

The Incentives for Tax Planning

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Abstract: In this paper, we examine the role of the tax director in firms' tax planning. We use a proprietary data set with detailed executive compensation to examine the relation between the incentives of the tax director and the book-tax gap, financial and cash effective tax rates, and measures of tax aggressiveness. We find that the incentives of the tax director exhibit a strong negative relation with the financial effective tax rate, but little relation with the other tax attributes. We interpret these results as indicating that tax directors are provided with incentives to generate a favorable impact to the financial statements.

Keywords: tax director incentives; effective tax rate; book-tax difference

JEL Classification: H25, M41, M52

The Incentives for Tax Planning

1. Introduction

In this paper, we investigate the role of the tax director in firms' tax planning. Using tax director compensation data, we infer whether the incentives provided to tax directors are associated with wider book-tax gaps (pre-tax measures) and/or lower effective tax rates (after-tax measures). Furthermore, we infer whether incentives are more linked to measures of the impact of taxes on cash flows (taxable income and/or cash effective tax rates) or earnings (pre-tax book income and/or financial effective tax rates).

Our study complements and extends the recent literature that links tax planning with top executive compensation (e.g., Desai and Dharmapala, 2006) and executive/corporate culture (e.g., Frank et al, 2009; Dyreng et al, 2007; Rego and Wilson, 2008).¹ Although these studies have shown that both corporate culture and the incentives of top management have a significant impact on the investing, financing, and operating decisions of the firm, it is not clear whether top management is directly responsible for their firm's tax planning. For example, the focus of non-tax executives may be on the profitability produced by potential investments, as opposed to the impact of investment policy on taxes. Thus, although there may be an observed correlation between top management's incentives and taxes, this result may be an indirect outcome from the investment decision.

On the other hand, it may be that the tax director is nothing more than a puppet of top executives with no ability to effect firm behavior. Therefore, when studying the tax director's incentives we take care to consider the incentives provided other top managers.

¹ This literature suggests that a firm's culture, representing the shared beliefs within the firm regarding the optimal course of action can lead to endemic aggressiveness in all of a firm's business decisions including the tax function (e.g., Cronqvist et al, 2007).

If tax planning is a role merely encompassed in top managements' duties, then we anticipate no association between tax director incentives and measures of tax planning when controlling for the incentives of top management.

To investigate the relative importance of planning for taxes on the income statement vis-à-vis the tax return, we utilize a proprietary data set that includes detailed compensation information for many executives, including the members of the tax department, for a large sample of U.S. firms. This unique data exhibits several advantages relative to prior research. First, it allows us to measure the compensation and incentives of the individual(s) directly responsible for the firms' tax function. Second, the data provides us with information about the compensation and incentives of other members of the management team. This within-firm benchmark sample enables us to identify the attributes of the compensation plan that are unique to tax directors as opposed to the general compensation policy of the firm. Finally, in contrast to prior studies, we do not rely on indirect proxies for tax manager incentives, such as whether tax departments are viewed as "profit centers" (e.g., Robinson et al, 2008).

In this study, we investigate the relation between executive incentives and the various tax attributes of a large sample of firms. We initially examine the book-tax gap as this measure has received considerable attention from the U.S. Treasury, regulators, and academics. We find no evidence that relatively higher tax director compensation is associated with a wider spread between pre-tax book income and taxable income. Since the book-tax gap is defined as the difference between pre-tax financial income and taxable income, there are econometric reasons to disaggregate this variable into its two components (i.e., pre-tax book income and taxable income). In addition, separating the

book-tax gap allows us to look for evidence of conforming tax planning (i.e., where tax planning reduces both book and tax income). The results of this analysis provide no evidence of an association between the incentives provided to tax directors and lower taxable income.

We then shift our focus to the financial and cash effective tax rates (ETRs). Recent research has found evidence that variation in corporate tax planning is captured by ETRs (Dyreng et al, 2007; Robinson et al, 2008). We find a strong negative relation between the incentives of the tax director and the financial effective tax rate. However, we find no relation between tax director incentives and the cash effective tax rate. Moreover, this result is unique to the tax director because we find no evidence that the incentives of the CEO, CFO, and general counsel are associated with measures of tax aggressiveness. This outcome occurs despite the fact that the compensation and incentives of the tax director are very highly correlated with those of the other executives (i.e., compensation policies are similar within firms). Finally, we examine the relation between tax director compensation and two measures developed to explicitly capture tax aggressiveness: a modified version of the DTAX developed by Frank et al (2009) and Wilson's (2009) measure of tax sheltering. We find no evidence that executive compensation and incentives are associated with specific measures of aggressiveness.

