source of a tax benefit, to the extent that a firm has more diverse sources of tax benefits, it follows that the firm has more diverse underlying tax strategies. Thus, my measure of diversification reflects the diversification of the sources of benefits of tax avoidance, which in turn reflect the diversification of the underlying tax strategies.

My measure of diversification uses broad categories of book-tax differences (BTDs) as the sources of tax benefits. These include permanent U.S., permanent foreign, temporary U.S., and temporary foreign BTDs, as well as an estimated State BTD. By comparing the expected current year tax, measured as pretax income multiplied by thirty-five percent, to the firm's actual current year tax, I estimate the amount of tax avoided. This avoided tax can then be separated into tax that is permanently avoided or tax that is temporarily avoided by deferring it to a future year. Each group can further be separated into tax avoided on domestic or foreign source income.

The U.S statutory corporate tax rate is thirty-five percent, imposed on worldwide income, over the available sample period.[10] Thus, if firms do not avoid any tax, their expected current year U.S. tax on worldwide income should be:

$$Expected\ Tax\ = PI\ \times 35\%$$

where:

PI = pretax income, and observations with negative pretax income are excluded. However, the firm's actual current year tax is:

$$Actual\ Tax\ = TXFED\ + TXFO$$

[10] From 1993 to 2017, U.S. corporations were taxed using income tax brackets, with a maximum rate of 35 percent. The TCJA of 2017 eliminated the income tax brackets and imposed a flat corporate tax rate of 21 percent beginning in 2018. In addition, the TCJA of 2017 moves the U.S. from a worldwide tax system to a territorial tax system.

where:

TXFED = current U.S. tax expense

TXFO = current foreign tax expense

Comparing the two results in the amount of tax avoided:

$$Tax\ Avoided\ = Expected\ Tax\ - Actual\ Tax$$

Part of the tax avoided is deferred, or temporarily avoided. It is avoided in the current year, but is expected to be incurred in future years.

$$Temporarily\ Avoided\ Tax\ = TXDFED\ + TXDFO$$

where:

TXDFED = deferred U.S. tax expense

TXDFO = deferred foreign tax expense

If the tax is not temporarily avoided, it is permanently avoided.

$$Permanently\ Avoided\ Tax\ = Tax\ Avoided\ - Temporarily\ Avoided\ Tax$$

During the available sample period, prior to the Tax Cuts and Jobs Act of 2017, the income from foreign subsidiaries of U.S. multinational corporations (MNCs) is subject to U.S. corporate income tax.[11] However, active source income is not taxed until the income is repatriated, or paid as a dividend, back to the parent entity. Upon repatriation, the firm generally pays the difference between the U.S. and foreign tax rate.[12] For financial reporting purposes, if the operating earnings reinvested abroad in the

[11] The TCJA of 2017 moves the U.S. from a worldwide tax system to a territorial tax system, thereby eliminating most U.S. tax on active source foreign income beginning in 2018. However, it is not a pure territorial tax system, as the TCJA does include anti-base erosion measures such as a tax on Global Intangible Low-Taxed Income (GILTI) and a Base Erosion and Anti-Abuse Tax (BEAT).

[12] The amount of the dividend is grossed up by the foreign tax rate and that total amount is taxed at the U.S. statutory rate of thirty-five percent. The firm then receives a foreign tax credit for foreign taxes paid, which helps mitigate any impact from double taxation. Thus, the incremental tax owed upon repatriation can generally be thought of as the difference between thirty-five percent and the foreign tax rate.

foreign subsidiaries are designated as "indefinitely reinvested," the firm does not record a tax expense or deferred tax liability for the U.S. tax owed upon repatriation. Thus, the tax on indefinitely reinvested foreign earnings is generally considered to be permanently avoided.[13] Firms disclose the cumulative amount of IRFE in their annual filings. Comparing the prior year cumulative total to the current year cumulative total provides an estimation of the current year foreign earnings designated as indefinitely reinvested, *Estimated IRFE*.[14] I estimate the permanent foreign BTD as*:*

$$Permanent\ Foreign\ BTD\ = \left(35\%\ - \left(\frac{TXFO\ + TXDFO}{PIFO}\right)\right) \times Estimated\ IRFE$$

where:

PIFO = pretax foreign income

I assume *Permanent Foreign BTD* is zero for observations with zero or negative pretax foreign income.

The permanently avoided tax is composed of foreign and U.S. BTDs. Thus:

$$Permanent\ U.S.BTD\ = Permanently\ Avoided\ Tax\ - Permanent\ Foreign\ BTD$$

I assume that the incremental tax on current year foreign earnings not designated as indefinitely reinvested are deferred, as the tax is not current until the year in which the repatriation occurs. Thus, I estimate the temporary foreign BTD as:

[13] Firms report "indefinitely reinvested foreign earnings" (IRFE) as a permanent difference in the tax rate reconciliation in the income tax footnote. Because of this, IRFE are often referred to in the literature as "permanently reinvested earnings" (PRE).

[14] This information is available in the database Audit Analytics beginning in 2008. To estimate IRFE for firm-years missing this data, I multiply pretax foreign income by an average percent. The average percent is calculated as the median percent of pretax foreign earnings designated as IRFE each year pretax foreign income is greater than zero. IRFE is winsorized to range from zero to that year's total pretax foreign income.

$$Temporary\ Foreign\ BTD$$

$$= \left(35\% - \left(\frac{TXFO + TXDFO}{PIFO}\right)\right) \times (PIFO - Estimated\ IRFE)$$

I assume *Temporary Foreign BTD* is zero for observations with zero or negative pretax foreign income.

The temporarily avoided tax is composed of foreign and U.S. BTDs. Thus:

$$Temporary\ U.S.\ BTD$$

$$= Temporarily\ Avoided\ Tax - Temporary\ Foreign\ BTD$$

Finally, managers may also engage in state tax planning to source U.S. income to states with little or no corporate income tax. Although total state income taxes can also be separated into current and deferred taxes, most taxable income for state purposes conforms very closely to federal taxable income. Thus, a temporary BTD due to a timing difference would be reflected in both federal and state deferred taxes. In other words, the same temporary tax strategies used for federal tax avoidance will often manifest in state tax avoidance. Therefore, to avoid double counting tax strategies I focus on location as the dominant state tax strategy. To estimate the State BTD, I compare each firm's total state tax expense (current and deferred) to the maximum corporate state tax rate of the state in which the firm is headquartered:

$$State\ BTD = (Headquarters\ State\ Tax\ Rate \times PIDOM) - TXS - TXDS$$

where:

PIDOM = pretax domestic income

TXS = current state tax expense

TXDS = deferred state tax expense

Therefore, each year the total tax avoided arises from five sources of tax benefits, or "buckets": *Permanent Foreign BTD, Permanent U.S. BTD, Temporary Foreign BTD, Temporary U.S. BTD,* and *State BTD.*

Each positive "bucket" counts as one source of tax benefit, where each non-positive "bucket" counts as zero, for a potential sum of five per year. Using a five-year (three-year) measure, each firm has an opportunity to utilize 25 (15) buckets over that five-year (three-year) time period. *Diverse_Count25 (Diverse_Count15)* represent the total number of buckets each firm utilized. Since the firms in my Diversification sample avoid tax overall, *Diverse_Count25 (Diverse_Count15)* can range from 1 to 25 (15). Table 4 presents the distribution of *Diverse_Count25* and *Diverse_Count15*. The average firm avoided tax using 13.18 of 25 buckets over five years and 7.89 of 15 buckets over three years. In general, both measures have similar distributions with approximately one third of the sample avoiding tax using at least an average of three buckets per year, or 15 (9) buckets over five (three) years. My measure of diversification, *Diverse*, is the continuous variable *Diverse_Count25* or *Diverse_Count15* for tests using the five and three year measures, respectively.

Despite evidence from Dyreng et al. (2008) that some firms are able to sustain low ETRs for a long period of time, some firms are not able to sustain low ETRs and experience spikes in their tax rate, suggesting a prior tax position may have been overturned. I adapt my measure from Saavedra (2018) and define *Tax Spike 3-Year (Tax Spike 5-Year)* as an indicator variable equal to 1 if a firm has a cash tax payment equal to at least 60 percent of pre-tax book income (less special items) in any of the future three (five years), and zero otherwise. I graph the percentage of firms at each level of

diversification, using *Diverse_Count25* and *Diverse_Count15*, with a tax spike in the future three or five years. Figures 1 and 2 present the graphs for *Tax Spike 3-Year* and *Tax Spike 5-Year* for each level of diversification over five years (*Diverse_Count25).* Figures 3 and 4 present the graphs for *Tax Spike 3-Year* and *Tax Spike 5-Year* for each level of diversification over three years (*Diverse_Count15).* All four figures show that as diversification increases, the percentage of firms experiencing a tax spike in future years decreases, providing descriptive evidence that diversification may reduce tax risk (the likelihood of a tax outcome different from what was expected).

