TAX IMPLICATIONS OF CEO COMPENSATION PACKAGES

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Abstract:
This study examines associations between different forms of CEO compensation and corporate tax avoidance activity. I develop a new theoretical framework for predicting the associations between CEO compensation and corporate tax avoidance. I also rank forms of compensation by their impact on various forms of tax avoidance ranging from conservative to aggressive approaches. This assists corporate boards by providing information on which forms of tax avoidance are associated with various compensation schemes. That is, the results inform corporate boards about potential tax consequences of implementing certain compensation packages.

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CHAPTER I

INTRODUCTION

The spectrum of tax avoidance activities extends from aggressive tax avoidance activities, such as tax shelter utilization, to more conservative activities, such as conforming tax avoidance methods (see Hanlon and Heitzman 2010; Lisowsky, Robinson, and Schmidt 2013; Badertscher, Katz, Rego, and Wilson 2019). Prior studies examine associations between some of these tax avoidance activities and various components of executive compensation packages, including equity incentives (Rego and Wilson 2012), inside debt (Chi, Huang, and Sanchez 2017), and bonus compensation (Gaertner 2014). However, these prior studies do not consider the full spectrum of tax avoidance activities in their analyses. Similarly, these studies often focus their analyses on one specific component of executive compensation, without considering or controlling for other executive compensation options available to corporate board compensation committees. I expand our understanding of the association between these constructs by analyzing multiple forms of executive compensation and tax avoidance activities.

Specifically, the purpose of this study is to analyze multiple forms of executive compensation along with the full range of tax avoidance activities to provide evidence of the tax consequences associated with each form of compensation.

Tax and governance research has investigated some links between corporate governance, manager compensation, and corporate tax avoidance activities. Desai and Dharmapala (2006) provided the basis for this line of research by arguing that tax avoidance and managerial rent extractions are complements. Their analysis assumes that tax avoidance reduces corporate transparency between the manager and the corporate board, which enables managerial rent extraction. Stated alternatively, well-governed firms discourage tax avoidance in order to limit managers' ability to divert corporate resources for personal benefit. Armstrong, Blouin, Jagolinzer, and Larcker (2015) update this theory by noting that compensation is a source of corporate governance. Their paper adopts a more traditional principal-agent framework and assumes that tax avoidance is one of many risky investment opportunities that corporate boards may wish to encourage or discourage depending on the board's appetite for risk.

This study continues this line of research by examining whether the form of executive compensation is associated with different levels or types of tax avoidance. Managers may engage in a level or type of tax avoidance that diverges from shareholder preferences creating additional agency costs. Corporate boards use different forms of compensation to align managerial incentives with shareholders and thereby reduce what we think of as traditional agency costs (Jensen and Meckling 1976; Fama and Jensen 1983). The existing literature is unclear about which forms of compensation have greater or lesser associations with various tax avoidance strategies. This study seeks to fill this gap by providing evidence on this very

issue. That is, corporate boards should consider the potential risks and agency costs specific to tax avoidance by fully understanding the tax avoidance implications of each component of compensation packages.

The three forms of executive compensation examined in this study include equity compensation, inside debt holdings, and bonus compensation. First, corporate boards use equity compensation to align managerial interests with those of shareholders (Rego and Wilson 2012). Equity compensation is disaggregated into "delta" and "vega", where delta measures managerial pay for performance sensitivity, and vega measures the sensitivity of managerial wealth to stock volatility (Guay 1999; Core and Guay 1999; Coles, Daniel, and Naveen 2006). Second, inside debt holdings primarily take the form of unsecured and unfunded pension benefits and deferred compensation which expose managers to risks similar to those faced by outside creditors. As such, inside debt generally encourages more conservative managerial decisions in order to protect their holdings (Chi et al. 2017). Finally, corporate boards also use bonus compensation and the associated performance metrics to align managerial behavior with shareholder interests. Corporate boards can align managerial interests with those of the shareholders by choosing compensation that incentivizes specific behavior that the shareholders desire. Bonus compensation metrics allow corporate boards to incentivize far more specific behavior than delta, vega, or inside debt. For example, bonus compensation can be based on non-financial metrics like employee turnover to encourage managers to expend resources in employee retention. Bonus compensation is often tied to financial metrics as well. By tying the bonus compensation to after-tax income, as opposed to pre-tax income, corporate boards inherently incentivize managers to lower tax expense (Gaertner 2014).

To measure the spectrum of tax avoidance activities available to firms, I focus on four measures of tax avoidance. First, to measure aggressive tax avoidance, I use an estimate of "reportable transactions" which are transactions flagged by the IRS as requiring taxpayers to file Form 8886. Reportable transactions represent the current state of research measurement with regards to tax sheltering behavior (see Lisowsky et al. 2013). Second, I use uncertain tax benefits (UTBs) to proxy for risky tax planning (Rego and Wilson 2012). UTBs represent the uncertain tax benefits accrued by firms under Interpretation No. 48 (FIN 48). Third, I use effective tax rates, which reflect a wide range of tax avoidance activities (Dyreng, Hanlon, and Maydew 2008). Finally, I use conforming tax avoidance to proxy for conservative tax avoidance (Badertscher et al. 2019). Conforming tax avoidance reduces tax liabilities by reducing both book income and taxable income.

I develop a theoretical framework for predicting the association between forms of executive compensation and corporate tax avoidance strategies based on whether the compensation scheme is primarily related to idiosyncratic risk or income. Some forms of executive compensation increase managerial appetite for risk while others decrease managerial appetite for risk. Alternatively, other forms of executive compensation incentivize managers by rewarding higher levels of corporate earnings. By similarly categorizing tax avoidance strategies according to their relation to idiosyncratic risk or earnings, I predict which forms of tax avoidance will be most strongly associated with each form of executive compensation.

Following prior literature, I formulate measurements of tax avoidance and compensation utilizing data from Compustat, Execucomp, CRSP, and IBES for the period 2006 to 2017. I separately regress each type of tax avoidance on each form of compensation while controlling for the other forms of compensation. After confirming which forms of

compensation are associated with which forms of tax avoidance, I test the explanatory power of each form of compensation on each form of tax avoidance. I find that delta is positively associated with aggressive measures of tax avoidance and negatively associated with the most conservative forms of tax avoidance. Delta is significantly associated with nearly every measure of tax avoidance meaning that changes to delta can have consequences in both conservative and aggressive forms of tax avoidance. Vega is positively associated with the tax avoidance strategies increasing idiosyncratic risk but is associated with fewer tax avoidance proxies than delta. Inside debt, consistent with its conservative nature, has a negative association with nearly every form of tax avoidance[1].

While delta, vega, and inside debt are commonly utilized to incentivize a range of managerial behavior, corporate boards should also consider that these compensation schemes also incentivize or discourage specific forms of tax avoidance. It is also important to consider that the form of compensation most strongly associated with one type of tax avoidance is not necessarily the form of compensation most strongly associated with other types of tax avoidance. For tax shelter participation, delta has the largest impact followed by inside debt. For conforming tax avoidance, inside debt impacts tax avoidance the most followed by delta.

This paper makes several contributions to the accounting literature as well as informing corporate boards about the implications of different forms of compensation. I present a simple

[1] In supplemental analyses I test alternative specifications of tax avoidance and inside debt. I find that measures of inside debt which are scaled by equity are generally more predictive of tax avoidance than raw measures of inside debt. I also find that the relation between equity compensation and UTBs varies depending on whether you are using UTB balances or UTB additions.

theoretical framework for predicting the association between compensation and corporate tax avoidance. By including equity compensation, inside debt, and bonus performance metrics simultaneously, this study provides the most comprehensive picture of how compensation influences corporate tax policy. Inside debt and vega impact managerial risk appetite in opposite directions, necessitating the inclusion of both variables for an accurate interpretation of tax policy implications. These results not only inform corporate boards which tax avoidance strategies are associated with which form of compensation, but also provide a picture of relative ranking regarding which forms of compensation have the greatest economic impact on the different forms of tax avoidance. This allows boards to consider the tax avoidance strategies and anticipate the tax effects from compensation packages that are in place for reasons other than tax. These results also contribute to the literature on inside debt, bonus compensation, tax shelters, and conforming tax avoidance by examining previously untested associations.

CHAPTER II

LITERATURE REVIEW

Forms of Executive Compensation

Although prior research identifies several determinants of effective tax rates, book-tax differences, and other measures of tax avoidance, there are few studies that examine the association between corporate governance and tax avoidance activities by firms. Executives may engage in levels or types of tax avoidance activities that diverge from shareholder preferences creating additional agency costs and corporate boards can use different governance mechanisms to minimize those costs, one being through incentive alignment. Minnick and Noga (2010) find that several measures of corporate governance are associated with varying levels of tax avoidance but fail to link the two constructs. Robinson, Xue, and Zhang (2012) and Hsu, Moore, and Neubaum (2018) both provide further evidence that corporate boards influence tax avoidance through both their advising and monitoring roles by studying the impact of the audit committee on tax planning. Armstrong et al. (2015) find that board independence and financial sophistication are

associated with tax avoidance using UTBs and long run effective tax rates as proxies for tax avoidance. Armstrong et al. (2015) also highlight how compensation is used as an additional governance mechanism. This study focuses in on three forms of compensation that have been previously linked to tax avoidance: (1) equity compensation, (2) inside debt, and (3) bonus compensation performance metrics.

First, equity compensation is a common governance tool intended to align managerial interests with shareholder preferences. Rego and Wilson (2012) provide a comprehensive analysis on the topic, finding that equity incentives are one determinant of corporate tax aggressiveness. They argue that tax avoidance is a risky activity and managers must be incentivized to undertake the costs associated with tax aggressiveness. Rego and Wilson (2012) distill equity incentives into measurements of how managerial wealth is tied to stock price (delta) and how managerial wealth is linked to stock return volatility (vega). Delta incentivizes managers to engage in costly effort to share in the stock price appreciation from that effort (Coles et al. 2006). To the extent that tax avoidance results in stock price appreciation, higher deltas should incentivize managers to engage in higher levels of tax avoidance. Vega is also designed to decrease agency cost, but while delta incentivizes effort, vega incentivizes risk. Manager's equity portfolios are often less diversified than investors, which may cause managers to prefer a lower level of risk than what is optimal for shareholders. By linking managerial wealth to stock price volatility, corporate boards incentivize increased managerial risk taking (Coles et al. 2006). Tax avoidance includes elements of both effort and risk, however prior research investigating the relation between equity compensation and tax avoidance has not found consistent conclusions (Powers, Robinson, and Stomberg 2016; Gaertner 2014; Rego and Wilson

2012; Kara, Mayberry, and Rane 2022). Notably Armstrong et al. (2015) find that the relationship between equity incentives and tax avoidance is sometimes positive and other times negative depending on where each corporation falls on the tax avoidance spectrum.

Second, corporate boards can use the amount of managerial inside debt holdings in an effort to manage agency costs. Inside debt primarily takes the form of unsecured and unfunded pension benefits and deferred compensation. Paying CEOs with debt-like compensation is common, and the amount of debt can be substantial. Wei and Yermack (2011) find that 84% of S&P 500 CEOs have inside debt holdings, the average exceeding $10 million. This exposes CEOs to risks similar to those faced by outside creditors because inside debt is normally held in unfunded and unsecured liabilities of the firm. This may cause CEOs to manage their firms more conservatively to protect their inside debt holdings (Chi, Huang, and Sanchez 2017). Corporate boards have the option to influence managerial risk taking through the availability and attractiveness of inside debt holdings. Similar to vega, inside debt holdings are associated with managerial risk, but while vega is positively associated with managerial risk, inside debt is negatively associated with managerial risk Chi, et al. (2017) and Kubick, Lockhart, and Robinson (2020) both investigate the relationship between tax avoidance, and inside debt. Chi, et al. (2017) theorize and find that inside debt discourages risky tax avoidance. Kubick et al. (2020) find a negative relation between tax avoidance and inside debt when controlling for the financial sophistication of executives.

Third, bonus compensation is another tool corporate boards use to align managerial interests with those of the shareholders. By tying bonus compensation to specific performance metrics, corporate boards express their preference for the areas executives

should expend greatest effort or incur greatest risk. This allows for more accurate alignment of shareholder and managerial interests. Researchers can identify corporate board's priorities by the performance metrics they choose in rewarding executives. Corporate boards can choose whether to compensate executives based on before or after-tax earnings. By using after-tax earnings as a performance metric, executives are incentivized to decrease tax expense, thereby increasing bonus compensation. Gaertner (2014) finds that corporations compensating CEOs based on after-tax performance metrics pay lower effective tax rates. Brown, Drake, and Martin (2016) also find that bonus compensation is associated with tax avoidance using after-tax performance metrics. Other researchers have found that bonus compensation based on cash flow performance metrics is a superior predictor of corporate tax avoidance (Powers, et al. 2016).