Overall, we interpret these results as being consistent with tax directors receiving incentives to generate a favorable impact to the financial statements (i.e., minimize the financial ETR). Although we seem to find that tax directors are not compensated for managing cash taxes, we want to call attention to the fact that our result only suggests that variation in our incentives measure does not capture variation in the cash measures.

It is important to realize that a firm who tax plans using only timing differences and another firm that tax plans using only permanent differences can have the same cash ETRs but will likely have very different financial ETRs. Since survey evidence indicates that tax directors view cash taxes as a relatively important metric, our non-result could be explained by tax directors minimizing cash taxes in order to receive base compensation (and hold their job).²

The remainder of the paper consists of the following seven Sections. Section 2 provides a description of the role of the tax director and Section 3 reviews the prior empirical literature on tax planning. Section 4 describes our proprietary sample. We develop our variable measurement and methodological approach in Section 5. Our results are presented in Section 6 and sensitivity analyses are provided in Section 7. Conclusions and summary comments are provided in Section 8.

2. Role of the Tax Director

We begin our study of tax director incentives by first providing some background regarding their role in the firm. Although tax directors are responsible for one of the firm's largest outflows of cash and expense, we know very little about how these individuals are compensated. Since tax directors are rarely among the five highest compensated executives, information about their annual compensation and equity holdings are not available in annual proxy (Form DEF 14A) filings. Therefore, researchers are unable to directly observe the parameters of tax director incentive pay.

² Assuming that the cash ETR captures aggressive tax planning, an alternate interpretation of our results is that Sarbanes Oxley led firms to cease compensating tax directors for extreme tax aggressiveness.

Anecdotal evidence suggests that there are potentially three roles of the tax director. First, the tax director could merely be responsible for compliance. As multinational firms may be required to file thousands of returns annually, it is not unreasonable to assume that compliance is the tax director's primary duty. Second, the tax director could serve as an advisor to the firm's executive team providing expertise in mitigating the tax cost of the firm's operations or investment. As an advisor, the tax director would be present when strategic investment decisions are made but he/she may not necessarily be responsible for precipitating the investment. Third, the tax director could be charged with actively pursuing tax planning opportunities: the tax director is essentially generating investment opportunities where the NPV of the project is solely the tax benefits. We view this third role (termed the "active planning" role) as relatively more tax aggressive than the advisory role.³ It is likely difficult to empirically disentangle the advisor from the active planner as both roles could yield lower tax obligations. In terms of the compensation contract, agency theory suggests that compensation should be awarded based on performance measures that are controllable by the agent (Holmstrom, 1979). Hence, if the tax director's primary responsibility is compliance, then the incentive component of pay should not be based on cash flow or earnings objectives. On the other hand, tax advisor and active planner compensation should be a function of the firm's financial attributes.

³ Clearly the advisory role also generates NPV for the firm. However, we view the advisor as effectively reducing the tax cost of an incremental investment opportunity (i.e., the NPV of the project includes non-tax components). A tax advisor is typically not going to worry about failing the business purpose test (i.e., there are non-tax benefits to the transaction). Whereas an active planner will have to justify why there are benefits beyond the tax attributes of the transaction (see *Gregory v. Helvering*, 293 U.S. 465 (1935)). As Hanlon and Heitzman (2009) point out, there is no universally accepted definition of tax aggressiveness. So, we are left to make an (albeit coarse) attempt at segregating tax planning from tax aggressiveness for the purposes of our analysis.

To bolster our conjectures regarding the role of the tax director, we turn to the Tax Executive Institute, Inc's (TEI) 2004-2005 Corporate Tax Department Survey, which provides information on several dimensions of the operations of firms' tax departments. This document is the compilation of the responses of approximately 1,300 tax departments (of which, 945 were at publicly traded firms), representing a 57% response rate, to a mid-2004 survey generated by a consulting firm. Although the survey focuses on identifying the specific duties of the tax departments (e.g., time spent on foreign versus domestic compliance, types of entities responsible for, and nexus issues), it does provide descriptive information on the organization of the tax department and some performance metrics of tax department personnel.