Main Regression

In H1(a), I hypothesize that holding tax avoidance constant, diversification reduces tax risk, and in H1(b), I hypothesize that diversification also mitigates the effect of tax avoidance on tax risk. To test H1(a) and H1(b), I estimate the following regression on my Diversification sample. I regress tax risk on tax avoidance, diversification, and the interaction term between the two, along with the control variables from Equation (1). I omit the *Loss* control variable from Equation (1) as firms in my Diversification sample are required to have positive pretax income each year.

$$\begin{aligned} TaxRisk_{i,t} = {} & \beta_0 + \beta_1 TaxAvoid_{i,t} + \beta_2 Diverse_{i,t} + \beta_3 TaxAvoid_{i,t} \times Diverse_{i,t} \\ & + \beta_3 PTBI_{i,t} + \beta_4 Vol\_PTBI_{i,t} + \beta_5 BTM_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Size_{i,t} \\ & + \beta_8 Shares\_Out_{i,t} + \beta_9 Vol\_SpecialItems_{i,t} + \beta_{10} Vol\_CashFlow_{i,t} \\ & + \beta_{11} Vol\_ETBSO_{i,t} + \beta_{12} ETBSO_{i,t} + \beta_{13} CHG\_NOLCF_{i,t} + \beta_{14} NOLCF_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \quad (2)$$

TaxRisk represents the standard deviation of future cash ETR over five years. *TaxAvoid* is one of the four measures of tax avoidance, *5-Year TaxAvoid* and *5-Year Adjusted*

TaxAvoid, as well as the 3-Year measures. *Diverse*, as described above, is either of the continuous variables *Diverse_Count25* and *Diverse_Count15*. All other variables are described in Appendix A.

Table 5, Panel A presents the results using the continuous *Diverse* measures. Across three of the four 5-Year and 3-Year measures of tax avoidance, the coefficient on *Diverse* is negative and statistically significant. This provides support for H1(a) that holding the firm's on-average expected tax savings constant (controlling for the tax avoidance in β_1), firms with high diversification have lower tax risk than firms with low diversification. Across three of the four 5-Year and 3-Year measures of tax avoidance, the coefficient on *TaxAvoid* is positive and statistically significant, suggesting that as tax avoidance increases, tax risk increases. The interaction term *Diverse x TaxAvoid* can be interpreted as how when a firm moves from low tax avoidance to high tax avoidance, diversification has more of a negative impact on tax risk. Across all measures, the coefficient is negative, but it is only statistically significant when using the *5-Year TaxAvoid* and *3-Year TaxAvoid* measures. This provides weak support for H1(b) that diversification reduces the positive relation between tax avoidance and tax risk.

Next, to aid in the interpretation of my results, I use predictive margins to examine the relation between tax risk and diversification at various levels of tax avoidance. I estimate and plot the slopes (not tabulated) of *TaxRisk* on *Diverse*, holding *TaxAvoid* constant at eleven different levels of low to high tax avoidance. The intersection point of these eleven lines of best fit provides a cut-off between low and high levels of diversification. Overall, across all four measures of *TaxAvoid*, when tax avoidance is low, higher diversification is predicted to yield more tax risk than lower

diversification. When tax avoidance is high, higher diversification is predicted to yield less tax risk than lower diversification. Said differently, when diversification is low, lower tax avoidance is predicted to yield less tax risk than higher tax avoidance. When diversification is high, lower tax avoidance is predicted to yield more tax risk than higher tax avoidance.

As a second measure of *Diverse*, I partition *Diverse_Count25* and *Diverse_Count15* into high and low diversification using the cut-off point provided by this predictive margins analysis. For the five-year (three-year) measures, firms are highly diversified if they utilize at least 19 (9) buckets over five (three) years. Thus, my second measure of diversification, *Diverse*, is an indicator variable equal to one if *Diverse_Count25* (*Diverse_Count15)* is 19 (9) or higher, and zero otherwise. Table 5, Panel B presents the results using the indicator variable *Diverse* measures. Across all 5-Year and 3-Year measures tax avoidance, the coefficient on *Diverse* is negative and the coefficient on *TaxAvoid* is positive, though much weaker than the results in Panel A using the continuous measures. The interaction term *Diverse x TaxAvoid* can be interpreted as how having more tax strategies (diversification) reduces the relation between tax avoidance and tax risk. Across all measures, the coefficient is negative, but it is not statistically significant at conventional measures. Overall, Panel B continues to provide weak support for H1(a) and H1(b).[15]

Given that I find in the predictive margins analysis that the effect of diversification on the relation between tax avoidance and risk depends on the level of tax

[15] I repeat this analysis using alternative cut-offs for high versus low diversification, including a consistent cut-off of having avoided tax using at least an average of three of five buckets per year, or 15 (9) buckets over five (three) years. The results are overall similar, providing weak support for my hypotheses.

avoidance, I formally test whether the results I find in Table 5 are dependent on the level of tax avoidance. I partition my sample into thirds based on the *5-Year TaxAvoid* measure and estimate Equation (2) for each of the three groups, representing low, medium, and high levels of tax avoidance. Table 6 presents the results. The coefficient on *Diverse* is negative and statistically significant at the one percent level for the portion of the sample with high levels of tax avoidance. Overall, the effect I find in Table 5 seems to be concentrated among those firms with higher levels of tax avoidance, using the *5-Year TaxAvoid* measure.[16] This provides additional support for my hypotheses, and supports the idea that if a firm is not engaging in much tax avoidance, then diversification does not have an effect.

I next focus on my second measure of risk, and estimate Equation (2) using *FirmRisk* instead of *TaxRisk*, measuring risk as the standard deviation of future monthly stock returns over the subsequent year. Table 7, Panel A presents the results using the continuous *Diverse* measures. While the results using the 5-Year and 3-Year adjusted *TaxAvoid* measures support my hypothesis that diversification reduces firm risk, overall the results are inconsistent. Table 7, Panel B presents the results using the indicator variable *Diverse* measures. I find similar results as Panel A, with weak support for H1(a) using the adjusted *TaxAvoid* measures, but overall inconsistency. Together, both panels of Table 7 provide mixed evidence on the effect of diversification on firm risk as well as on the relation between tax avoidance and overall firm risk. In Table 3, I replicate findings from prior literature that there is no relation between tax avoidance and overall

[16] The results in Table 6 are also similar when I use the *5-Year Adjusted TaxAvoid* measure. Results using the three-year measures are mixed.

firm risk, which is supported by Table 7 as well. Thus, while I do find weak support for the effect of diversification on tax risk, in general I do not find an effect on firm risk.

CHAPTER V

ADDITIONAL ANALYSIS

Measures of Tax Risk

While the volatility of cash ETRs has been widely used in the literature as a proxy for tax risk, other measures may also capture the concept of unexpected tax outcomes. One such measure is tax spikes, as a spike in the cash ETR suggests that prior tax positions may have been overturned. In Figures 1-4 I found descriptive evidence that as diversification increases, the percentage of firms experiencing a tax spike in futures years (3 or 5) decreases. I formalize this test and estimate Equation (2) using *Tax-Spike 3-Year* and *Tax-Spike 5-Year* as my measures of tax risk. *TaxAvoid* is one of the four measures of tax avoidance, *5-Year TaxAvoid* and *5-Year Adjusted TaxAvoid*, as well as the 3-Year measures. *Diverse* is the continuous variables *Diverse_Count25* and *Diverse_Count15*.

Table 8, Panel A presents the results using *Tax-Spike 3-Year* and Panel B presents the results using *Tax-Spike 5-Year*. Though weaker than my main results using the future volatility of cash ETRs as the measure of tax risk, the results in both panels generally follow the findings of Table 5, Panel A. I generally find that tax avoidance increases tax risk and diversification reduces tax risk. The coefficient on the interaction term continues to be negative, suggesting that as a firm moves from low to high levels of tax avoidance, diversification has more of a negative impact on tax risk. Overall, these results weakly support my hypotheses and suggest that tax spikes are an indicator of tax risk.

A second measure that may capture unexpected tax outcomes is the future volatility of GAAP ETRs. The GAAP ETR is affected by the valuation allowance, which is a reserve to offset deferred tax assets for any portion of a tax benefit that more likely

than not will not be realized. The GAAP ETR incorporates what managers expect the tax outcome to be. For a tax outcome to be unexpected ***and*** affect GAAP ETR volatility, it likely affects the GAAP ETR for more than what was reserved for (what was expected). Therefore, the GAAP ETR may represent a better way to measure truly unexpected tax outcomes. Graham, Hanlon, Shevlin, and Shroff (2014) find that 84 percent of publicly traded firms value GAAP ETR at least as much as cash taxes paid, and anecdotal evidence suggests that many managers only care about taxes in so much as with regard to how taxes affect earnings. Thus, I propose the volatility of GAAP ETRs as a second measure of unexpected tax outcomes, capturing tax risk.

Table 9 presents the results. Across all four measures of *TaxAvoid*, the coefficient on *Diverse* is negative, but statistically insignificant. However, I find conflicting results on my other variables of interest *TaxAvoid* and the interaction term between the 5-Year and 3-Year measures. Overall, the results from Table 9 are not significant and provide no support for my hypotheses. Thus, the future volatility of GAAP ETRs may not be an appropriate proxy for tax risk.

Measure of Diversification

One potential issue with my measure of diversification is that I must impose many restrictions on my sample selection process, eliminating approximately 75 percent of the observations used with my GMW Replication sample. To help mitigate this potential issue, I devise a second, alternative measure of diversification based on the number of line items in the ETR reconciliation in the tax footnote that reduce the firm's GAAP ETR. I propose that as the number of reducing line items increases, the more the firm has diversified their tax avoidance strategies. To create this measure, I extract the data tables

for the ETR reconciliation for all available firm-years from directEDGAR, using the ExtractionPreprocessed function. This function has already extracted the ETR reconciliation from the Forms 10-K and has preprocessed all the data into a readable spreadsheet format. Although electronic Forms 10-K are available from fiscal year 1993 to 2017, the directEDGAR team has not included all years or firms in the ExtractionPreprocessed function, and the collection is strongest from 2005 forward. Thus, one limitation of this measure is that the universe of firms represented in this sample may not be representative of all firms and the sample selection process may be biased by ease of data extraction.