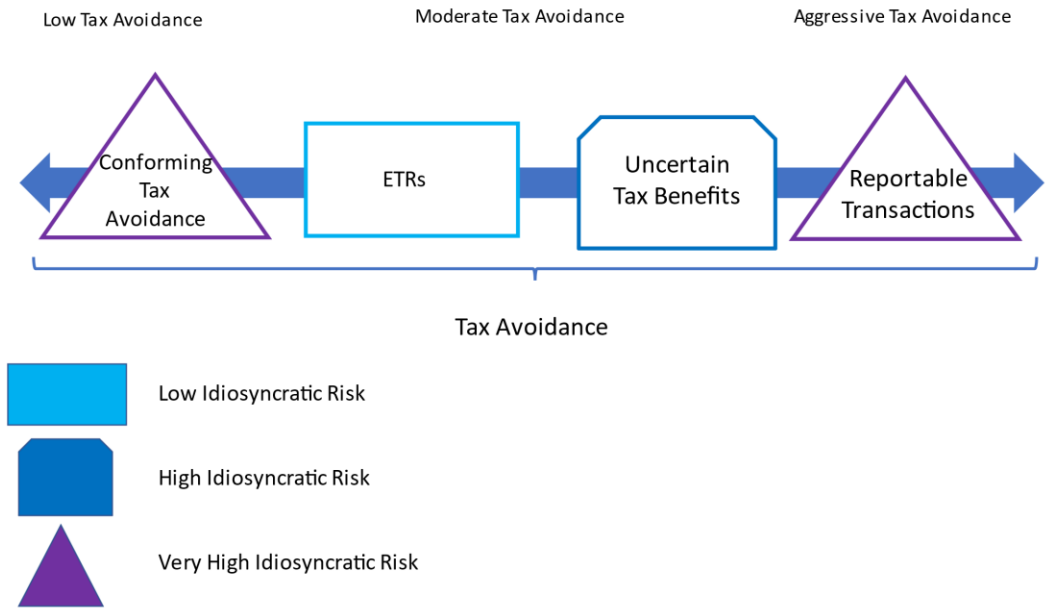
Tax Avoidance

While each of the three forms of compensation (equity compensation, inside debt, and bonus compensation) are linked to tax avoidance, it is important to recognize that tax avoidance is a broad spectrum that encompasses different levels of effort, risk, and priorities for executives[2]. I use four tax avoidance constructs that each represent different segments of the tax avoidance spectrum. Figure 1 is a re-creation of the continuum of tax avoidance as found in Lisowsky et al. (2013), modified with alterations and extensions to suit the focus of this study. I use conforming tax avoidance to measure conservative tax

[2] See Hanlon and Heitzman 2010 for a comprehensive summary of the various proxies, causes, and consequences for different types of tax avoidance

avoidance, effective tax rates to measure moderate tax avoidance, and UTBs and reportable transactions to measure aggressive tax avoidance.

Figure 1: Tax Avoidance Spectrum



Idiosyncratic Risk refers to the volatility of financial income (Fu 2009). Tax avoidance refers to the amount of tax expense avoided.

I place reportable transactions at the extreme aggressive end of the tax avoidance spectrum. Reportable transactions are the current iteration of what was formerly known as tax sheltering behavior. Tax shelter participation is commonly cited in the literature as representing the most aggressive form of tax avoidance. Tax shelters are illegal when they do not exhibit a business purpose other than the sole aim of evading taxes (Lisowsky 2010). Tax shelters are an appealing option when it comes to tax planning because they allow a reduction in taxable income without a corresponding reduction in book income (Treasury

1999). For example, firms associated with tax shelters generate positive abnormal returns (Wilson 2009).

In response to widespread tax shelter proliferation, the IRS established the Office of Tax Shelter Analysis in February of 2000. Apart from the regulatory crackdown on tax shelter usage, under the Internal Revenue Code section 6011, firms are required to attach Form 8886 to tax returns for each reportable transaction. There are sizeable penalties for nondisclosure and inaccuracy, as well as mandatory public disclosure for failing to comply with section 6011 (Lisowsky et al. 2013). These changes led some researchers to argue that tax shelters of the 1990s are no longer prevalent (Blouin 2014). Lisowsky et al. (2013) use proprietary data to develop a measure of the newer "reportable transactions" which represents the current brand of tax sheltering. They find that the tax shelter prediction score developed in Lisowsky (2010) is the most accurate predictor of reportable transactions.

After FIN 48 researchers began using unrecognized tax benefits (UTBs) as a proxy for tax avoidance. The FASB added FIN 48 out of concern that companies were recognizing tax benefits prematurely. Recognizing the tax benefit of an uncertain tax position, that may not be sustained in court, results in overstated financial income. FIN 48 standardized the recognition of uncertain tax positions. Each firm estimates the likelihood that their uncertain tax positions would be upheld in court. If the estimated probability of the tax position being sustained is less than 50%, then the UTB is generated in an amount equal to the tax benefit generated by the uncertain tax position. When the estimated probability of the position being sustained is more likely than not (>50%), then the UTB is less than the total tax benefit generated.

Recording a UTB has a direct impact on the financial reporting of book income. As such, recording a UTB is associated with financial reporting incentives as well as tax planning incentives. Lisowsky et al. (2013) investigates the role UTBs can play in calculating reportable transactions. UTB is a good candidate because reportable transactions are least likely to meet the more-likely-than-not threshold. They find that UTB can predict reportable transactions, but less reliably than the Lisowsky (2010) tax shelter participation score. Executive compensation is linked to UTBs in Rego Wilson (2012) using predicted UTBs. Armstrong et al. (2015) and Powers et al. (2015) use UTB ending balances to link tax avoidance to compensation. UTB additions are used with increasing frequency in the tax avoidance literature but remain unlinked to executive compensation.

As illustrated in Figure 1, between the extremes of reportable transactions on one end, and conforming tax avoidance on the other end, there are continuous measures of tax avoidance. I use effective tax rates (ETRs) and UTBs as they are featured prominently in prior literature. ETRs are computed by dividing tax liabilities by before-tax profits. GAAP ETR is calculated using total income tax expense divided by pre-tax accounting income, while cash ETR is calculated using cash taxes paid divided by pre-tax accounting income. GAAP ETR is more reflective of the impact book reporting of tax policies, while cash ETR more closely approximates cash taxes paid. While tax shelters and conforming tax avoidance are more saliently associated with tax avoidance, ETRs reflect the impact of numerous other financial decisions in addition to decreasing tax liabilities.

On the conservative end of the tax avoidance spectrum lies conforming tax avoidance. Conforming tax avoidance temporarily reduces book income for the purpose of reducing taxable income. Managers can decrease both book income and taxable income by

altering the timing of real economic transactions, such as accelerated depreciation, pre-paying financing costs, or delaying revenue into subsequent periods. Badertscher, Katz, Rego, and Wilson (2019) develop and validate a measure for conforming tax avoidance. They find that conforming tax avoidance strategies are commonly used across both time and industries by publicly traded companies. Unlike other forms of tax avoidance, conforming tax avoidance carries no tax risk because it does not create differences between book and tax income. However, temporarily decreasing book income can create idiosyncratic risk (Kara et al. 2022). Kara et al. (2022) find that accelerating expenses and delaying revenue recognition results in divergent investor expectations. Temporarily lowering book income makes the firm less likely to meet earnings benchmarks such as analyst forecasts which increases idiosyncratic risk.

Towery (2017) finds that the imposition of Schedule UTP reporting requirements prompted firms to change their financial reporting of tax positions without changing the underlying tax positions. Badertscher et al. (2019) validate a measure for conforming tax avoidance and find it to be prevalent across both industries and time periods. They also find that the extent to which firms engage in conforming tax avoidance depends on capital market pressures. Kara et al. (2022) find that conforming tax avoidance is positively related to vega and negatively related to delta. Including conforming tax avoidance is essential to understanding the holistic relationship between compensation incentives and tax avoidance (Badertscher et al. 2019).

CHAPTER III

HYPOTHESIS DEVELOPMENT

This paper seeks to create a guide concerning which forms of compensation are associated with which tax avoidance strategies. Figure 2 depicts a summary of the forms of compensation and the tax avoidance proxies I examine. Panel A displays the forms of compensation in this study: delta, vega, inside debt, and bonus compensation. Beside each type of compensation, I classify the construct as primarily increasing or decreasing either financial income or primarily increasing or decreasing idiosyncratic risk. Financial income refers to long-run expected earnings. Policies that avoid more taxes are expected to, on average, result in higher levels of income. Idiosyncratic risk refers to the volatility of net income and is a component of total firm risk. Firm risk is the risk inherent in a firm's operations as a result of external or internal factors that can affect a firm's profitability. Firm risk is disaggregated into systematic and unsystematic risks with the unsystematic, or idiosyncratic, risk referring to the unique firm-specific risks (see Fu 2009; Jo and Na 2012;

Ross et al. 2011). Idiosyncratic risk is measured as the standard deviation or variance of the firm's stock return.

Delta measures pay-for-performance sensitivity, with higher deltas rewarding managers who increase stock price. That is, delta is positively associated with increasing financial income. Vega measures managerial wealth sensitivity to stock-return volatility. Vega is positively associated with idiosyncratic risk by rewarding managers who achieve higher stock volatility. Inside debt is negatively associated with idiosyncratic risk by linking managerial wealth to deferred compensation. Inside debt incentivizes managers to minimize risk in order to protect their deferred compensation. Bonus compensation is positively associated with financial income by linking the amount of compensation to the level of earnings achieved.

Figure 2: Compensation and Tax Avoidance

Panel A: Forms of Compensation

	Financial Income	Idiosyncratic Risk
Delta	**Dominant Effect +**	
Vega		**Dominant Effect +**
Inside Debt		**Dominant Effect -**
Bonus Compensation	**Dominant Effect +**	

Panel B: Tax Avoidance Measures

	Financial Income	Idiosyncratic Risk	Tax Avoidance
Conforming Tax Avoidance	**Decrease**	**Increase**	**Low**
ETRs	**Small Increase**	**?**	**Medium**
UTBs	**Increase**	**Increase**	**High**
Reportable Transactions	**Increase**	**Increase**	**Highest**

Financial Income refers to expected long-run after-tax net income. Idiosyncratic Risk refers to the volatility of financial income (Fu 2009). Tax avoidance refers to the amount of tax expense avoided.

Panel B of Figure 2 displays the tax avoidance constructs in this study from least to most tax aggressive: conforming tax avoidance, effective tax rates, UTBs, and reportable transactions. Beside each construct I indicate whether financial income increases or decreases, and whether idiosyncratic risk increases or decreases. Conforming tax avoidance decreases book income in order to minimize tax expense, which negatively impacts financial income. While there is no tax risk involved in conforming tax avoidance, intentionally decreasing book income significantly increases idiosyncratic risk (Kara et al. 2022). Conforming tax avoidance falls on the most conservative end of both the tax avoidance spectrum, decreases financial income, and increases idiosyncratic risk.

ETRs represent a broad range of tax strategies and are positively associated with both financial income and risk (Hanlon and Heitzman 2010). ETRs represent more aggressive strategies than conforming tax avoidance, but more conservative strategies than UTBs and reportable transactions. ETRs represent small idiosyncratic risk and only moderate increases to financial income. UTBs proxy for aggressive and risky tax avoidance (Rego and Wilson 2012)and represent more aggressive tax strategies than ETRs with the potential for greater tax savings over time. UTBs also represent higher financial risk than ETRs. UTBs are reported whenever management believes there is less than a fifty percent chance of a tax position being upheld in court. Prior research suggests UTBs increase risk by drawing the attention of the IRS (Bozanic, Hoops, Thornock, and Williams 2017). UTBs therefore rank high in terms of tax avoidance, financial income, and idiosyncratic risk. Reportable transactions represent the most aggressive tax transactions flagged by the IRS as they are designed to minimize tax expense without changing financial income. Reportable transactions are subject to significant scrutiny by tax authorities and are associated with significant monetary penalties and mandatory disclosure. They represent the largest potential for tax savings, as well as significant idiosyncratic risk.