Using the extracted data, I count the number of negative line items (line items that reduce the tax rate) in the ETR reconciliation for each firm-year, excluding the first and last observations, which represent that starting point (the statutory rate applied to pretax income) and the ending point (the firm's GAAP tax expense) and not reconciling items. To help mitigate concerns that this measure captures the firm's disclosure policies rather than the diversification of tax strategies, I only count negative line items that reduce the tax rate by at least five percent. I sum each negative count over five and three years to represent how many strategies were used over a five and three year period, respectively. This variable, *Negative_Count5* (*Negative_Count3*) is a continuous measure increasing in diversification.

I estimate Equation (2) where *TaxRisk* represents the standard deviation of future cash ETR over five years and *TaxAvoid* is one of the four measures of tax avoidance, *5-Year TaxAvoid* and *5-Year Adjusted TaxAvoid*, as well as the 3-Year measures. *Diverse* represents either of my two alternative measures of diversification, *Negative_Count5* and

Negative_Count3. Because the creation of this new diversification measure does not require as extreme sample restrictions as my main measure, I estimate Equation (2) over the GMW Replication sample, with one additional restriction from my Diversification sample that the firm be an overall tax avoider. Table 10 presents the results. Overall, across three of the four measures of *TaxAvoid*, the coefficient on *TaxAvoid* is positive and significant, suggesting that tax avoidance increases tax risk. In addition, the coefficient on *Diverse* is negative and significant across three of the founr measures of *TaxAvoid*, suggesting that diversification reduces tax risk, consistent with my first hypothesis. However, the coefficients on the interaction term are mixed and statistically insignificant, offering no support for my second hypothesis. One issue to note with this measure, however, is that although I start with a much larger sample than my Diversification sample, due to the poor data population in the directEDGAR Extraction Preprocessed tables, my final sample is even smaller than my Diversification sample with only 3,610 (5,086) observations using the 5-Year (3-Year) measure. Additional hand-collection of data is required to increase the sample size.

CHAPTER VI

CONCLUSION

Consistent with the idea that tax avoidance is risky, the practitioner literature has focused on the importance of tax risk management. However, empirically, prior studies have generally failed to find a relation between measures of overall firm risk and measures of corporate tax avoidance. I propose that one possible reason is that prior researchers have failed to consider the role that diversification plays in reducing the risk of a portfolio of tax strategies, and thereby reducing overall firm risk. Thus, in this paper, I investigate the effect that the number of different tax strategies employed by a public company has on the relation between measures of corporate tax avoidance and measures of overall firm risk. I develop a measure of the diversification of sources of tax benefits, as a proxy for the underlying tax strategies, based on broad categories of book-tax differences, and divide my sample into firms with high and low levels of diversification. I test my hypotheses by regressing risk on tax avoidance, diversification, and an interaction term. When using the standard deviation of future cash ETRs as a measure of tax risk, I find weak support that diversification reduces tax risk and mitigates a positive relation between tax avoidance and tax risk. I find mixed results when using the standard deviation of future monthly stock returns as a measure of overall firm risk. Taken together, I contribute to the literature on tax avoidance and tax risk, and add a new dimension, diversification, to our thinking of how these two concepts are related.

APPENDIX A

VARIABLE DEFINITIONS

Diversification Variables

Diverse_Dummy	An indicator variable equal to one if the firm has a high level of diversification over 5(3) years, using *Diverse_Count25* (*Diverse_Count15*), and zero otherwise.
Diverse_Count25	A variable ranging from 1 to 25, counting in how many buckets the firm avoided taxes over 5 years (*t-4* to *t*).
Diverse_Count15	A variable ranging from 1 to 15, counting in how many buckets the firm avoided taxes over 3 years (*t-2* to *t*).
Negative_Count5	A variable counting the number of negative (tax reducing) line items present in the ETR reconciliation each year, over 5 years (*t-4* to *t*).
Negative_Count3	A variable counting the number of negative (tax reducing) line items present in the ETR reconciliation each year, over 3 years (*t-2* to *t*).

Tax Avoidance Variables

5-Year TaxAvoid	The five-year sum (from year *t-4* to year *t*) of cash taxes paid (TXPD) divided by the five-year sum of pretax income (PI) less special items (SPI), winsorized at 0 and 1. Firms are required to have a positive denominator. Multiplied by negative one to be increasing in tax avoidance.
3-Year TaxAvoid	The three-year sum (from year *t-2* to year *t*) of cash taxes paid (TXPD) divided by the three-year sum of pretax income (PI) less special items (SPI), winsorized at 0 and 1. Firms are required to have a positive denominator. Multiplied by negative one to be increasing in tax avoidance.
5-Year Adjusted TaxAvoid	The five-year sum (from year *t-4* to year *t*) of cash taxes paid (TXPD) divided by the five-year sum of pretax income (PI) less special items (SPI), subtracted from the same period five-year cash ETR for the portfolio of firms in the same quintile of total assets and the same industry, to be increasing in tax avoidance.

3-Year Adjusted TaxAvoid	The three-year sum (from year *t-2* to year *t*) of cash taxes paid (TXPD) divided by the three-year sum of pretax income (PI) less special items (SPI), subtracted from the same period three-year cash ETR for the portfolio of firms in the same quintile of total assets and the same industry, to be increasing in tax avoidance.

Risk Variables

FirmRisk (SD_Ret)	The standard deviation of monthly stock returns over the next year (*t+1*).
TaxRisk (SD_CETR)	The standard deviation of cash taxes paid (TXPD) divided by the sum of pretax income (PI) less special items (SPI), winsorized at 0 and 1, from *t+1* to *t+5*.
TaxRisk (SD_GAAPETR)	The standard deviation of income tax expense (TXT) divided by the sum of pretax income (PI) less special items (SPI), winsorized at 0 and 1, from *t+1* to *t+5*.
TaxRisk (Tax-Spike 5-Year)	Adapted from Saavedra (2018), an indicator variable equal to 1 if a firm has a cash tax payment (TXPD) equal to at least 60 percent of pretax income (PI) less special items (SPI) in any of the future five years, and zero otherwise.
TaxRisk (Tax-Spike 3-Year)	Adapted from Saavedra (2018), an indicator variable equal to 1 if a firm has a cash tax payment (TXPD) equal to at least 60 percent of pretax income (PI) less special items (SPI) in any of the future three years, and zero otherwise.

Control Variables

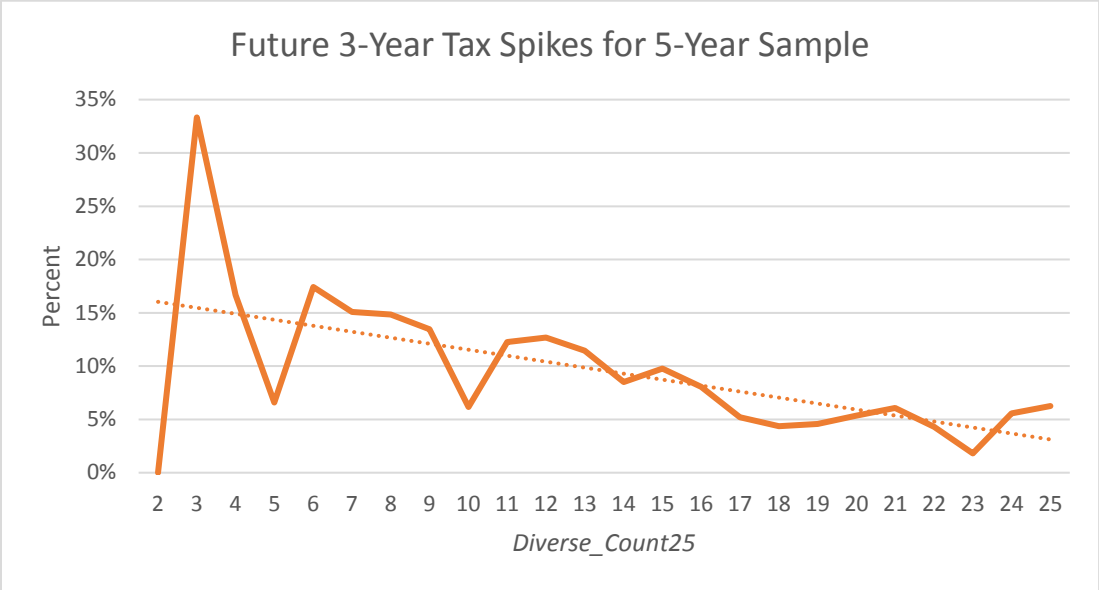
PTBI	Pretax Income (PI) scaled by prior-period Total Assets (AT).
Vol_PTBI	The standard deviation of Pretax Income (PI) scaled by prior-period Total Assets (AT) from *t-4* to *t*.
BTM	Book value of equity (CEQ) over price per share (PRCC_F) times total common shares outstanding (CSHO).
Leverage	Long-Term Debt (DLTT) scaled by prior-period total Assets (AT).
Size	The natural log of total assets (AT).

Shares_Out	The log of the firm's common shares outstanding (CSHO).
Vol_SpecialItems	The standard deviation of special items (SPI) scaled by prior-period total assets (AT) from *t-4* to *t*.
Vol_CashFlow	The standard deviation of cash flow (OANCF) scaled by prior-period total Assets (AT) from *t-4* to *t*.
Vol_ETBSO	The standard deviation of excess tax benefit of stock options (TXBCOF + TXBCO) scaled by prior-period total assets (AT) from *t-4* to *t*. Set to 0 if missing.
ETBSO	The excess tax benefit of stock options (TXBCOF + TXBCO) scaled by prior-period total assets (AT). Set to 0 if missing.
CHG_NOLCF	Current year net operating loss carryforward (TLCF) less prior year scaled by prior-period total assets (AT). Set to 0 if missing (TLCF).
NOLCF	Net operating loss carryforward (TLCF) scaled by prior-period total assets (AT).Set equal to 0 if missing (TLCF).
Loss	An indicator variable equal to one if a firm has negative pretax income, zero otherwise.

APPENDIX B

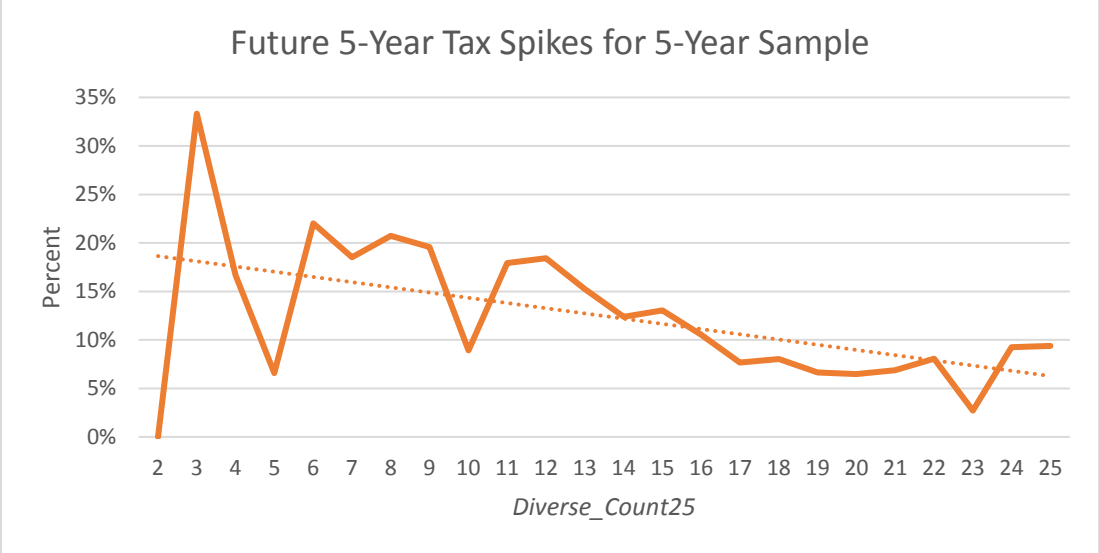
FIGURES

FIGURE 1



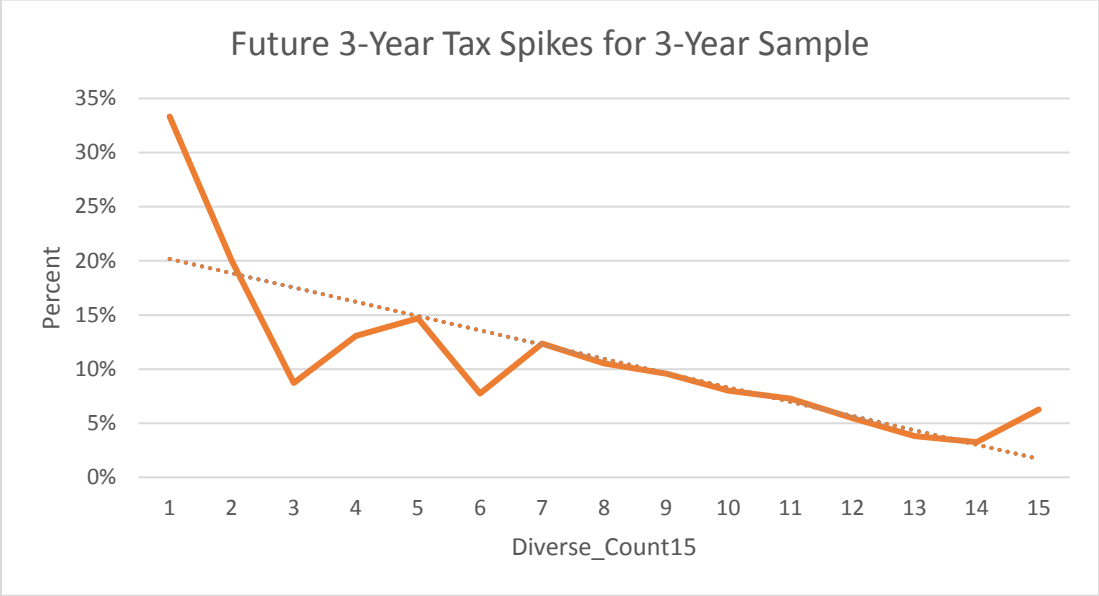
Note: This figure presents the percentage of firms in the 5-year sample with a tax spike in any of the future 3 years for each level of diversification.

FIGURE 2



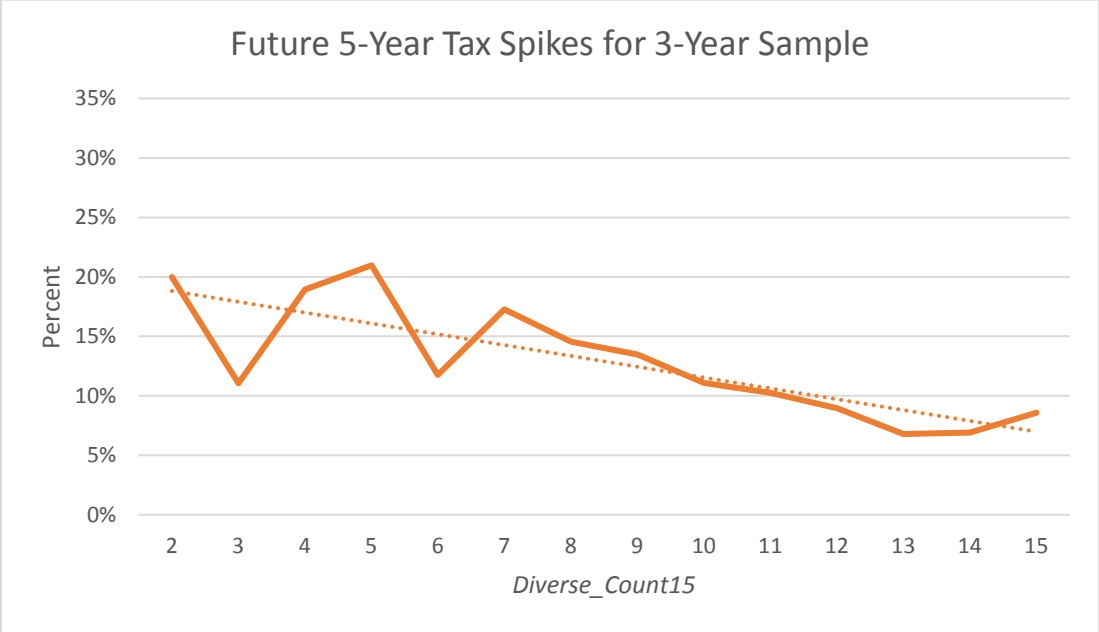
Note: This figure presents the percentage of firms in the 5-year sample with a tax spike in any of the future 5 years for each level of diversification.

FIGURE 3



Note: This figure presents the percentage of firms in the 3-year sample with a tax spike in any of the future 3 years for each level of diversification.

FIGURE 4



Note: This figure presents the percentage of firms in the 3-year sample with a tax spike in any of the future 5 years for each level of diversification.