I hypothesize that the relation between compensation incentives and tax avoidance strategies will reflect the extent to which financial income and idiosyncratic risk align between the two constructs. Delta encourages managers to engage in activities that increases financial income with less regard to risk. I therefore expect delta to be positively associated with the tax avoidance measures that also increase financial income.

H1: ***Delta is positively associated with tax avoidance strategies that increase financial income.***

Unlike delta, vega is primarily associated with idiosyncratic risk. Vega incentivizes managers to engage in strategies that increase stock volatility. I therefore expect vega to be positively associated with tax avoidance measures that also increase idiosyncratic risk.

H2: ***Vega is positively associated with tax avoidance strategies that increase idiosyncratic risk.***

Inside debt is negatively associated with managerial risk taking. Managers are incentivized to avoid any risks that could jeopardize their pensions and deferred compensation. I therefore expect inside debt to be negatively associated with tax avoidance measures that also increase idiosyncratic risk.

H3: ***Inside debt is negatively associated with tax avoidance strategies that increase idiosyncratic risk.***

Basing bonus compensation on after-tax or cash flow performance metrics incentivizes managers to maximize financial income through either increasing earnings or decreasing tax expense. Like delta, this compensation incentive is most closely related to financial income. I therefore expect a similar association.

H4: ***Bonus compensation is positively associated with tax avoidance strategies that increase financial income.***

CHAPTER IV

METHODOLOGY

The following sections describe the measures of tax avoidance and executive compensation, as well as the regression model used in the primary analyses. More detailed descriptions of each of the measures used in the analyses are provided in Appendix A.

Measures of Tax Avoidance

Following Badertscher et al. (2019) and Kara et al. (2022), conforming tax avoidance (*ConformTax*) is calculated by using OLS regression to separately estimate the following model by three-digit SIC code and fiscal year:

$$TAXPAID\_TO\_ASSETS_{it} = \beta_0 + \beta_1 BTD_{it} + \beta_2 NEG_{it} + \beta_3 BTD_{it} \; x \; NEG_{it} + \beta_4 NOL_{it} + \beta_5 \Delta NOL_{it} + \varepsilon \quad (1)$$

TAXPAID_TO_ASSETS is the ratio of cash taxes paid (TXPD) to lagged total assets (AT). *TAXPAID_TO_ASSETS* encompasses total tax avoidance, both conforming and non-conforming. The independent variables remove the impact of non-conforming tax strategies while controlling for net operating loss carryforwards. *BTD* is book-tax differences calculated by subtracting taxable income from book income (PI) scaled by lagged assets. *NEG*, an indicator variable, equals one for firm-years featuring negative book-tax differences and zero otherwise. *NOL*, an indicator variable, equals one for firm-years with positive lagged net operating loss carryforwards (TLCF) and zero otherwise. Δ*NOL* controls for any changes in net operating loss carryforwards as of the beginning of each fiscal year. The residual (*ConformTax*) represents the remaining tax avoidance after removing the impact of non-conforming tax avoidance. *ConformTax* is multiplied by negative one for ease of interpretation, so that the measure is increasing in conforming tax avoidance.

I calculate GAAP ETR (*GaapETR*) as book tax expense (TXT) divided by pre-tax book income (PI) minus special items (SPI), and cash ETR (*CashETR*) as cash taxes paid (TXPD) divided by pre-tax book income minus special items. ETR measures are multiplied by negative one so that the measurements are increasing in tax avoidance. The next tax avoidance measures is the logged value of UTB ending balances (*Log_UTB_bal*)[3]. Any missing UTB values are dropped due to the missing UTB data in Compustat.

I calculate reportable transactions using the tax shelter prediction score (*ShelterScore*) following Lisowsky (2010) using the following equation:[4]

[3] I use logged as opposed to scaled UTB due to its improved predictive ability per Lisowsky et al. (2013).
[4] Alternative tax shelter proxies include the Wilson (2009) measure and UTBs per Lisowky et al. (2013). I opt for the Lisowsky (2010) over Wilson (2009) given the prior's improved ability over Wilson (2009) at predicting reportable transactions (see Lisowsky et al. 2013). The Lisowsky (2010) model requires extensive hand collection of tax haven information from each observations' Form 10-K which explains why many researchers still opt for the Wilson (2009) model (Chyz et al. 2019). Lisowsky et al. (2013) find that UTBs can also be used to proxy for

$$Shelter_{it} = -7.059 + 0.032\ x\ BTD_{it} + 0.924\ x\ DAP_{it} - 0.697\ x\ Leverage_{it} + 1.397\ x\ Size_{it} + 2.473\ x\ ROA_{it} + 3.569\ x\ Foreign_{it} - 3.023\ x\ R\&D_{it} + 0.790\ x\ TaxHav_{it} + 0.015\ x\ LagETR_{it} + 1.048\ x\ EqEarn_{it} - 0.687\ x\ MezzFin_{it} + 3.186\ x\ Big_{it}5 + 1.063\ x\ Litigation_{it} + 0.140\ x\ NOL_{it} \quad (2)$$

Shelter is a linear combination of the above listed variables which are described in Appendix A. After calculating *Shelter,* the prediction score is calculated as:

$$ShelterScore = \frac{e^{Shelter}}{1+e^{Shelter}} \quad (3)$$

Measures of Executive Compensation

Delta, *Vega*, *InsideDebt*, and *Bonus* are the four independent variables of interest. Inside debt can be measured in different ways. I calculate CEO inside debt (*InsideDebt*) by scaling total CEO inside debt holdings by lagged assets following Chi et al. (2017). CEO inside debt is the accumulated present value of the CEO's pension and deferred compensation. Alternative specifications for Inside debt are examined in supplemental analyses. *Bonus* is an indicator variable equal to 1 when a CEO's bonus compensation is based on the requisite performance metric (after-tax income or cash flow), and zero otherwise, following Gaertner (2014) and Powers et al. (2016). Both forms of bonus compensation are explored further in supplemental analyses.

Primary Regression Analyses

I test the hypotheses by estimating separate OLS regressions for each tax avoidance proxy. Figure 3 illustrates my predictions for each unique combination of compensation incentives and

reportable transactions, however UTBs alone are less predictive than the Lisowsky (2010) measure. Lisowsky et al. (2013) also find that the UTBs reported in Compustat suffer from severe under-reporting and instances of incorrect dollar amountsand using proprietary FIN 48 data from the IRS, find that of the 3,262 firm-years in their analysis, 1,046 show a missing value in Compustat. Of the 1,046 missing values, 258 are zero balances for UTB while 788 represent non-zero balances. Given that Lisowsky (2010) is the most reliable predictor of reportable transactions without proprietary data, I calculate tax sheltering using Lisowsky (2010)

tax avoidance constructs as described above and portrayed in Figure 2. I formally test the predictions using the following model:

$$\begin{aligned} TaxAvoidance_{it} = {} & \beta_0 + \beta_1 Delta_{it} + \beta_2 Vega_{it} + \beta_3 InsideDebt_{it} + \beta_4 Bonus_{it} + \beta_5 Ccomp_{kt} + \\ & \beta_6 ManagerialAbility_{kt} + \beta_7 Age_{kt} + \beta_8 Tenure_{kt} + \beta_9 Female_{kt} + \beta_{10} R\_D_{it} + \\ & \beta_{11} Adv_{it} + \beta_{12} Capex_{it} + \beta_{13} Int\_Exp_{it} + \beta_{14} Foreign_{it} + \beta_{15} EBIT_{it} + \\ & \beta_{16} NOL_{it} + \beta_{17} SG\&A_{it} + \beta_{18} Intangibles_{it} + \beta_{19} Size_{it} + \beta_{20} Leverage_{it} + \\ & \beta_{21} S\&P_{it} + \varepsilon \end{aligned} \quad (4)$$

Ccomp, *Managerial Ability*, *Age*, *Tenure*, and *Female* are manager-level controls. *Ccomp* is total CEO compensation. Under principal agent theory, managers must be compensated with a risk premium to engage in risky tax avoidance (see Armstrong, Blouin, and Larcker 2012; Gaertner 2014). *ManagerialAbility* is a measure of managerial ability from Peter Demerjian's website (see Demerjian, Lev, and McVay 2012). *Age*, *Tenure*, and *Female* are the other controls for manager characteristics and are defined in Appendix A. The remaining variables are firm level controls. I control for research and development (*R_D*), advertising (*Adv*), capital expenditures (*Capex*), interest expense (*Int_Exp*), foreign income (*Foreign*), firm performance (*EBIT*), net operating loss (*NOL*), selling, general and administrative expenses (*SG_A*), intangibles (*Intang*), firm size (*Size*), leverage (*Leverage*), and whether or not the firm is rated by the Standard & Poor's Global Ratings(*S_P*). I also control for year and industry effects to alleviate concerns about period or industry specific shocks. I cluster standard errors at the firm level.

Figure 3: Predicted Associations

	Conforming Tax Avoidance	ETRs	UTBs	Reportable Transactions
Delta	-	?	+	+
Vega	+	?	+	+
Inside Debt	-	?	-	-
Bonus Compensation	-	?	+	+

Sample Selection and Descriptive Statistics

I begin the sample selection process with all CEOs from the Execucomp database for the years 2007 – 2017. Both inside debt and UTBs require data which is unavailable prior to 2007. I end my sample in 2017 to avoid any confounding effects from the Tax Cuts and Jobs Act. I exclude observations for utility firms (SIC codes 4900-4999) because the tax laws governing utility industries are different than other industries. I also exclude observations from financial industries (SIC codes 6000 – 6999) because many financial institutions are flow-through entities which do not pay corporate income tax. I require non-missing values for each form of executive compensation, as well as the control variables not specifically singled out in Appendix A. Requiring non-missing values for each form of executive compensation drastically reduces the sample size when requiring non-missing bonus compensation metrics. I therefore perform my primary analysis on delta, vega, and inside debt. In supplemental analysis I include bonus

compensation and repeat pertinent tests to address H4. I also allow my sample size to vary depending on the availability of the dependent variable to maximize statistical power. Table 1 illustrates the sample selection process.

Table 1. Sample Selection

Panel A: Sample Distribution

	Number of Observations
Intersection of Compustat, Execucomp, and CRSP databases for all firm-year observations with CEOs	22,275
Remove observations from financial and utility industries	(5,435)
Remove observations with missing control variables	(710)
Remove observations with missing compensation measurements	(1,447)
Total sample before tax avoidance measures	14,683

Panel B: Final Sample

Using Conforming Tax Avoidance	6,778
Using GAAP ETR	12,459
Using Cash ETR	12,318
Using UTB Ending Balance	12,736
Using Reportable Transactions	10,763

Notes: This table summarizes the sample selection procedure for this study. Sample extends from fiscal year 2007 through 2017.

Descriptive statistics for my final sample are provided in Table 2.[5] The mean value for *ConformTax* is -0.004 which is consistent with Kara et al. (2022). Mean values for *GaapETR* and *CashETR* are 0.27 and 0.25. The mean value for *Log_UTB*_bal is 2.56 which is similar to Lisowsky et al. (2013). My mean and median values of tax shelter are slightly higher than what

[5] As of the writing of this draft, I do not have the data for after-tax bonus compensation metrics. Results using bonus compensation data is forthcoming and future drafts will be updated.

Chi et al. (2017) report. This is due to variation in sample, as our mean and median shelter scores are similar before constraining our samples. I further validate my measure by comparing my *ShelterScore* with a sample *ShelterScore* provided by Petro Lisowsky[6]. Mean values of *Delta* and *Vega* are 5.17 and 3.28 which closely match Kara et al. (2022). The mean value for *InsideDebt* is 1.086 which is similar to Chi et al. (2017).

[6] My *ShelterScore* features high correlation of 0.98 and 0.89 with shelter scores from Petro Lisowsky using Spearman and Pearson correlation.