APPENDIX C
TABLES

TABLE 1
Sample Selection

	5-Year	3-Year
All Compustat firms (1987–2017) incorporated in the U.S.	274,827	274,827
Insufficient Data to Calculate:		
Stock Return Volatility	(115,629)	(115,629)
Control Variables	(85,460)	(85,460)
Tax Variable (post-FAS 109)	(31,215)	(26,643)
GMW Replication Sample	42,523	47,095
Insufficient Data to Calculate Diversification Buckets:		
Negative Pretax Income	(12,894)	(9,671)
Current and Deferred Taxes	(13,413)	(14,914)
Pretax Domestic and Foreign Income	(2,841)	(3,328)
Overall Not Avoiding Tax	(1,516)	(2,595)
Diversification Sample - Firm Risk	11,859	16,587
Insufficient Data to Calculate Future Cash ETR Volatility	(4,736)	(6,636)
Diversification Sample - Tax Risk	7,123	9,951

TABLE 2
Descriptive Statistics

Panel A: GMW Replication Sample

Variable	n	Mean	Std. Dev.	25th Percentile	50th Percentile	75th Percentile
5-Year TaxAvoid	42,523	-0.2703	0.1976	-0.3490	-0.2609	-0.1449
3-Year TaxAvoid	47,095	-0.2603	0.2022	-0.3480	-0.2507	-0.1181
5-Year Adjusted TaxAvoid	42,523	-0.0205	0.1750	-0.0699	0.0000	0.0668
3-Year Adjusted TaxAvoid	47,095	-0.0217	0.1811	-0.0772	0.0000	0.0725
FirmRisk (SD_Ret)	49,121	0.1139	0.0677	0.0666	0.0968	0.1417
TaxRisk (SD_CETR)	29,469	0.1358	0.1187	0.0500	0.0973	0.1836
TaxRisk (SD_GAAPETR)	30,490	0.1183	0.1188	0.0266	0.0773	0.1674
TaxRisk (Tax-Spike 5-Year)	49,121	0.1620	0.3685	0.0000	0.0000	0.0000
TaxRisk (Tax-Spike 3-Year)	49,121	0.1175	0.3220	0.0000	0.0000	0.0000
PTBI	49,121	0.0813	0.1106	0.0169	0.0647	0.1308
Vol_PTBI	49,121	0.0699	0.0811	0.0201	0.0438	0.0869
BTM	49,121	0.6605	0.5215	0.3222	0.5378	0.8408
Leverage	49,121	0.2093	0.2235	0.0150	0.1497	0.3248
Size	49,121	6.5993	1.9790	5.2223	6.5936	7.9066
Shares_Out	49,121	3.4434	1.4309	2.4371	3.3798	4.3249
Vol_SpecialItems	49,121	0.0240	0.0398	0.0018	0.0088	0.0271
Vol_CashFlow	49,121	0.0609	0.0632	0.0217	0.0424	0.0766
Vol_ETBSO	49,121	0.0006	0.0021	0.0000	0.0000	0.0000
ETBSO	49,121	0.0004	0.0018	0.0000	0.0000	0.0000
CHG_NOLCF	49,121	0.0017	0.0391	0.0000	0.0000	0.0000
LOSS	49,121	0.1409	0.3480	0.0000	0.0000	0.0000

Note: This table presents the descriptive statistics for the full GMW diversification sample, including observations only present in either the 5-year or 3-year sample. All variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99% levels.

TABLE 2
Descriptive Statistics

Panel B: Diversification Sample

Variable	n	Mean	Std. Dev.	25th Percentile	50th Percentile	75th Percentile
5-Year TaxAvoid	11,859	-0.2216	0.1270	-0.3157	-0.2429	-0.1369
3-Year TaxAvoid	16,587	-0.2120	0.1371	-0.3111	-0.2280	-0.1020
5-Year Adjusted TaxAvoid	11,859	0.0074	0.1013	-0.0396	0.0000	0.0515
3-Year Adjusted TaxAvoid	16,587	0.0097	0.1164	-0.0427	0.0000	0.0648
FirmRisk (SD_Ret)	17,072	0.0992	0.0546	0.0612	0.0859	0.1219
TaxRisk (SD_CETR)	10,242	0.1207	0.1123	0.0433	0.0842	0.1597
TaxRisk (SD_GAAPETR)	10,626	0.0969	0.1094	0.0177	0.0537	0.1415
TaxRisk (Tax-Spike 5-Year)	17,072	0.1394	0.3463	0.0000	0.0000	0.0000
TaxRisk (Tax-Spike 3-Year)	17,072	0.0976	0.2968	0.0000	0.0000	0.0000
PTBI	17,072	0.1204	0.0969	0.0520	0.0958	0.1605
Vol_PTBI	17,072	0.0564	0.0682	0.0188	0.0358	0.0663
BTM	17,072	0.5385	0.4058	0.2742	0.4482	0.6944
Leverage	17,072	0.2212	0.2276	0.0120	0.1703	0.3417
Size	17,072	6.8229	1.9539	5.5312	6.8470	8.1264
Shares_Out	17,072	3.6522	1.4470	2.6610	3.5937	4.5348
Vol_SpecialItems	17,072	0.0159	0.0297	0.0015	0.0065	0.0170
Vol_CashFlow	17,072	0.0552	0.0570	0.0212	0.0386	0.0680
Vol_ETBSO	17,072	0.0009	0.0025	0.0000	0.0000	0.0000
ETBSO	17,072	0.0007	0.0023	0.0000	0.0000	0.0000
CHG_NOLCF	17,072	-0.0004	0.0313	0.0000	0.0000	0.0000

Note: This table presents the descriptive statistics for the full diversification sample, including observations only present in either the 5-year or 3-year sample. All variables are defined in Appendix A. All continuous variables are winsorized at the 1% and 99% levels.

TABLE 2
Descriptive Statistics

Panel C: Industry Composition

Fama-French Industry Code		GMW Replication Sample		Diversification Sample	
		n	Percent	n	Percent
1	Agriculture	151	0.31	66	0.39
2	Food Products	966	1.97	393	2.3
3	Candy & Soda	123	0.25	71	0.42
4	Beer & Liquor	170	0.35	96	0.56
5	Tobacco Products	53	0.11	39	0.23
6	Recreation	363	0.74	121	0.71
7	Entertainment	630	1.28	178	1.04
8	Printing and Publishing	362	0.74	141	0.82
9	Consumer Goods	824	1.68	297	1.74
10	Apparel	798	1.62	254	1.49
11	Healthcare	830	1.69	359	2.1
12	Medical Equipment	1,364	2.78	489	2.87
13	Pharmaceutical Products	1,229	2.5	407	2.38
14	Chemicals	1,065	2.17	429	2.51
15	Rubber and Plastic Products	451	0.92	148	0.87
16	Textiles	201	0.41	72	0.42
17	Construction Materials	1,060	2.16	423	2.48
18	Construction	627	1.28	223	1.31
19	Steel Works	630	1.28	202	1.18
20	Fabricated Products	168	0.34	36	0.21
21	Machinery	1,798	3.66	702	4.11
22	Electrical Equipment	735	1.5	191	1.12
23	Automobiles and Trucks	791	1.61	294	1.72
24	Aircraft	270	0.55	144	0.84
25	Shipbuilding, Railroad Equipment	130	0.26	46	0.27
26	Defense	135	0.27	71	0.42
27	Precious Metals	53	0.11	6	0.04
28	Non-Metallic & Industrial Metal Mining	149	0.3	53	0.31
29	Coal	79	0.16	43	0.25
30	Petroleum and Natural Gas	1,427	2.91	408	2.39
31	Utilities	2,097	4.27	216	1.27
32	Communication	986	2.01	366	2.14
33	Personal Services	576	1.17	258	1.51
34	Business Services	2,559	5.21	866	5.07
35	Computer Hardware	879	1.79	284	1.66
36	Computer Software	2,738	5.57	983	5.76
37	Electronic Equipment	2,712	5.52	895	5.24
38	Measuring and Control Equipment	1,104	2.25	403	2.36
39	Business Supplies	652	1.33	262	1.53
40	Shipping Containers	203	0.41	88	0.52
41	Transportation	1,229	2.5	608	3.56
42	Wholesale	1,950	3.97	761	4.46
43	Retail	2,756	5.61	1,157	6.78
44	Restaurants, Hotels, Motels	955	1.94	302	1.77
45	Banking	3,593	7.31	259	1.52

TABLE 2, Panel C (continued)

Fama-French Industry Code		GMW Replication Sample		Diversification Sample	
		n	Percent	n	Percent
46	Insurance	1,816	3.7	660	3.87
47	Real Estate	344	0.7	104	0.61
48	Trading	3,497	7.12	1,946	11.4
49	Other	843	1.72	252	1.48
	Total	49,121	100	17,072	100

Note: This table presents the industry composition for the full diversification sample and GMW replication sample, including observations in only present either the 5-year or 3-year sample. Industry composition is based on Fama-French 49 groupings.

TABLE 3
The Relation between Tax Avoidance and Measures of Risk

	GMW Replication Sample - Firm Risk (SD_Ret)		Diversification Sample - Firm Risk (SD_Ret)		Diversification Sample - Tax Risk (SD_CETR)	
	(1) *5-Year TaxAvoid*	*(2)* *3-Year Adjusted TaxAvoid*	*(3)* *5-Year TaxAvoid*	*(4)* *3-Year Adjusted TaxAvoid*	*(5)* *5-Year TaxAvoid*	*(6)* *3-Year Adjusted TaxAvoid*
TaxAvoid	-0.0037	-0.0003	0.0095	0.0079	0.0575	0.0272
	(-1.46)	(-0.15)	(1.09)	(1.57)	(1.59)	(1.64)
PTBI	0.0013	0.0041	0.0197**	0.0239***	-0.0192	-0.0002
	(0.24)	(0.82)	(2.02)	(2.90)	(-0.76)	(-0.01)
Vol_PTBI	0.0734***	0.0609***	0.0920***	0.0433**	-0.0313	-0.0475
	(6.26)	(5.79)	(3.49)	(2.40)	(-0.55)	(-1.07)
BTM	0.0195***	0.0189***	0.0127***	0.0146***	-0.0047	-0.0062
	(14.48)	(14.14)	(4.06)	(5.70)	(-0.58)	(-0.93)
Leverage	0.0245***	0.0235***	0.0203***	0.0188***	0.0185	-0.0036
	(9.61)	(10.15)	(4.69)	(5.26)	(1.60)	(-0.35)
Size	-0.0060***	-0.0061***	-0.0029	-0.0038**	0.0130*	0.0160***
	(-4.84)	(-5.39)	(-1.36)	(-2.34)	(1.73)	(2.82)
Shares_Out	0.0003	0.0004	0.0035*	0.0022	0.0111	0.0085
	(0.22)	(0.40)	(1.76)	(1.39)	(1.56)	(1.39)
Vol_SpecialItems	0.0319*	0.0247	-0.0042	-0.0027	0.0335	-0.0221
	(1.81)	(1.53)	(-0.10)	(-0.10)	(0.20)	(-0.29)
Vol_CashFlow	0.0090	0.0190*	-0.0010	0.0321*	-0.0809	-0.0892
	(0.73)	(1.76)	(-0.04)	(1.81)	(-1.19)	(-1.64)

TABLE 3 (continued)

	GMW Replication Sample - Firm Risk (SD_Ret)		Diversification Sample - Firm Risk (SD_Ret)		Diversification Sample - Tax Risk (SD_CETR)	
	(1) *5-Year TaxAvoid*	*(2)* *3-Year Adjusted TaxAvoid*	*(3)* *5-Year TaxAvoid*	*(4)* *3-Year Adjusted TaxAvoid*	*(5)* *5-Year TaxAvoid*	*(6)* *3-Year Adjusted TaxAvoid*
Vol_ETBSO	-1.4570***	-1.4875***	-1.4273***	-1.1705***	-0.4891	-0.3933
	(-6.82)	(-6.82)	(-4.64)	(-4.14)	(-0.57)	(-0.50)
ETBSO	0.3107*	0.2577	-0.2341	-0.3499	-0.6603	-0.6730
	(1.95)	(1.63)	(-1.00)	(-1.63)	(-1.27)	(-1.28)
CHG_NOLCF	0.0319***	0.0149*	0.0130	0.0009	-0.1151**	-0.0758**
	(3.78)	(1.87)	(0.72)	(0.06)	(-2.26)	(-1.96)
NOLCF	-0.0072*	-0.0038	0.0128	0.0132**	0.0355	0.0034
	(-1.65)	(-0.98)	(1.37)	(2.08)	(1.06)	(0.14)
Loss	0.0205***	0.0202***	0.0000	0.0000	0.0000	0.0000
	(16.26)	(16.46)	(.)	(.)	(.)	(.)
Constant	0.1387***	0.1160***	0.1073***	0.0911***	0.0129	0.0005
	(20.64)	(19.74)	(8.67)	(10.51)	(0.31)	(0.02)
N	42,523	47,095	11,859	16,587	7,123	9,951
Adj. R-sq	0.2734	0.2637	0.2480	0.2472	0.0236	0.0245

Note: This table presents the results from estimating Equation (1). I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 4
Diversification Descriptives

Panel A: 5-Year Measure

Diverse_Count25	n	Percent	Cum.
2	1	0.01	0.01
3	3	0.03	0.03
4	12	0.10	0.13
5	152	1.28	1.42
6	109	0.92	2.34
7	232	1.96	4.29
8	390	3.29	7.58
9	574	4.84	12.42
10	2,100	17.71	30.13
11	1,025	8.64	38.77
12	1,196	10.09	48.86
13	1,205	10.16	59.02
14	1,091	9.20	68.22
15	920	7.76	75.98
16	484	4.08	80.06
17	481	4.06	84.11
18	461	3.89	88.00
19	437	3.68	91.69
20	357	3.01	94.70
21	247	2.08	96.78
22	186	1.57	98.35
23	110	0.93	99.27
24	54	0.46	99.73
25	32	0.27	100.00
Total	11,860	100	
Average	13.18		

Note: This table presents the number of observations at each level of diversification using the 5-year measure. There are no observations for level 1.

TABLE 4
Diversification Descriptives

Panel B: 3-Year Measure

Diverse_Count15	n	Percent	Cum.
1	6	0.04	0.04
2	30	0.18	0.22
3	344	2.07	2.29
4	528	3.18	5.47
5	1,071	6.46	11.93
6	3,653	22.02	33.95
7	2,486	14.99	48.94
8	2,555	15.40	64.35
9	2,252	13.58	77.92
10	1,074	6.47	84.40
11	936	5.64	90.04
12	807	4.87	94.91
13	471	2.84	97.75
14	246	1.48	99.23
15	128	0.77	100.00
Total	16,587	100	
Average	7.89		

Note: This table presents the number of observations at each level of diversification using the 3-year measure.

TABLE 5
The Impact of Diversification on the Relation between Tax Avoidance and Tax Risk

Panel A: Continuous Measures of Diversification

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.2307**	0.1493**	0.0878	0.0929*
	(2.20)	(1.97)	(1.60)	(1.92)
Diverse	-0.0054**	-0.0021**	-0.0035**	-0.0011
	(-2.55)	(-2.21)	(-1.97)	(-1.08)
Diverse x TaxAvoid	-0.0124*	-0.0079	-0.0105*	-0.0084
	(-1.75)	(-1.50)	(-1.68)	(-1.51)
PTBI	-0.0163	-0.0158	0.0016	0.0016
	(-0.65)	(-0.63)	(0.08)	(0.08)
Vol_PTBI	-0.0251	-0.0312	-0.0476	-0.0489
	(-0.44)	(-0.54)	(-1.08)	(-1.10)
BTM	-0.0043	-0.0044	-0.0061	-0.0062
	(-0.54)	(-0.54)	(-0.92)	(-0.93)
Leverage	0.0176	0.0171	-0.0025	-0.0034
	(1.51)	(1.46)	(-0.24)	(-0.34)
Size	0.0146*	0.0149**	0.0161***	0.0164***
	(1.96)	(2.00)	(2.87)	(2.89)
Shares_Out	0.0107	0.0103	0.0086	0.0084
	(1.52)	(1.46)	(1.42)	(1.39)
Vol_SpecialItems	-0.0056	-0.0019	-0.0266	-0.0238
	(-0.03)	(-0.01)	(-0.35)	(-0.32)
Vol_CashFlow	-0.0849	-0.0829	-0.0881	-0.0898*
	(-1.26)	(-1.23)	(-1.62)	(-1.65)
Vol_ETBSO	-0.3946	-0.3337	-0.4235	-0.3745
	(-0.45)	(-0.38)	(-0.54)	(-0.48)
ETBSO	-0.6519	-0.6370	-0.6230	-0.6456
	(-1.25)	(-1.22)	(-1.18)	(-1.23)
CHG_NOLCF	-0.1010**	-0.1086**	-0.0775**	-0.0740*
	(-2.00)	(-2.15)	(-1.99)	(-1.91)
NOLCF	0.0316	0.0355	0.0030	0.0015
	(0.95)	(1.08)	(0.12)	(0.06)

TABLE 5, Panel A (continued)

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	0.0746	0.0131	0.0276	0.0063
	(1.42)	(0.32)	(0.85)	(0.22)
N	7,123	7,123	9,951	9,951
Adj. R-sq	0.0286	0.0270	0.0247	0.0254

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 5
The Impact of Diversification on the Relation between Tax Avoidance and Tax Risk

Panel B: Indicator Variable Measures of Diversification

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.0640*	0.0499*	0.0195	0.0380*
	(1.72)	(1.75)	(0.87)	(1.95)
Diverse	-0.0247	-0.0139**	-0.0140*	-0.0042
	(-1.59)	(-2.38)	(-1.96)	(-1.22)
Diverse x TaxAvoid	-0.0433	-0.0557	-0.0419*	-0.0310
	(-0.73)	(-1.21)	(-1.65)	(-1.27)
PTBI	-0.0180	-0.0175	0.0015	0.0014
	(-0.71)	(-0.69)	(0.07)	(0.07)
Vol_PTBI	-0.0308	-0.0321	-0.0480	-0.0481
	(-0.54)	(-0.56)	(-1.09)	(-1.08)
BTM	-0.0046	-0.0044	-0.0061	-0.0062
	(-0.57)	(-0.55)	(-0.93)	(-0.93)
Leverage	0.0189	0.0183	-0.0028	-0.0035
	(1.64)	(1.58)	(-0.28)	(-0.34)
Size	0.0135*	0.0138*	0.0160***	0.0162***
	(1.80)	(1.84)	(2.84)	(2.87)
Shares_Out	0.0110	0.0107	0.0088	0.0086
	(1.55)	(1.51)	(1.44)	(1.41)
Vol_SpecialItems	0.0154	0.0111	-0.0246	-0.0224
	(0.09)	(0.07)	(-0.32)	(-0.30)
Vol_CashFlow	-0.0786	-0.0792	-0.0857	-0.0882
	(-1.16)	(-1.18)	(-1.57)	(-1.61)
Vol_ETBSO	-0.4625	-0.4332	-0.4037	-0.3590
	(-0.54)	(-0.50)	(-0.51)	(-0.46)
ETBSO	-0.6203	-0.5926	-0.6558	-0.6698
	(-1.19)	(-1.14)	(-1.24)	(-1.27)
CHG_NOLCF	-0.1111**	-0.1153**	-0.0768**	-0.0734*
	(-2.19)	(-2.28)	(-1.98)	(-1.90)
NOLCF	0.0364	0.0394	0.0038	0.0022
	(1.10)	(1.20)	(0.15)	(0.09)

TABLE 5, Panel B (continued)