Table 2. Descriptive Statistics

Dependent Variables	Observations	Mean	Std. Dev.	1st Pctl.	Median	99th Pctl.
ConformTax	6778	-0.0040	0.0205	-0.0887	0.0000	0.0382
GaapETR	12459	-0.2731	0.1733	-1.0000	-0.2937	0.0000
CashETR	12318	-0.2470	0.1871	-1.0000	-0.2347	0.0000
Log_UTB_bal	12736	2.5649	1.8532	0.0000	2.3535	7.7021
ShelterScore	10763	0.9720	0.1174	0.2216	0.9996	1.0000
Variables of Interest	**Observations**	**Mean**	**Std. Dev.**	**1st Pctl.**	**Median**	**99th Pctl.**
Delta	14683	5.1720	1.5845	0.6850	5.1882	9.2250
Vega	14683	3.2789	2.0613	0.0000	3.6598	7.0394
InsideDebt	14683	1.0859	2.3545	0.0000	0.0498	14.1021
Executive Controls	**Observations**	**Mean**	**Std. Dev.**	**1st Pctl.**	**Median**	**99th Pctl.**
Ccomp	14683	6.6829	0.5385	4.6173	6.7060	8.3115
ManagerialAbility	14683	0.0084	0.1503	-0.2293	-0.0318	0.5714
Age	14683	55.7695	6.8906	40.0000	56.0000	74.0000
Tenure	14683	6.0045	4.4050	0.0000	5.0000	20.0000
Female	14683	0.0403	0.1966	0.0000	0.0000	1.0000
Firm Controls	**Observations**	**Mean**	**Std. Dev.**	**1st Pctl.**	**Median**	**99th Pctl.**
R_D	14683	0.0392	0.0709	0.0000	0.0045	0.4080
Adv	14683	0.0149	0.0348	0.0000	0.0000	0.2122
Capex	14683	0.1091	0.0764	0.0122	0.0879	0.4270
Int_Exp	14683	0.0140	0.0151	0.0000	0.0103	0.0782
Foreign	14683	0.6958	0.4601	0.0000	1.0000	1.0000
EBIT	14683	0.1813	0.4144	-1.8741	0.1526	2.1537
NOL	14683	0.6378	0.4806	0.0000	1.0000	1.0000
SG_A	14683	0.2666	0.2312	0.0000	0.2075	1.2412
Intang	14683	0.2496	0.2516	0.0000	0.1825	1.2417
Size	14683	7.3818	1.6210	3.8267	7.3067	11.6391
Levrerage	14683	0.2294	0.2003	0.0000	0.2079	0.9034
S_P	14683	0.9533	0.2110	0.0000	1.0000	1.0000

This table reports descriptive statistics of the sample. The statistics report firm-year values. All continuous variables are winsorized at the 1st and 99th percentile of their annual distribution. Variable definitions are listed in appendix A

Table 3 displays the correlation matrix of tax avoidance proxies and forms of executive compensation. There is significant positive correlation between *Delta* and every measure of tax avoidance except *ConformTax* which is negatively correlated with *Delta*. This supports the prediction that *Delta* is positively associated with methods of tax avoidance that increase financial income and negatively associated with methods of tax avoidance that decrease financial income. *Vega* also features positive correlation with each measure except for the *CashETR* (no significance), and *ConformTax* (negative correlation). The latter result does not support H2 which predicts a positive correlation between *ConformTax* and *Vega*. *InsideDebt* is significantly negatively correlated with every measure of tax avoidance except for *GaapETR* and *ShelterScore*, both of which are insignificant correlations. The negative correlations suggests that inside debt discourages risky tax avoidance, consistent with inside debt aligning CEO incentives with those of debtholders. Additional analysis with control variables provides more insight into these associations.

Table 3

Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	Delta	1.00							
(2)	Vega	**0.48*** **	1.00						
(3)	InsideDebt	0.02	0.02	1.00					
(4)	ConformTax	**-0.11*** **	**-0.03** **	**-0.04*** **	1.00				
(5)	GaapETR	**0.10*** **	**0.11*** **	-0.01	**0.09*** **	1.00			
(6)	CashETR	**0.04** **	0.01	**-0.08*** **	**0.40*** **	**0.31*** **	1.00		
(7)	Log_UTB_bal	**0.33*** **	**0.36*** **	**-0.10*** **	**0.03***	**0.16*** **	**0.04** **	1.00	
(8)	ShelterScore	**0.10*** **	**0.08*** **	0.01	**-0.06*** **	**0.09*** **	**-0.08*** **	**0.19*** **	1.00

This table presents the Spearman correlations of the variables of interest. Continuous variables are winsorized at the 1st and 99th percentile of then annual distribution. Variable definitions are listed in Appendix A. *, **, and *** indicate statistical significance at p<0.1, 0.05 and 0.01 respectively.

CHAPTER V

FINDINGS

Multivariate Results

Table 4 displays the results from separately estimating Equation (4) for each of the five tax avoidance proxies. I find some support for H1. *Delta* is negatively associated with *ConformTax* and *GaapETR* but positively associated with the remaining tax avoidance measures with the exception of *Log_UTB_bal* which is insignificant[7]. Interestingly, I find that while *Delta* is positively associated with *CashETR*, it is negatively associated with *GaapETR*. According to the Lisowsky et al. (2013) tax avoidance spectrum, *CashETR* represents more aggressive tax avoidance strategies than *GaapETR* with a greater potential for increasing financial income. The inconsistent relation between equity incentives and ETR measures is consistent with prior research (Powers et al. 2016). These findings suggest that delta is increasing in tax avoidance.

[7] In supplemental analysis I find that Delta is significantly positively related to current year UTB additions.

Table 4. Tax avoidance and forms of executive compensation

VARIABLES	DV ConformTax	DV GaapETR	DV CashETR	DV Log_UTB_bal	DV ShelterScore
Delta	-0.001***	-0.007***	0.005**	0.003	0.007***
	(0.000)	(0.000)	(0.026)	(0.800)	(0.000)
Vega	0.000*	0.002	0.001	0.034***	-0.001
	(0.089)	(0.163)	(0.566)	(0.001)	(0.166)
InsideDebt	-0.000*	-0.001	-0.001	-0.001	0.003***
	(0.065)	(0.406)	(0.144)	(0.872)	(0.000)
Ccomp	-0.000	-0.001	0.008	0.030	0.011**
	(0.592)	(0.809)	(0.100)	(0.452)	(0.019)
ManagerialAbility	-0.019***	-0.014	0.019	0.442***	0.022
	(0.000)	(0.330)	(0.260)	(0.002)	(0.165)
Age	-0.000	-0.000	-0.000	-0.004	-0.001*
	(0.919)	(0.699)	(0.385)	(0.164)	(0.080)
Tenure	0.000	-0.000	-0.002**	-0.007	-0.001
	(0.792)	(0.998)	(0.014)	(0.171)	(0.315)
Female	0.002	0.001	0.007	-0.101	0.001
	(0.302)	(0.925)	(0.584)	(0.352)	(0.955)
R_D	0.051***	0.405***	0.339***	3.359***	-0.421***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adv	-0.003	0.068	-0.051	0.596	-0.094
	(0.875)	(0.301)	(0.544)	(0.429)	(0.265)
Capex	-0.003	-0.077**	0.035	-1.042***	0.088***
	(0.578)	(0.011)	(0.338)	(0.000)	(0.005)
Int_Exp	0.149***	0.332	1.235***	8.293***	-0.297
	(0.001)	(0.265)	(0.000)	(0.000)	(0.279)
Foreign	0.000	0.003	-0.011*	0.261***	0.017**
	(0.784)	(0.533)	(0.098)	(0.000)	(0.023)
EBIT	-0.013***	-0.020***	0.015**	0.000	0.032**
	(0.000)	(0.001)	(0.017)	(0.990)	(0.012)
NOL	-0.002	0.008**	0.023***	0.042	-0.001
	(0.406)	(0.028)	(0.000)	(0.287)	(0.850)
SG_A	-0.016***	-0.003	-0.023	0.704***	-0.092***
	(0.000)	(0.832)	(0.215)	(0.000)	(0.001)
Intang	-0.002	0.030***	-0.008	-0.102	0.036***
	(0.271)	(0.003)	(0.472)	(0.223)	(0.000)

Table 4 - Continued

Size	0.000	0.010***	-0.004*	1.015***	0.018***
	(0.562)	(0.000)	(0.083)	(0.000)	(0.000)
Leverage	-0.003	0.020	-0.001	-0.560***	-0.004
	(0.391)	(0.346)	(0.968)	(0.000)	(0.809)
S_P	-0.004**	-0.021**	-0.027**	0.132	-0.013
	(0.014)	(0.028)	(0.017)	(0.120)	(0.184)
Constant	0.010	-0.269***	-0.337***	-5.028***	0.779***
	(0.286)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	6,778	12,459	12,318	12,736	10,763
R-squared	0.180	0.096	0.115	0.739	0.303
adj-R2	0.166	0.0775	0.0973	0.734	0.288

This table presents the results of OLS regressions of firms' tax avoidance proxies on CEO compensation packages (Delta, Vega, Inside Debt) and controls from 2007 to 2017 with year and three digit sic fixed effects with clustering by firm. Variable definitions are provided in Appendix A. Robust pval in parentheses. *, **, and *** indicate statistical significance at p<0.1, 0.05 and 0.01 respectively.

I find weak support for H2. *Vega* is positively associated with *Log_UTB_bal* and *ConformTax*[8]. UTB balances and conforming tax avoidance are tax avoidance strategies predicted to increase idiosyncratic risk. While all significant associations agree with H2, *Vega* is not significantly related to most proxies for tax avoidance. This runs contrary to the findings of Rego and Wilson (2009) who find that *Vega* is positively associated with tax shelters. Rego and Wilson (2012) use minimal control variables and the Wilson (2009) tax shelter score. In untabulated analysis, I duplicate their findings using my sample period with their controls and the Wilson (2009) tax shelter score. I find the same positive association as Rego and Wilson (2012), but after including my controls or the Lisowsky (2010) measure of reportable transaction, *Vega* loses its significance.

[8] In supplemental analysis I find that Vega is significantly negatively related to Long-run CashETR.

H3 predicts negative associations between inside debt and each measure of tax avoidance. All associations are negative, except for *ShelterScore*, but only *ConformTax* is significantly negative with *CashETR* approaching significance[9]. The significant positive association with *ShelterScore* runs contrary to the findings in Chi et al. (2017). Compared to Chi et al. (2017), my sample is larger, I control for other forms of compensation, and we use different econometric approaches. The insignificant relationship between inside debt and ETRs agrees with Kubick et al. (2020) who find that the relationship between inside debt and effective tax rates is not significant until controlling for high level of financial sophistication of the executive.

I refrain from commenting on H4 until the inclusion of bonus compensation in supplemental analysis.

My conforming tax avoidance results closely match Kara et al. (2022). *InsideDebt* is negatively associated with *ConformTax* suggesting that the idiosyncratic risk of temporarily reducing book income is greater than the decreased tax risk from a debtholder perspective.

Delta corresponds with decreasing *GaapETR*, decreasing *ConformTax* but increasing *CashETR*, and *ShelterScore*. On the other-hand, *Vega* increases *ConformTax* while also increasing *Log_UTB_bal*. In other words, *Delta* has diverging impacts on tax avoidance depending on if you are in the conservative or aggressive end of the spectrum, consistent with H1, while *Vega* has the same impact for both aggressive and conservative

[9] In supplemental analysis I find that an alternative specification of inside debt is negatively correlated with all tax avoidance proxies except for UTBs and reportable transactions.

forms of tax avoidance consistent with H2. I reject H3 due to the positive association between *ShelterScore* and *InsideDebt*.

Table 5 presents the incremental explanatory power of each form of compensation on each type of tax avoidance. I use a series of nested ordinary least squares models to assess the sequential and incremental explanatory power of each form of compensation as measured by the change in the R-squared of the models. I begin with the baseline model including all controls as well as industry and year fixed effects, but I do not include my primary independent variables. Row 1 includes *Delta* and measures the increased explanatory power of the model. Row 2 includes *Vega* in addition to *Delta* and measures the increased explanatory power of the model. Finally, *InsideDebt* is included to again measure the additional explanatory power from including the final form of compensation.

Table 5: Incremental significance of Delta, Vega, and Inside Debt on tax avoidance

Dependent Variable	(A) ConformTax	(B) GaapETR	(D) CashETR	(F) Log_UTB_bal	(H) ShelterScore
Baseline model with control variables					
R-squared	0.161	0.076	0.096	0.733	0.281
Observations	6,778	12,459	12,318	12,736	10,763
1. Incremental Significance of Delta					
Δ R-squared	1.86%	1.32%	1.04%	0.00%	1.42%
2. Incremental significance of Vega					
Δ R-squared	0.61%	1.30%	0.00%	0.14%	0.00%
3. Incremental significance of InsideDebt					
Δ R-squared	0.61%	0.00%	0.00%	0.00%	1.05%

This table displays the results from sequential testing of the incremental significance of Vega, InsideDebt, and Delta over the baseline models for the primary dependent measures, ConformTax, GaapETR, CashETR, Log_UTBbal, and ShelterScore. All models are estimated using OLS with year and industry fixed effects and robust standard errors, clustered by firm. Incremental significance is measured as the percentage increase in Adjusted R-squared. Variable definitions are provided in Appendix A.

Delta exhibits the largest increases to explanatory power across all tax avoidance measures except *Log_UTB_bal* where *Delta* features no explanatory power at all. Interestingly, I find that *Vega* increases the explanatory power of the model for predicting *GaapETR* nearly as much as *Delta*, but from Table 4 we see *Vega* is no longer a significant predictor once *InsideDebt* is included in the regression. *InsideDebt* only increases the explanatory power of the most and least aggressive tax avoidance policies, namely *ConformTax* and *ShelterScore*. In untabulated analysis, I find that *Vega*'s ability to increase the explanatory power of the model strongly depends on whether or not *Delta* is included in the model suggesting a strong interactive effect between the two.

Supplemental Analysis

I next test alternate specifications of key variables in order to fulfill the goal of holistically examining the associations between tax avoidance and different forms of executive compensation. Long run measures of effective tax rates are more reflective of tax policy than single year measures of effective tax rates (Dyreng et al. 2008). I use three-year running averages of both GAAP and Cash ETR.

Recently some researchers expressed caution concerning the usage of UTB balances due to the additional noise and relatively low power of the measure compared to UTB additions (DeSimone, Nickerson, Seidman, and Stomberg 2020). I next include the logged value of UTB additions which remain unliked to compensation incentives in prior literature. Panel A of Table 6 computes equation (4) using the new specifications of effective tax rates and UTBs

Inside Debt can be measured in a variety of methods representing different constructs (e.g., Wei and Yermack 2011; Chi et al. 2017; Kubick et al. 2020). Inside Debt is often measured using the CEO's debt to equity ratio which captures the incentives arising from the CEO's inside debt holdings relative to equity holdings. Another specification is whether or not the CEO's debt to equity ratio is greater than the firm's debt to equity ratio. The final specification is the CEO's debt to equity ratio scaled by the firms' debt to equity ratio. This measurement captures the degree to which the CEO's incentives align with shareholder incentives as opposed to debtholder incentives. I opt for the final specification (*DE_Ratio*) in addition to the *InsideDebt* measurement used in my primary analysis. Untabulated results using alternative specification yield similar inferences to the two measurements I employ. CEO Debt to equity ratio is calculated as *InsideDebt* divided by accumulated equity, where accumulated equity is the sum of the Black-Scholes value of restricted and unrestricted shares and options. I follow Coles, Daniel, and Naveen (2006) in order to calculate the value of shares and options. The firm's debt to equity ratio is calculated as the firm's total debt (DLTT + DLC) divided by the market value of equity (CSHO * PRCC_F). Panel B of Table 5repeats the analysis in Panel A using *DE_Ratio* as opposed to *InsideDebt*.

Long run measures of GAAP effective tax rates (*LRgaapETR*) exhibit the same relations as single year measures. Long run measures of cash effective tax rates (*LRcashETR*) are no longer positively associated with *Delta* and exhibit a negative association with *Vega*. Across both specifications of Inside Debt, *Log_UTB_bal* is positively associated with *Delta* but not *Vega*, and UTB current year additions (*Log_UTB_cy*) are positively associated with *Vega* but not *Delta*. This suggests that *Vega*

Table 6. Tax avoidance and forms of executive compensation

Panel A: Primary Inside Debt Specification								
	DV ConformTax	DV GaapETR	DV LRgaapETR	DV cashETR	DV LRcashETR	DV Log_UTB_cy	DV Log_UTB_bal	DV ShelterScore
Delta	-0.001***	-0.007***	-0.006***	0.005**	0.002	0.032***	0.003	0.007***
	(0.000)	(0.000)	(0.000)	(0.026)	(0.320)	(0.005)	(0.800)	(0.000)
Vega	0.000*	0.002	0.001	0.001	-0.001	-0.001	0.034***	-0.001
	(0.089)	(0.163)	(0.570)	(0.566)	(0.394)	(0.917)	(0.001)	(0.166)
InsideDebt	-0.000*	-0.001	-0.001	-0.001	-0.001	-0.005	-0.001	0.003***
	(0.065)	(0.406)	(0.418)	(0.144)	(0.526)	(0.504)	(0.872)	(0.000)
Ccomp	-0.000	-0.001	-0.000	0.008	0.002	-0.040	0.030	0.011**
	(0.592)	(0.809)	(0.943)	(0.100)	(0.613)	(0.292)	(0.452)	(0.019)
ManagerialAbility	-0.019***	-0.014	-0.032***	0.019	-0.001	0.484***	0.442***	0.022
	(0.000)	(0.330)	(0.008)	(0.260)	(0.967)	(0.000)	(0.002)	(0.165)
Age	-0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.004	-0.001*
	(0.919)	(0.699)	(0.427)	(0.385)	(0.317)	(0.623)	(0.164)	(0.080)
Tenure	0.000	-0.000	0.000	-0.002**	-0.001	-0.001	-0.007	-0.001
	(0.792)	(0.998)	(0.844)	(0.014)	(0.285)	(0.815)	(0.171)	(0.315)
Female	0.002	0.001	0.007	0.007	0.004	-0.023	-0.101	0.001
	(0.302)	(0.925)	(0.324)	(0.584)	(0.728)	(0.803)	(0.352)	(0.955)
R_D	0.051***	0.405***	0.330***	0.339***	0.396***	2.272***	3.359***	-0.421***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adv	-0.003	0.068	0.041	-0.051	-0.032	1.580***	0.596	-0.094
	(0.875)	(0.301)	(0.512)	(0.544)	(0.673)	(0.010)	(0.429)	(0.265)
Capex	-0.003	-0.077**	-0.052**	0.035	0.107***	0.149	-1.042***	0.088***
	(0.578)	(0.011)	(0.030)	(0.338)	(0.001)	(0.374)	(0.000)	(0.005)

Table 6. Panel A - Continued

Int_Exp	0.149***	0.332	0.493**	1.235***	0.732**	0.440	8.293***	-0.297
	(0.001)	(0.265)	(0.040)	(0.000)	(0.010)	(0.770)	(0.000)	(0.279)
Foreign	0.000	0.003	0.007	-0.011*	-0.009	0.052	0.261***	0.017**
	(0.784)	(0.533)	(0.106)	(0.098)	(0.136)	(0.223)	(0.000)	(0.023)
EBIT	-0.013***	-0.020***	-0.020***	0.015**	0.003	0.077***	0.000	0.032**
	(0.000)	(0.001)	(0.000)	(0.017)	(0.543)	(0.005)	(0.990)	(0.012)
NOL	-0.002	0.008**	0.008**	0.023***	0.019***	-0.031	0.042	-0.001
	(0.406)	(0.028)	(0.016)	(0.000)	(0.000)	(0.366)	(0.287)	(0.850)
SG_A	-0.016***	-0.003	-0.003	-0.023	-0.040**	0.412***	0.704***	-0.092***
	(0.000)	(0.832)	(0.802)	(0.215)	(0.019)	(0.000)	(0.000)	(0.001)
Intangibles	-0.002	0.030***	0.011	-0.008	-0.002	-0.063	-0.102	0.036***
	(0.271)	(0.003)	(0.189)	(0.472)	(0.874)	(0.347)	(0.223)	(0.000)
Size	0.000	0.010***	0.012***	-0.004*	0.001	0.687***	1.015***	0.018***
	(0.562)	(0.000)	(0.000)	(0.083)	(0.610)	(0.000)	(0.000)	(0.000)
Leverage	-0.003	0.020	0.009	-0.001	0.022	-0.409***	-0.560***	-0.004
	(0.391)	(0.346)	(0.609)	(0.968)	(0.236)	(0.002)	(0.000)	(0.809)
S_P	-0.004**	-0.021**	-0.020**	-0.027**	-0.023**	0.009	0.132	-0.013
	(0.014)	(0.028)	(0.014)	(0.017)	(0.044)	(0.893)	(0.120)	(0.184)
Constant	0.010	-0.269***	-0.341***	-0.337***	-0.288***	-4.163***	-5.028***	0.779***
	(0.286)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	6,778	12,459	11,010	12,318	10,812	12,530	12,736	10,763
R-squared	0.180	0.096	0.242	0.115	0.208	0.606	0.739	0.303
adj-R2	0.166	0.0775	0.225	0.0973	0.190	0.599	0.734	0.288

Table 6 - Continued

Panel B: Alternative Inside Debt Specification

	DV ConformTax	DV GaapETR	DV LRgaapETR	DV cashETR	DV LRcashETR	DV Log_UTB_cy	DV Log_UTB_bal	DV ShelterScore
Delta	-0.001***	-0.006***	-0.006***	0.006**	0.002	0.038***	0.019	0.006***
	(0.000)	(0.006)	(0.001)	(0.019)	(0.338)	(0.004)	(0.227)	(0.001)
Vega	0.000	0.001	0.000	-0.001	-0.002*	-0.005	0.028**	-0.001
	(0.538)	(0.462)	(0.944)	(0.629)	(0.074)	(0.647)	(0.016)	(0.255)
DE_Ratio	-0.002***	-0.004**	-0.004***	-0.004*	-0.004*	0.016	0.002	0.003**
	(0.000)	(0.038)	(0.009)	(0.073)	(0.051)	(0.350)	(0.936)	(0.016)
Ccomp	0.001	-0.006	-0.003	0.009	0.004	-0.046	0.038	0.009*
	(0.404)	(0.307)	(0.591)	(0.100)	(0.470)	(0.282)	(0.390)	(0.067)
ManagerialAbility	-0.016***	-0.010	-0.025**	0.018	0.000	0.509***	0.404**	0.029*
	(0.000)	(0.513)	(0.039)	(0.336)	(0.997)	(0.000)	(0.011)	(0.054)
Age	0.000	-0.000	-0.000	-0.000	-0.000	-0.001	-0.006*	-0.000
	(0.643)	(0.957)	(0.773)	(0.536)	(0.315)	(0.631)	(0.076)	(0.265)
Tenure	0.000	-0.000	0.000	-0.001**	-0.000	-0.004	-0.008	-0.000
	(0.873)	(0.798)	(0.969)	(0.023)	(0.555)	(0.400)	(0.126)	(0.719)
Female	0.000	-0.002	0.005	-0.001	-0.002	-0.004	-0.060	-0.004
	(0.928)	(0.854)	(0.585)	(0.964)	(0.851)	(0.970)	(0.628)	(0.699)
R_D	0.043***	0.393***	0.283***	0.342***	0.374***	2.630***	3.724***	-0.454***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Adv	-0.015	0.105	0.047	-0.041	-0.028	1.951**	0.847	-0.006
	(0.514)	(0.180)	(0.524)	(0.665)	(0.741)	(0.010)	(0.345)	(0.944)
Capex	-0.004	-0.066*	-0.052*	0.022	0.068*	0.167	-1.138***	0.049
	(0.448)	(0.061)	(0.052)	(0.608)	(0.069)	(0.418)	(0.000)	(0.116)