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	0.0121	-0.0058	0.0053	-0.0003
	(0.29)	(-0.15)	(0.18)	(-0.01)
N	7,123	7,123	9,951	9,951
Adj. R-sq	0.0258	0.0255	0.0244	0.0251

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 6
The Impact of Diversification on the Relation between Levels of Tax Avoidance and Tax Risk

	Tax Risk (SD_CETR)		
	5-Year TaxAvoid Low	*5-Year TaxAvoid Medium*	*5-Year TaxAvoid High*
TaxAvoid	-0.1240	0.3843	0.5230
	(-0.38)	(1.34)	(1.53)
Diverse	0.0095	-0.0050	-0.0089***
	(1.08)	(-1.04)	(-2.59)
Diverse x TaxAvoid	0.0342	-0.0246	-0.0348
	(1.34)	(-1.42)	(-1.59)
PTBI	-0.0310	-0.0137	0.0692
	(-0.79)	(-0.32)	(1.55)
Vol_PTBI	-0.0495	-0.0590	0.0544
	(-0.52)	(-0.56)	(0.55)
BTM	0.0097	-0.0088	-0.0030
	(0.56)	(-0.73)	(-0.30)
Leverage	0.0270	0.0420**	-0.0200
	(1.16)	(1.97)	(-1.21)
Size	0.0055	0.0152	0.0144
	(0.36)	(1.19)	(1.35)
Shares_Out	0.0206**	-0.0103	0.0025
	(2.00)	(-0.91)	(0.24)
Vol_SpecialItems	0.0766	-0.0800	0.1554
	(0.42)	(-0.19)	(0.43)
Vol_CashFlow	0.0268	-0.2253	-0.1741
	(0.22)	(-1.61)	(-1.55)
Vol_ETBSO	-1.9807	0.1325	2.4743
	(-1.14)	(0.14)	(1.44)
ETBSO	-1.5492	-0.0800	-1.0973
	(-1.30)	(-0.11)	(-1.25)
CHG_NOLCF	-0.4482***	0.0109	-0.0681
	(-2.60)	(0.11)	(-1.05)
NOLCF	0.2145**	-0.0629	0.0072
	(2.02)	(-0.81)	(0.22)

TABLE 6 (continued)

	Tax Risk (SD_CETR)		
	5-Year TaxAvoid Low	*5-Year TaxAvoid Medium*	*5-Year TaxAvoid High*
Constant	0.0056	0.1654	0.0868
	(0.04)	(1.35)	(1.32)
N	2,374	2,374	2,375
Adj. R-sq	0.0845	0.0322	0.0372

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 7
The Impact of Diversification on the Relation between Tax Avoidance and Firm Risk

Panel A: Continuous Measures of Diversification

	Firm Risk (SD_Ret)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	-0.0200	0.0099	-0.0346**	-0.0255
	(-0.72)	(0.41)	(-2.18)	(-1.56)
Diverse	0.0001	-0.0006***	0.0004	-0.0008***
	(0.09)	(-2.71)	(0.78)	(-3.07)
Diverse x TaxAvoid	0.0025	0.0012	0.0049***	0.0047**
	(1.36)	(0.72)	(2.66)	(2.45)
PTBI	0.0210**	0.0213**	0.0251***	0.0256***
	(2.15)	(2.19)	(3.03)	(3.10)
Vol_PTBI	0.0916***	0.0919***	0.0431**	0.0429**
	(3.48)	(3.51)	(2.39)	(2.38)
BTM	0.0128***	0.0129***	0.0144***	0.0146***
	(4.08)	(4.13)	(5.64)	(5.73)
Leverage	0.0201***	0.0196***	0.0189***	0.0188***
	(4.67)	(4.57)	(5.30)	(5.28)
Size	-0.0025	-0.0023	-0.0035**	-0.0035**
	(-1.15)	(-1.06)	(-2.20)	(-2.16)
Shares_Out	0.0033*	0.0032*	0.0022	0.0022
	(1.70)	(1.66)	(1.39)	(1.39)
Vol_SpecialItems	-0.0086	-0.0071	-0.0041	-0.0035
	(-0.20)	(-0.17)	(-0.15)	(-0.13)
Vol_CashFlow	-0.0012	-0.0024	0.0320*	0.0314*
	(-0.05)	(-0.10)	(1.80)	(1.77)
Vol_ETBSO	-1.4160***	-1.3919***	-1.1717***	-1.1759***
	(-4.63)	(-4.53)	(-4.18)	(-4.19)
ETBSO	-0.2414	-0.2225	-0.3543*	-0.3388
	(-1.04)	(-0.96)	(-1.65)	(-1.57)
CHG_NOLCF	0.0133	0.0159	-0.0008	0.0009
	(0.74)	(0.89)	(-0.05)	(0.06)
NOLCF	0.0117	0.0113	0.0135**	0.0128**
	(1.27)	(1.23)	(2.12)	(2.03)

TABLE 7, Panel A (continued)

	Firm Risk (SD_Ret)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	0.1047***	0.1089***	0.0872***	0.0950***
	(7.61)	(8.79)	(9.19)	(10.84)
N	11,859	11,859	16,587	16,587
Adj. R-sq	0.2487	0.2498	0.2480	0.2483

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 7
The Impact of Diversification on the Relation between Tax Avoidance and Firm Risk

Panel B: Indicator Variable Measures of Diversification

	Firm Risk (SD_Ret)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.0089	0.0226***	-0.0037	0.0038
	(0.99)	(2.94)	(-0.61)	(0.64)
Diverse	0.0005	-0.0033**	0.0016	-0.0025**
	(0.14)	(-2.05)	(0.76)	(-2.35)
Diverse x TaxAvoid	0.0154	0.0111	0.0165**	0.0177**
	(1.02)	(0.80)	(2.10)	(2.11)
PTBI	0.0203**	0.0206**	0.0241***	0.0246***
	(2.08)	(2.12)	(2.91)	(2.97)
Vol_PTBI	0.0917***	0.0916***	0.0436**	0.0432**
	(3.48)	(3.49)	(2.41)	(2.39)
BTM	0.0127***	0.0128***	0.0144***	0.0146***
	(4.06)	(4.10)	(5.65)	(5.73)
Leverage	0.0204***	0.0199***	0.0191***	0.0188***
	(4.72)	(4.64)	(5.35)	(5.31)
Size	-0.0029	-0.0027	-0.0037**	-0.0036**
	(-1.34)	(-1.25)	(-2.30)	(-2.26)
Shares_Out	0.0034*	0.0033*	0.0022	0.0022
	(1.75)	(1.70)	(1.39)	(1.38)
Vol_SpecialItems	-0.0072	-0.0039	-0.0036	-0.0030
	(-0.17)	(-0.09)	(-0.13)	(-0.11)
Vol_CashFlow	-0.0010	-0.0019	0.0320*	0.0318*
	(-0.04)	(-0.08)	(1.80)	(1.79)
Vol_ETBSO	-1.4272***	-1.4012***	-1.1802***	-1.1858***
	(-4.64)	(-4.56)	(-4.21)	(-4.22)
ETBSO	-0.2284	-0.2182	-0.3521	-0.3444
	(-0.98)	(-0.94)	(-1.64)	(-1.60)
CHG_NOLCF	0.0132	0.0156	-0.0009	0.0008
	(0.73)	(0.87)	(-0.06)	(0.05)
NOLCF	0.0125	0.0122	0.0138**	0.0131**
	(1.34)	(1.30)	(2.16)	(2.07)

TABLE 7, Panel B (continued)

	Firm Risk (SD_Ret)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	0.1071***	0.1037***	0.0906***	0.0908***
	(8.65)	(8.41)	(10.50)	(10.50)
N	11,859	11,859	16,587	16,587
Adj. R-sq	0.2482	0.2493	0.2475	0.2478

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 8
The Impact of Diversification on the Relation between Tax Avoidance and Tax Risk (Tax Spikes)

Panel A: 3-Year Measure

	Tax Risk (Tax-Spike 3-Year)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.6077**	0.3212	0.3596**	0.3216**
	(2.26)	(1.64)	(2.51)	(2.52)
Diverse	-0.0109**	-0.0036	-0.0099**	-0.0006
	(-2.18)	(-1.58)	(-2.27)	(-0.24)
Diverse x TaxAvoid	-0.0282	-0.0082	-0.0397**	-0.0292*
	(-1.55)	(-0.60)	(-2.38)	(-1.95)
PTBI	-0.0773	-0.0763	-0.0467	-0.0465
	(-1.05)	(-1.05)	(-0.82)	(-0.81)
Vol_PTBI	-0.0907	-0.1048	-0.1690	-0.1706
	(-0.58)	(-0.67)	(-1.51)	(-1.52)
BTM	-0.0151	-0.0145	-0.0030	-0.0032
	(-0.74)	(-0.71)	(-0.19)	(-0.20)
Leverage	0.0530*	0.0502*	0.0284	0.0261
	(1.86)	(1.76)	(1.15)	(1.06)
Size	0.0422**	0.0436**	0.0371***	0.0384***
	(2.42)	(2.49)	(2.92)	(3.01)
Shares_Out	0.0109	0.0103	0.0003	-0.0004
	(0.61)	(0.58)	(0.03)	(-0.03)
Vol_SpecialItems	0.4884	0.5081	0.0263	0.0306
	(1.31)	(1.36)	(0.16)	(0.18)
Vol_CashFlow	-0.0720	-0.0622	-0.0264	-0.0266
	(-0.41)	(-0.35)	(-0.19)	(-0.19)
Vol_ETBSO	0.0557	0.3668	-0.5218	-0.4418
	(0.03)	(0.17)	(-0.26)	(-0.22)
ETBSO	-1.1985	-1.0805	0.5969	0.5029
	(-0.78)	(-0.70)	(0.43)	(0.36)
CHG_NOLCF	0.0042	-0.0142	0.0595	0.0642
	(0.03)	(-0.11)	(0.65)	(0.71)
NOLCF	-0.0182	-0.0070	-0.0611	-0.0620
	(-0.22)	(-0.09)	(-1.12)	(-1.16)