Table 5. Panel B - Continued

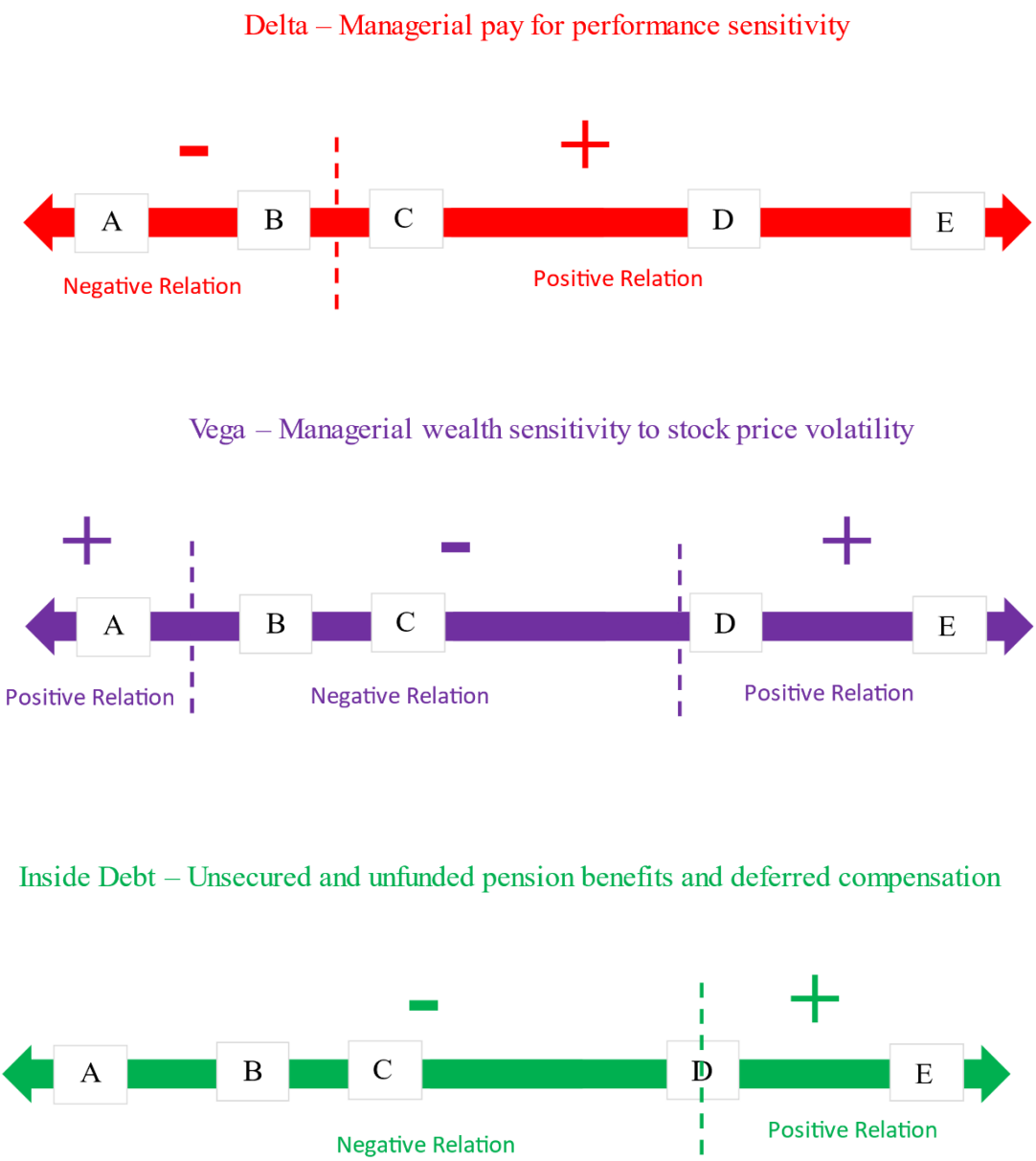
Int_Exp	0.152***	0.396	0.545**	1.219***	0.805***	0.119	8.348***	-0.361
	(0.001)	(0.182)	(0.029)	(0.000)	(0.006)	(0.942)	(0.000)	(0.196)
Foreign	-0.000	0.004	0.005	-0.016**	-0.015**	0.074	0.293***	0.016**
	(0.784)	(0.435)	(0.312)	(0.030)	(0.030)	(0.134)	(0.000)	(0.038)
EBIT	-0.011***	-0.024***	-0.026***	0.024***	0.008	0.102**	0.004	0.037**
	(0.000)	(0.004)	(0.000)	(0.004)	(0.292)	(0.012)	(0.945)	(0.023)
NOL	-0.003	0.009**	0.008**	0.024***	0.020***	-0.020	0.049	0.001
	(0.137)	(0.023)	(0.017)	(0.000)	(0.000)	(0.607)	(0.261)	(0.651)
SG_A	-0.018***	-0.010	0.000	-0.042**	-0.055***	0.467***	0.767***	-0.116***
	(0.000)	(0.535)	(0.984)	(0.050)	(0.005)	(0.000)	(0.000)	(0.000)
Intangibles	-0.002	0.033***	0.011	-0.009	-0.003	-0.026	-0.071	0.037***
	(0.204)	(0.002)	(0.230)	(0.438)	(0.741)	(0.718)	(0.426)	(0.000)
Size	0.000	0.013***	0.013***	-0.003	0.002	0.705***	1.029***	0.012***
	(0.449)	(0.000)	(0.000)	(0.246)	(0.467)	(0.000)	(0.000)	(0.000)
Leverage	-0.008**	0.002	-0.009	-0.007	0.011	-0.364**	-0.517***	0.013
	(0.021)	(0.935)	(0.607)	(0.752)	(0.568)	(0.011)	(0.003)	(0.490)
S_P	-0.002	-0.021*	-0.019**	-0.023*	-0.029***	-0.002	0.117	-0.010
	(0.062)	(0.065)	(0.008)	(0.025)	(0.982)	(0.230)	(0.318)	(0.289)
Constant	0.007	-0.263***	-0.334***	-0.353***	-0.276***	-4.322***	-5.223***	0.839***
	(0.488)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	5,594	10,505	9,356	10,393	9,185	10,576	10,738	9,134
R-squared	0.165	0.095	0.251	0.122	0.222	0.606	0.737	0.313
adj-R2	0.149	0.0741	0.231	0.101	0.201	0.597	0.731	0.295

This table presents the results of OLS regressions of firms' tax avoidance proxies on CEO compensation packages (Delta, Vega, Inside Debt/DE_Ratio) and controls from 2007 to 2017 with year and three digit SIC fixed effects with clustering by firm. Variable definitions are provided in Appendix A. Robust pval in parentheses. *, **, and *** indicate statistical significance at p<0.1, 0.05 and 0.01 respectively.

impacts long-term risky tax planning as measured by *Log_UTB_bal*, while *Delta* impacts short-term efforts. These results agree with Powers et al. (2016) who also find that UTB balances are positively related to *Vega*, but not *Delta*.

InsideDebt's only negatively association is with *ConformTax*. The alternative specification of Inside Debt, *DE_Ratio*, is negatively associated with all forms of tax avoidance except for the UTB measures and *ShelterScore*. *DE_Ratio* is similar to *Delta* in that it is a potentially versatile tool for corporate boards to influence a vast range of tax avoidance proxies. This indicates that the CEO's total inside debt is less indicative of tax strategy than the extent to which the CEO's debt-to-equity ratio mirrors the firm's debt-to-equity ratio.

Figure 4: Visual illustration of positive and negative relations



[A] Conforming Tax Avoidance
[B] GAAP ETR
[C] Cash ETR
[E] Reportable Transactions
[D] Uncertain Tax Benefits

Figure 4 is a visual illustration of where certain forms of compensation are positively or negatively associated with tax avoidance. *Delta* is negatively associated with conservative forms of tax avoidance such as conforming tax avoidance and GAAP effective tax rates. *Delta* is positively associated with more aggressive forms of tax avoidance. *Vega*, while featuring fewer significant associations, exhibits signs of positive associations on the extreme conservative and aggressive end of the tax avoidance spectrum and negative association with moderate forms of tax avoidance. Inside debt is negatively associated with conservative and moderate forms of tax avoidance and positively associated with reportable transactions, the most aggressive form of tax avoidance.

As a final analysis, I rank each significant association based on economic impact. I measure economic impact as the change in tax avoidance per one standard deviation change in executive compensation. For example, *ConformTax* is significantly associated with *Delta*, *Vega* and both specifications of inside debt. I measure how much *ConformTax* changes per one standard deviation change in *Delta*, *Vega*, *InsideDebt*, and *DE_Ratio*. Table 7 reports the economic impact in descending order. Changing *DE_Ratio* has the largest economic impact on *ConformTax* followed by *Delta*, *Vega*, and then *InsideDebt*. *Delta* has the largest economic impact on *ShelterScore* followed by both *DE_Ratio* and *InsideDebt*. Results suggest that *DE_Ratio* and *Delta* have the most significant economic effect on tax strategies.

Table 7. Compensation incentives ranked by economic impact

	Conforming Tax Avoidance	GaapETR	Long-Run GaapETR	CashETR	Long-Run CashETR	UTB balance	UTB additions	Reportable Transactions
Largest Impact	- DE_Ratio	- DE_Ratio	- DE_Ratio	- DE_Ratio	- DE_Ratio	+ Vega	+ Delta	+ Delta
2nd Largest	- Delta	- Delta	- Delta	+ Delta	- Vega			+ DE_Ratio
3rd Largest	+ Vega							+ InsideDebt
4th Largest	- InsideDebt							

Tax avoidance proxies are listed from least aggressive to most aggressive left to right. Compensation incentives are listed in descending order based on magnitude of economic significance. Variable definitions are provided in Appendix A.

Bonus Compensation

In order to test H4, which predicts a negative association between conforming tax avoidance and bonus compensation and a positive association between bonus compensation and aggressive forms of tax avoidance, I conduct a series of tests. Specifically, I investigate the relationship between bonus compensation and tax avoidance and compare bonus compensation to other forms of executive compensation.

Gaertner (2014) finds a significant positive association between bonus compensation based on after-tax performance metrics and tax avoidance. However, subsequent studies using larger samples have produced less compelling evidence. For instance, Powers et al. (2016), which used the largest sample size to date, find that bonus compensation based on cash flow metrics is significantly associated with tax avoidance, but fail to find a significant association using bonus compensation based on after-tax performance metrics. To replicate and extend this analysis, I collect bonus compensation data, along with the performance metrics, from ISS Incentive Labs for the years 2007-2017. Restricting observations to firm years with bonus performance metrics leaves 13,452 firm-year observations. I further restrict the sample to only those observations where a CEO received the bonus to remove any confounding effects of bonus metrics that executives were not striving to achieve, leaving me with 11,335 firm-year observations. After removing observations missing control variables and the other measures of executive compensation leaves me with 5,888 observations.

I compute two performance metrics, *CF_Bonus* when the cash bonus is based on cash flow performance (*CF_Bonus* = 1) and *AfterTax* when the cash bonus is based on after-tax performance metrics (*AfterTax* = 1), similar to Powers et al. (2016). The *AfterTax* sample was further restricted

by dropping firm-years without observations related to earnings as well as observations where the metric is too vague to be classified.

Table 8. Subsample Selection

Panel A: Sample Distribution

	Number of Observations
Intersection of Execucomp, Compustat, and ISS Incentive Labs	13,452
Remove observations without a CEO	(1,287)
Remove observations where no bonus was paid	(830)
Remove observations with missing control variables	(4,553)
Remove observations missing other forms of compensation	(894)
Total sample before tax avoidance measures	5,888

Panel B: Final Sample

Using Conforming Tax Avoidance	2,682
Using GAAP ETR	5,317
Using Long-Run GAAP ETR	4,881
Using Cash ETR	5,257
Using Long-Run Cash ETR	4,803
Using UTB Additions	5,329
Using UTB Ending Balance	5,399
Using Reportable Transactions	4,801

Notes: This table summarizes the sample selection procedure for this study. Sample extends from fiscal year 2007 through 2017.

Table 8 illustrates the sample selection process, while Tables 9 presents the results of the analysis. I find that *CF_Bonus* is positively associated with every measure of tax avoidance, except for *ShelterScore* and the UTB measures. This suggests that basing bonus compensation on cash flow performance metrics is associated with an increase in each type of tax avoidance, except for the most aggressive measures of tax avoidance. This positive association agrees with Powers et al. (2016), who find similar results using cash flow bonuses. Untabulated tests fail to find a relationship between *AfterTax* and any measure of tax avoidance which also agrees with Powers Et al. (2016). These findings suggest that the type of performance metric used in bonus compensation matters when it comes to its association with tax avoidance.

Table 9. Tax avoidance and bonus compensation

	DV ConformTax	DV GaapETR	DV LRgaapETR	DV CashETR	DV LRcashETR	DV Log_UTB_cy	DV Log_UTB_bal	DV ShelterScore
CF_Bonus	0.004***	0.020***	0.020***	0.023***	0.021***	0.072	0.079	0.000
	(0.003)	(0.005)	(0.000)	(0.003)	(0.003)	(0.252)	(0.222)	(0.837)
Ccomp	0.001	-0.015	-0.005	0.012	0.000	0.034	0.228***	0.003
	(0.348)	(0.151)	(0.510)	(0.305)	(0.996)	(0.679)	(0.006)	(0.243)
ManagerialAbility	-0.013***	-0.014	-0.021	0.025	0.007	0.556***	0.411*	0.007
	(0.004)	(0.453)	(0.142)	(0.303)	(0.740)	(0.002)	(0.056)	(0.372)
Age	-0.000	0.000	0.000	-0.000	0.000	-0.005	-0.010**	-0.000
	(0.167)	(0.773)	(0.461)	(0.954)	(0.997)	(0.239)	(0.048)	(0.305)
Tenure	-0.000	-0.000	-0.001	-0.001**	-0.001	0.003	-0.006	0.000*
	(0.112)	(0.743)	(0.284)	(0.049)	(0.271)	(0.683)	(0.351)	(0.086)
Female	0.001	0.005	0.013	0.002	-0.006	0.087	0.043	0.001
	(0.668)	(0.726)	(0.239)	(0.902)	(0.596)	(0.549)	(0.802)	(0.525)
R_D	0.064***	0.406***	0.334***	0.479***	0.444***	3.916***	4.090***	-0.150*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.098)
Adv	-0.054*	0.212*	0.191	0.102	-0.003	2.254*	-0.225	0.024
	(0.086)	(0.083)	(0.131)	(0.465)	(0.982)	(0.080)	(0.872)	(0.508)
Capex	0.002	-0.127**	-0.090**	0.113*	0.165***	0.290	-1.825***	-0.025
	(0.864)	(0.018)	(0.029)	(0.090)	(0.005)	(0.482)	(0.000)	(0.376)
Int_Exp	0.222***	0.491	0.689*	0.151	-0.081	-0.662	9.232***	-0.189
	(0.003)	(0.285)	(0.054)	(0.767)	(0.843)	(0.827)	(0.006)	(0.284)
Foreign	0.004***	0.020***	0.020***	0.023***	0.021***	0.072	0.079	0.000
	(0.003)	(0.005)	(0.000)	(0.003)	(0.003)	(0.252)	(0.222)	(0.837)

Table 9 - Continued

EBIT	-0.015***	-0.028**	-0.027***	0.030**	0.005	0.417***	0.215**	0.017
	(0.000)	(0.031)	(0.008)	(0.040)	(0.688)	(0.000)	(0.046)	(0.192)
NOL	-0.005	0.011*	0.004	0.012*	0.010	-0.015	0.006	0.000
	(0.182)	(0.056)	(0.420)	(0.090)	(0.109)	(0.817)	(0.921)	(0.846)
SG_A	-0.022***	-0.030	-0.024	-0.082**	-0.072**	0.511**	0.928***	-0.017
	(0.000)	(0.292)	(0.267)	(0.023)	(0.016)	(0.027)	(0.001)	(0.436)
Intangibles	-0.002	0.038**	0.015	-0.006	-0.005	-0.033	-0.150	0.012
	(0.403)	(0.018)	(0.199)	(0.741)	(0.740)	(0.796)	(0.285)	(0.213)
Size	0.001	0.015***	0.013***	-0.004	-0.000	0.847***	1.055***	0.002
	(0.226)	(0.000)	(0.000)	(0.287)	(0.961)	(0.000)	(0.000)	(0.339)
Leverage	-0.004	-0.004	-0.018	0.022	0.030	-0.203	-0.503**	-0.004
	(0.416)	(0.895)	(0.449)	(0.474)	(0.259)	(0.347)	(0.034)	(0.464)
S_P	-0.001	-0.022	-0.008	-0.010	-0.029*	0.049	0.035	-0.004
	(0.674)	(0.143)	(0.521)	(0.619)	(0.084)	(0.739)	(0.832)	(0.360)
Constant	-0.017	-0.356***	-0.430***	-0.334***	-0.268***	-6.095***	-6.724***	0.978***
	(0.172)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	2,682	5,317	4,881	5,257	4,803	5,329	5,399	4,801
R-squared	0.241	0.134	0.350	0.170	0.292	0.592	0.692	0.194
adj-R2	0.211	0.0992	0.322	0.137	0.260	0.575	0.680	0.160

This table presents the results of OLS regressions of firms' tax avoidance proxies on CEO bonus compensation (CF_Bonus) and controls from 2007 to 2017 with year and three digit sic fixed effects with clustering by firm. Variable definitions are provided in Appendix A. Robust pval in parentheses. *, **, and *** indicate statistical significance at p<0.1, 0.05 and 0.01 respectively.

Moving on to the comparison of bonus compensation to other forms of executive compensation, I restrict the analysis to the dependent variables that are significantly associated with bonus compensation. Table 10 details the results of equation 4 including bonus compensation. I find that *Delta* is significantly associated with each form of tax avoidance after including *CF_Bonus* and using the restricted sample. *Delta* is negatively associated with the most conservative forms of tax avoidance, such as *ConformTax* and *GaapETR*, and positively associated with the more aggressive forms of tax avoidance, such as *CashETR*. *Vega* loses significance for *ConformTax*[10] but maintains significance with *CashETR*. Furthermore, *DE_Ratio* maintains a significant negative association with each form of tax avoidance. *CF_Bonus* maintains its significance with each measure of tax avoidance after including the other forms of compensation.

H4 predicts a negative relation between bonus compensation and conforming tax avoidance and a positive relation between bonus compensation and other forms of tax avoidance. Contrary to H4, I find that basing bonus compensation on cash flow performance metrics exhibits a positive association with conforming tax avoidance despite conforming tax avoidance temporarily decreasing book income. This suggests that cashflow-based bonus compensation consistently encourages tax avoidance despite the short term effects on book income.

[10] Untabulated additional analysis reveal that *Vega* loses its significant relationship with *ConformTax* due to the decreased sample size and not the inclusion of *CF_Bonus*.

Table 10 – Tax Avoidance and all forms of compensation including bonus

VARIABLES	DV ConformTax	DV GaapETR	DV LRgaapETR	DV CashETR	DV LRcashETR
Delta	-0.001*	-0.004*	-0.005**	0.006**	0.004*
	(0.054)	(0.092)	(0.029)	(0.038)	(0.093)
Vega	0.000	0.000	0.000	-0.004**	-0.004***
	(0.414)	(0.474)	(0.458)	(0.023)	(0.003)
DE_Ratio	-0.002***	-0.007**	-0.007***	-0.009***	-0.007***
	(0.002)	(0.011)	(0.003)	(0.007)	(0.009)
CF_Bonus	0.004***	0.020***	0.020***	0.024***	0.021***
	(0.002)	(0.003)	(0.000)	(0.001)	(0.001)
Ccomp	0.002	-0.015	-0.005	0.013	0.001
	(0.230)	(0.146)	(0.495)	(0.248)	(0.878)
ManagerialAbility	-0.012***	-0.014	-0.021	0.022	0.005
	(0.006)	(0.466)	(0.141)	(0.347)	(0.809)
Age	-0.000	0.000	0.000	0.000	0.000
	(0.320)	(0.555)	(0.274)	(0.840)	(0.816)
Tenure	-0.000	0.000	0.000	-0.002**	-0.001
	(0.647)	(0.563)	(0.833)	(0.018)	(0.182)
Female	0.001	0.003	0.011	0.000	-0.008
	(0.702)	(0.844)	(0.340)	(0.978)	(0.482)
R_D	0.066***	0.410***	0.340***	0.464***	0.434***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adv	-0.057*	0.205*	0.187	0.089	-0.013
	(0.064)	(0.092)	(0.131)	(0.514)	(0.919)
Capex	0.003	-0.118**	-0.080*	0.080	0.140**
	(0.713)	(0.028)	(0.056)	(0.241)	(0.019)
Int_Exp	0.223***	0.453	0.653*	0.101	-0.162
	(0.003)	(0.322)	(0.067)	(0.843)	(0.692)
Foreign	0.001	0.004	0.002	-0.013	-0.011
	(0.646)	(0.597)	(0.761)	(0.207)	(0.269)
EBIT	-0.014***	-0.023*	-0.023**	0.030**	0.005
	(0.000)	(0.066)	(0.023)	(0.035)	(0.667)
NOL	-0.005	0.010*	0.003	0.011	0.010
	(0.115)	(0.072)	(0.489)	(0.103)	(0.120)
SG_A	-0.022***	-0.023	-0.017	-0.075**	-0.063**
	(0.000)	(0.431)	(0.448)	(0.040)	(0.038)

Table 10 - Continued

Intangibles	-0.002	0.037**	0.014	-0.011	-0.009
	(0.330)	(0.023)	(0.251)	(0.538)	(0.587)
Size	0.001*	0.017***	0.016***	-0.004	0.001
	(0.086)	(0.000)	(0.000)	(0.315)	(0.804)
Leverage	-0.008	-0.015	-0.029	0.011	0.022
	(0.143)	(0.631)	(0.224)	(0.725)	(0.405)
S_P	-0.001	-0.023	-0.010	-0.008	-0.028*
	(0.634)	(0.125)	(0.444)	(0.696)	(0.089)
Constant	-0.017	-0.347***	-0.420***	-0.356***	-0.283***
	(0.199)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	2,682	5,317	4,881	5,257	4,803
R-squared	0.249	0.136	0.355	0.174	0.298
adj-R2	0.218	0.100	0.326	0.140	0.266

This table presents the results of OLS regressions of firms' tax avoidance proxies on CEO executive compensation and controls from 2007 to 2017 with year and three digit sic fixed effects with clustering by firm. Variable definitions are provided in Appendix A. Robust pval for one-tail tests using the executive compensation and two-tail tests for the control variables are reported in parentheses. *, **, and *** indicate statistical significance at p<0.1, 0.05 and 0.01 respectively.

Lastly, the economic effect of bonus compensation is compared to other forms of executive compensation, using adjusted R-squared as a measure of explanatory power. I compare the increase in the adjusted R-squared over the baseline model for each form of executive compensation in Table 11. The baseline model includes control variables estimated using ordinary least squares with year and industry fixed effects, and robust standard errors clustered by firm.

The results reveal that *CF_Bonus* exhibits the largest increase in explanatory power for each measure of tax avoidance, except for *ConformTax*, where it features the same increase in explanatory power as *DE_Ratio*. This finding is noteworthy because bonus compensation is not typically included as a control variable for managers' incentives for

tax planning. Corporate boards seeking to understand the association between executive compensation and tax avoidance should therefore take note of the impact of basing bonus compensation on cash flow performance metrics.

Moreover, the ratio of the executive's inside debt to the firm's inside debt (*DE_Ratio*) demonstrates significantly more explanatory power than the executive's inside debt alone (*InsideDebt*). When all forms of executive compensation are considered together, I observe a larger increase in explanatory power for *ConformTax* compared to the measures of effective tax rates. Finally, the adjusted R-squared for long-run measures of effective tax rates are significantly higher than the one-year measures. Overall, these findings provide insights for corporate decision-makers and suggest that the use of bonus compensation as a tool to encourage tax planning may be more effective than previously recognized.

Table 11: Explanatory power of executive compensation

Dependent Variable	(A) ConformTax	(B) GaapETR	(C) LRgaapETR	(D) CashETR	(E) LRcashETR
Baseline model with control variables					
Adjusted R-squared	0.205	0.097	0.317	0.134	0.256
Observations	2,682	5,317	4,881	5,257	4,803
Incremental Significance of Delta					
Δ in Adjusted R-squared	0.488%	1.031%	0.631%	0.000%	0.000%
Incremental Significance of Vega					
Δ in Adjusted R-squared	0.000%	0.000%	0.000%	0.000%	0.781%
Incremental Significance of Inside_Debt					
Δ in Adjusted R-squared	1.463%	0.000%	0.000%	0.000%	0.391%
Incremental Significance of DE_Ratio					
Δ in Adjusted R-squared	2.927%	1.031%	0.631%	1.493%	1.172%
Incremental Significance of CF_Bonus					
Δ in Adjusted R-squared	2.927%	2.062%	1.577%	2.239%	1.563%
Significance using Delta, Vega, DE_Ratio CF_Bonus					
Δ in Adjusted R-squared	6.341%	3.093%	2.839%	4.478%	3.906%

This table displays the results from testing the incremental significance of Delta, Vega, Inside Debt, and bonus compensation over the baseline model of control variables. All models are estimated using OLS with year and industry fixed effects and robust standard errors clustered by firm. Incremental significance is measured as the percentage increase in Adjusted R-squared. Variable definitions are provided in Appendix A.

CHAPTER VI

CONCLUSION

In this study, I examine the association between different forms of executive compensation and different types of tax avoidance. I split tax avoidance into different proxies explaining a range of tax avoidance from the more conservative approaches to the most aggressive methods. I find that managerial pay for performance sensitivity, delta, is the most versatile form of compensation for encouraging or discouraging tax avoidance. Delta is negatively associated with conservative tax avoidance strategies and positively associated with aggressive tax avoidance strategies. While managerial wealth sensitivity to stock volatility, vega, is most often cited as the tool for aligning managerial risk preferences, I find that inside debt has the most reliable association with CEO risk preferences for tax avoidance. I find that the debt-to-equity holdings of the executive is a more powerful predictor of tax avoidance than total CEO inside debt holdings. I also find where along

the tax avoidance spectrum delta, vega, and inside debt switch from encouraging tax avoidance to discouraging tax avoidance.