TABLE 8, Panel A (continued)

	Tax Risk (Tax-Spike 3-Year)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	0.0084	-0.1565*	-0.0197	-0.1104*
	(0.08)	(-1.72)	(-0.30)	(-1.80)
N	11,859	11,859	16,587	16,587
Adj. R-sq	0.0154	0.0149	0.0119	0.0122

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 8
The Impact of Diversification on the Relation between Tax Avoidance and Tax Risk (Tax Spikes)

Panel B: 5-Year Measure

	Tax Risk (Tax-Spike 5-Year)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.4322	0.2807	0.3147**	0.3218**
	(1.46)	(1.32)	(2.04)	(2.35)
Diverse	-0.0080	-0.0035	-0.0099**	-0.0024
	(-1.43)	(-1.40)	(-2.03)	(-0.85)
Diverse x TaxAvoid	-0.0161	-0.0096	-0.0320*	-0.0277*
	(-0.80)	(-0.63)	(-1.79)	(-1.76)
PTBI	-0.0166	-0.0177	0.0147	0.0147
	(-0.22)	(-0.23)	(0.23)	(0.23)
Vol_PTBI	-0.1094	-0.1218	-0.2091	-0.2106
	(-0.61)	(-0.68)	(-1.62)	(-1.63)
BTM	-0.0192	-0.0187	-0.0255	-0.0255
	(-0.90)	(-0.88)	(-1.46)	(-1.46)
Leverage	0.0238	0.0223	0.0071	0.0050
	(0.81)	(0.76)	(0.27)	(0.19)
Size	0.0683***	0.0689***	0.0643***	0.0654***
	(3.26)	(3.29)	(4.05)	(4.11)
Shares_Out	0.0130	0.0130	0.0064	0.0058
	(0.61)	(0.62)	(0.36)	(0.33)
Vol_SpecialItems	0.4818	0.4853	0.1182	0.1230
	(1.19)	(1.18)	(0.61)	(0.63)
Vol_CashFlow	-0.1004	-0.0881	-0.0755	-0.0755
	(-0.50)	(-0.44)	(-0.47)	(-0.47)
Vol_ETBSO	0.6773	0.9487	1.5445	1.6263
	(0.31)	(0.43)	(0.70)	(0.73)
ETBSO	-0.5940	-0.4770	0.6924	0.6345
	(-0.38)	(-0.31)	(0.48)	(0.44)
CHG_NOLCF	-0.0592	-0.0806	-0.0234	-0.0190
	(-0.43)	(-0.58)	(-0.24)	(-0.20)
NOLCF	-0.0231	-0.0098	-0.0693	-0.0699
	(-0.26)	(-0.11)	(-1.11)	(-1.14)

TABLE 8, Panel B (continued)

	Tax Risk (Tax-Spike 5-Year)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	-0.1397	-0.2593**	-0.1064	-0.1869**
	(-1.10)	(-2.42)	(-1.30)	(-2.41)
N	11,859	11,859	16,587	16,587
Adj. R-sq	0.0231	0.0222	0.0225	0.0231

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 9
The Impact of Diversification on the Relation between Tax Avoidance and Tax Risk (GAAP ETR Vol.)

	Tax Risk (SD_GAAPETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	-0.0631	-0.0438	0.0540	0.0495
	(-0.71)	(-0.72)	(1.04)	(1.14)
Diverse	-0.0004	-0.0010	-0.0031*	-0.0010
	(-0.22)	(-1.26)	(-1.77)	(-1.15)
Diverse x TaxAvoid	0.0023	0.0006	-0.0095	-0.0062
	(0.37)	(0.13)	(-1.49)	(-1.17)
PTBI	-0.0535**	-0.0541**	-0.0459**	-0.0450**
	(-2.50)	(-2.53)	(-2.47)	(-2.41)
Vol_PTBI	-0.0092	-0.0084	-0.0735*	-0.0746*
	(-0.19)	(-0.17)	(-1.87)	(-1.90)
BTM	0.0172**	0.0170**	0.0155***	0.0154***
	(2.49)	(2.48)	(2.95)	(2.92)
Leverage	-0.0062	-0.0054	-0.0124	-0.0134
	(-0.69)	(-0.61)	(-1.52)	(-1.63)
Size	0.0132*	0.0130*	0.0179***	0.0184***
	(1.92)	(1.90)	(3.43)	(3.49)
Shares_Out	0.0067	0.0070	0.0014	0.0011
	(1.02)	(1.06)	(0.25)	(0.19)
Vol_SpecialItems	-0.2176*	-0.2206**	-0.2033***	-0.2014***
	(-1.95)	(-1.97)	(-3.04)	(-3.02)
Vol_CashFlow	0.0175	0.0181	0.0071	0.0063
	(0.35)	(0.36)	(0.16)	(0.14)
Vol_ETBSO	-0.4860	-0.5328	-0.3892	-0.3386
	(-0.79)	(-0.87)	(-0.68)	(-0.59)
ETBSO	-0.1353	-0.1546	-0.0983	-0.1438
	(-0.28)	(-0.32)	(-0.21)	(-0.30)
CHG_NOLCF	-0.0027	-0.0014	-0.0029	0.0018
	(-0.06)	(-0.03)	(-0.09)	(0.05)
NOLCF	0.0266	0.0256	0.0284	0.0263
	(0.79)	(0.76)	(1.26)	(1.16)

TABLE 9 (continued)

	Tax Risk (SD_GAAPETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	-0.0331	-0.0166	-0.0182	-0.0314
	(-0.72)	(-0.45)	(-0.58)	(-1.15)
N	7,385	7,385	10,329	10,329
Adj. R-sq	0.0684	0.0689	0.0608	0.0600

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 10
The Impact of Diversification (Alternative Measure) on the Relation between Tax Avoidance and Tax Risk

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
TaxAvoid	0.0507*	0.0654**	0.0167	0.0466**
	(1.84)	(2.31)	(0.75)	(2.10)
Diverse	-0.0044***	-0.0041***	-0.0022	-0.0026**
	(-3.00)	(-3.26)	(-1.42)	(-2.15)
Diverse x TaxAvoid	-0.0014	-0.0033	0.0019	-0.0028
	(-0.56)	(-1.26)	(0.48)	(-0.66)
PTBI	0.0301	0.0288	0.0209	0.0193
	(0.96)	(0.91)	(0.79)	(0.73)
Vol_PTBI	-0.1542	-0.1571	-0.1025	-0.1014
	(-1.58)	(-1.61)	(-1.33)	(-1.32)
BTM	-0.0100	-0.0097	-0.0142**	-0.0139**
	(-1.42)	(-1.39)	(-2.30)	(-2.26)
Leverage	-0.0092	-0.0099	-0.0124	-0.0122
	(-0.58)	(-0.63)	(-0.89)	(-0.88)
Size	0.0472***	0.0477***	0.0441***	0.0438***
	(4.44)	(4.49)	(5.03)	(4.99)
Shares_Out	-0.0078	-0.0087	-0.0019	-0.0022
	(-1.38)	(-1.55)	(-0.31)	(-0.36)
Vol_SpecialItems	0.1511	0.1500	0.0957	0.0920
	(1.23)	(1.22)	(0.88)	(0.84)
Vol_CashFlow	-0.1176	-0.1164	-0.0655	-0.0630
	(-1.30)	(-1.30)	(-0.82)	(-0.79)
Vol_ETBSO	-1.2285	-1.1636	-1.1401	-1.0833
	(-1.14)	(-1.09)	(-1.33)	(-1.27)
ETBSO	-0.3931	-0.3933	-0.0753	-0.0648
	(-0.60)	(-0.61)	(-0.13)	(-0.11)
CHG_NOLCF	-0.0111	-0.0113	-0.0101	-0.0078
	(-0.32)	(-0.33)	(-0.34)	(-0.26)
NOLCF	0.0063	0.0061	-0.0241	-0.0238
	(0.18)	(0.17)	(-0.98)	(-0.98)
LOSS	-0.0081	-0.0084	-0.0061	-0.0064
	(-1.11)	(-1.16)	(-0.92)	(-0.96)

TABLE 10 (continued)

	Tax Risk (SD_CETR)			
	5-Year TaxAvoid	*5-Year Adj. TaxAvoid*	*3-Year TaxAvoid*	*3-Year Adj. TaxAvoid*
Constant	-0.0957	-0.1075	-0.1030*	-0.1048*
	(-1.31)	(-1.48)	(-1.76)	(-1.79)
N	3,610	3,610	5,086	5,086
Adj. R-sq	0.0665	0.0667	0.0559	0.0568

Note: I use OLS with firm and year fixed effects and cluster standard errors at the firm level. The symbols *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

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