I also find evidence that bonuses based on cash flow performance metrics is the form of executive compensation most strongly associated with less aggressive forms of corporate tax avoidance. Despite being the form of compensation that explains the greatest

in less aggressive forms of corporate tax avoidance, bonuses do no explain variation on the aggressive end of the corporate tax avoidance spectrum. This makes bonuses a powerful tool for predicting certain types of tax avoidance.

I create a holistic guide as to which compensation packages are most associated with which types of tax avoidance. I find that many compensation packages discourage some types of tax avoidance while encouraging other types of tax avoidance. I delineate where along the tax avoidance spectrum certain compensation packages incentivize tax avoidance strategies. I also rank which forms of executive compensation have the greatest impact on each type of tax avoidance. Researchers and corporate boards can use this information to understand potential tax effects of the different components of compensation packages. egin typing or pasting the rest of your chapter 1 text here.

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REFERENCES

Armstrong, C. S., J. L. Blouin, A. D. Jagolinzer, and D. F. Larcker. 2015. Corporate governance, incentives, and tax avoidance. *Journal of Accounting and Economics* 60 (1):1-17.

Badertscher, B. A., S. P. Katz, S. O. Rego, and R. J. Wilson. 2019. Conforming Tax Avoidance and Capital Market Pressure. *The Accounting Review* 94 (6):1-30.

Blouin, J. 2014. DEFINING AND MEASURING TAX PLANNING AGGRESSIVENESS. *National Tax Journal* 67 (4):875-899.

Bozanic, Z., J. L. Hoopes, J. R. Thornock, and B. M. Williams. 2017. IRS Attention. *Journal of Accounting Research* 55 (1):79-114.

Brown, J. L., K. D. Drake, and M. A. Martin. 2016. Compensation in the Post-FIN 48 Period: The Case of Contracting on Tax Performance and Uncertainty. *Contemporary Accounting Research* 33 (1):121-151.

Chi, S., S. X. Huang, and J. M. Sanchez. 2017. CEO Inside Debt Incentives and Corporate Tax Sheltering. *Journal of Accounting Research* 55 (4):837-876.

Chyz, J. A., F. B. Gaertner, A. Kausar, and L. Watson. 2019. Overconfidence and Corporate Tax Policy. *Review of Accounting Studies* 24 (3):1114-1145.

Coles, J., N. Daniel, and L. Naveen. 2006. Managerial incentives and risk-taking☆. *Journal of Financial Economics* 79 (2):431-468.

Core, J., and W. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* 28 (2):151-184.

Demerjian, P., B. Lev, and S. McVay. 2012. Quantifying Managerial Ability: A New Measure and Validity Tests. *Management Science* 58 (7):1229-1248.

Desai, M. A., and D. Dharmapala. 2006. Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics* 79 (1):145-179.

Dyreng, S. D., M. Hanlon, and E. L. Maydew. 2008. Long-Run Corporate Tax Avoidance. *The Accounting Review* 83 (1):61-82.

Fama, E. F., and M. C. Jensen. 1983. Agency Problems and Residual Claims. *The Journal of Law and Economics* 26 (2):327-349.

Fu, F. 2009. Idiosyncratic risk and the cross-section of expected stock returns. *Journal of Financial Economics* 91 (1):24-37.

Gaertner, F. B. 2014. CEO After-Tax Compensation Incentives and Corporate Tax Avoidance. *Contemporary Accounting Research* 31 (4):1077-1102.
Guay, W. R. 1999. The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. *Journal of Financial Economics* 53 (1):43-71.
Hanlon, M., and S. Heitzman. 2010. A review of tax research. *Journal of Accounting and Economics* 50 (2-3):127-178.
Hsu, P.-H., J. A. Moore, and D. O. Neubaum. 2018. Tax avoidance, financial experts on the audit committee, and business strategy. *Journal of Business Finance & Accounting* 45 (9-10):1293-1321.
Jensen, M., and W. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics* 3 (4):305-369.
Jo, H., and H. Na. 2012. Does CSR Reduce Firm Risk? Evidence from Controversial Industry Sectors. *Journal of Business Ethics* 110 (4):441-456.
Kara, M., M. Michael, and R. Scott. 2022. Equity incentives and conforming tax avoidance. *Working Paper*.
Klassen, K. J., P. Lisowsky, and D. Mescall. 2016. The Role of Auditors, Non-Auditors, and Internal Tax Departments in Corporate Tax Aggressiveness. *The Accounting Review* 91 (1):179-205.
Kubick, T. R., G. B. Lockhart, and J. R. Robinson. 2020. DOES INSIDE DEBT MODERATE CORPORATE TAX AVOIDANCE? *National Tax Journal* 73 (1):47-76.
Lisowsky, P. 2010. Seeking Shelter: Empirically Modeling Tax Shelters Using Financial Statement Information. *The Accounting Review* 85 (5):1693-1720.
Lisowsky, P., L. Robinson, and A. Schmidt. 2013. Do Publicly Disclosed Tax Reserves Tell Us About Privately Disclosed Tax Shelter Activity? *Journal of Accounting Research* 51 (3):583-629.
Minnick, K., and T. Noga. 2010. Do corporate governance characteristics influence tax management? *Journal of Corporate Finance* 16 (5):703-718.
Powers, K., J. R. Robinson, and B. Stomberg. 2016. How do CEO incentives affect corporate tax planning and financial reporting of income taxes? *Review of Accounting Studies* 21 (2):672-710.
Rego, S. O., and R. Wilson. 2012. Equity Risk Incentives and Corporate Tax Aggressiveness. *Journal of Accounting Research* 50 (3):775-810.
Robinson, J. R., Xue, Y., Zhang. M.H. 2012. Tax planning and financial expertise in the audit committee.
Ross, S. A., R. Westerfield, B. D. Jordan, and E. N. Biktimirov. 2008. *Essentials of corporate finance*: McGraw-Hill/Irwin.
Towery, E. M. 2017. Unintended Consequences of Linking Tax Return Disclosures to Financial Reporting for Income Taxes: Evidence from Schedule UTP. *The Accounting Review* 92 (5):201-226.
Treasury, U. S. D. o. t. 1999. The Problem of Corporate Tax Shelters: Discussion, Analysis and Legislateive Proposals. Washington, D.C.: Govenment Printing Office.
Wei, C., and D. Yermack. 2011. Investor Reactions to CEOs' Inside Debt Incentives. *Review of Financial Studies* 24 (11):3813-3840.

Wilson, R. J. 2009. An Examination of Corporate Tax Shelter Participants. *The Accounting Review* 84 (3):969-999.

APPENDICES

Primary Variables:	
ConformTax	A measure of conforming tax avoidance per Badertscher et al. (2019) calculated as the residual from this equation: taxes paid (TXPD/beginning assets) = $\beta_0 + \beta_1$BTD + β_2NEG + β_3BTD*NEG + β_4NOL + $\beta_5\Delta$NOL + ε where: • BTD is domestic financial income minus federal, state, and other income taxes divided by the statutory rate adjusted for net operating loss scaled by beginning assets (btd = [PI-[(TXT-TXDI-TXS-TXO)/0.35]-ΔTLCF]/lagged AT • NEG is an indicator equal to 1 when BTD is less than zero • NOL is in indicator equal to 1 when there is a current net operating loss (TLCF) at the beginning of the year • ΔNOL is the change in beginning of year current net operating loss (TLCF) from the previous year Final values are multiplied by negative one
GaapETR	Taxes paid (TXT) divided by the difference between pretax income (PI) and special items (SPI). Observations with negative denominators are coded to missing and values are winsorized to be between 0 and 1. Final values are multiplied by negative one
LRgaapETR	Three year running average of GaapETR
CashETR	Taxes paid (TXPD) divided by the difference between pretax income (PI) and special items (SPI). Observations with negative denominators are coded to missing and values are winsorized to be between 0 and 1. Final values are multiplied by negative one
LRcashETR	Three year running average of CashETR

Log_UTB_cy	Uncertain tax benefit increase (TXTUBPOSINC) less the uncertain tax benefit decrease (TXTUBPOSDEC) scaled by beginning of year assets
Log_UTB_bal	Year-end uncertain tax benefit balance (TXTUBEND) scaled by beginning of year assets
ShelterScore	Tax shelter prediction score from Lisowsky (2010): *Shelter* = -7.059 + 0.032 *x BTD* + 0.924 *x DAP* - 0.697 *x Leverage* + 1.397 *x Size* + 2.473 *x ROA* + 3.569 *x Foreign* - 3.023 *x R&D* + 0.790 *x TaxHav* + 0.015 *x LagETR* + 1.048 *x EqEarn* - 0.687 *x MezzFin* + 3.186 *x Big5* + 1.063 *x Litigation* + 0.140 *x NOL* where: • BTD is domestic financial income minus federal, state, and other income taxes divided by the statutory rate adjusted for net operating loss scaled by beginning assets (btd = [PI-[(TXT-TXDI-TXS-TXO)/0.35]-change in TLCF]/lagged AT • DAP is performance-adjusted discretionary accruals from the performance-adjusted modified cross-sectional jones (1991) model • Leverage is long-term debt (DLTT) scaled by beginning assets • Size is the natural log of total assets (AT) • ROA is pretax income (PI) scaled by beginning assets • Foreign is an indicator variable equal to one when there is foreign pretax income (PIFO) • R&D is research and development expense (XRD) scaled by beginning assets
InsideDebt	CEO inside debt scaled by beginning of year total assets where inside debt is the sum of the present value of accumulated pension (PENSION_VALUE_TOT) and deferred compensation (DEFER_BALANCE_TOT)
DE_Ratio	The natural log of one plus the CEO-firm inside debt where the CEO-firm inside debt is CEO debt compensation divided by equity compensation scaled by the firm's debt-to-equity ratio DEcf = ln(1+ [(Debtat/accumulated equity)/(DLTT + DLC)/(CSHO *x* PRCC_F)])
Delta	The natural log of one plus CEO pay-for-performance sensitivity per Coles et al. (2006)
Vega	The natural log of one plus CEO equity risk incentives per Coles et al. (2006)
AfterTax	An indicator variable equal to one of the CEO's bonus was based on performance metrics measuring after-tax income

CF_Bonus	An indicator variable equal to one if the CEO's bonus was based on performance metrics measuring cash flow
Executive Controls:	
Age	The natural log of CEO age (AGE)
Tenure	The natural log of CEO tenure where tenure is the number of years the CEO has been CEO
Female	An indicator variable equal to one if the CEO is female
ManagerialAbility	Score of managerial ability from Peter Demerjian's website: https://peterdemerjian.weebly.com/managerialability.html
Firm Controls:	
R_D	Research and development expense (XRD) scaled by beginning assets. Missing values are replaced with zero.
Adv	Advertising expense (XAD) scaled by beginning assets. Missing values are replaced with zero.
Capex	Capital expenditures (CAPX) scaled by beginning assets
Ccomp	The natural log of CEO cash compensation (TOTAL_CURR)
Int_Exp	Interest expense (XINT) scaled by beginning assets
Foreign	Indicator whenever there is foreign income (PIFO)
EBIT	Ratio of earnings before interest and taxes (EBIT) scaled by net operating assets where net operating assets are calculated as SEQ - CHE + XINT + DLC + DLTT
NOL	An indicator variable equal to one if a firm has non-zero and non-missing net operating loss carryforwards (TLCF)
SG_A	Selling general and administrative expense (XSGA) scaled by beginning assets. Missing values are replaced with zero.
Intangibles	Intangible assets (INTAN) scaled by beginning assets where INTAN is replaced with GDWL when missing INTAN. Remaining missing values are replaced with zero.
Size	The natural log of beginning assets
Leverage	Total firm debt (DLC + DLTT) scaled by total assets (AT)
S_P	An indicator variable equal to one if a firm has a ranking from the S&P Global Market Intelligence quality ranking (SPCSRC)

Notes: This appendix describes the measurement of each variable in the analysis. I obtain firm-year accounting data from Compustat Fundamentals Annual. Executive information is retrieved from Execucomp. Security-level return and volume data comes from CRSP files. Any other data sources are specifically identified in the variable definition.

VITA

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