The senior tax executives of the public survey respondents typically hold the title of tax director (40%) or vice-president (35%) (described in aggregate hereafter as tax directors) which suggests that these individuals hold high level positions in their respective firms. Sixty-five percent of the tax directors report to the chief financial officer. The majority (60%) of public companies report that their tax function is centralized and globally integrated so the tax director is responsible for taxes world-wide. In terms of specific tasks, the majority of the tax director's time is spent doing research (33%) and compliance (28%).⁴ The average tax director spends 9% of his time on the tax provision and 8% of his time on tax audits. In terms of the average tax department's budget, 60% is allocated towards compensation and 20% towards outside consultants. Finally, tax directors appear involved in the overall operations of the firm as the survey reports that tax directors spend 9% of their time aiding in operational issues (including governance and Sarbanes Oxley compliance) of the firm.

⁴ Note that time on research includes 8.1% of time related to mergers and acquisitions.

The TEI Survey also provides some descriptive information on the performance metrics of a firm's top tax executive. Seventy-one percent of the survey's senior tax executive's of public companies reported that "lack of surprises" was used by senior management to evaluate their performance. Since the effective tax rate (63%) is of slightly more importance than generating cash savings (57%), it appears that income statement surprises could potentially dominate cash flow surprises. Note that the cash savings is not necessarily solely attributable to taxes as only 49% of respondents indicated that they were evaluated on the basis of cash taxes. Interestingly, conversations with tax directors suggested that their primary performance metric was economic value added. However, only 19% of the tax directors surveyed agreed. Finally, the TEI survey reports that only 20% of the incentive compensation of non-tax-director corporate executives was based on after-tax measures.

Our analysis is based on the maintained assumption that the tax director is not the primary instigator of the firm's investment activity. While we believe that the tax director is involved in transaction planning and investment location decisions, we surmise that his role is primarily as an advisor. This conjecture is consistent with the survey evidence documenting that the majority of the tax director's time involves tasks related to return compliance and research. In later tests, we attempt to parse out the advisory role from the active planner role by studying specific measures intended to proxy for aggressive tax planning. To the extent that there is overlap between the duties of tax directors and other senior executives, our analyses should yield similar associations between our measures of tax planning and the incentives of the other executives. As we

discuss below, the statistical differences observed across executive positions is a key feature of our methodological approach.

3. Prior Literature

3.1. Book-Tax Gap

Treasury (1999), Desai (2003) and Boynton et al (2005) all document the growth of the book-tax gap over time. For example, using federal income tax return data, Boynton et al (2005) show that book-tax differences increased tenfold from 1993 to 2003. The growing book-tax gap is consistent with manipulation of earnings reported to the capital markets, tax aggressiveness, or some combination of the two.

Discretion available in generally accepted accounting principles (GAAP) provides managers with an opportunity to manage book earnings upward without necessarily affecting taxable income (e.g., Badertscher et al, 2009). Anecdotal evidence suggests that the ultimate tax planning technique is one which reduces taxable income without effecting book income (see McGill and Outslay, 2004). Similarly, Mills (1998) and Desai (2003) suggest that the expanding book-tax gap appears to be consistent with aggressive tax planning. However, Phillips et al (2003), Hanlon (2005), and Ayers et al (2006) argue that the divide between tax and financial reporting is attributable to earnings management. Finally, both Frank et al (2009) and Phillips et al (2003) find evidence suggesting that firms that manage earnings also aggressively manage taxes.

One major issue with studying the book tax gap is that its growth over time could be attributable to measurement error or to normal business cycles. Desai (2003) adjusts estimates of the book-tax gap for known book-tax differences (e.g., unremitted foreign earnings, excess depreciation and the tax benefit of stock options) and reports that over

half of the adjusted aggregate book-tax difference remains unexplained. However, inferences from this study are likely to be confounded because Desai (2003) uses ExecuComp data to estimate the aggregate tax benefit of options and does not control for book/tax differences in consolidation, effects from tax credits, and net operating losses.

To date, the prior literature has not reached a consensus about the causes of the book-tax gap.⁵ The examination of the link between executive incentives and the book-tax gap can provide new insights into whether firms appear to compensate management in a manner that potentially induces a wider book-tax gap.

3.2. Executive Incentives

Many researchers have argued that the degradation of corporate earnings and taxable income has its genesis in the compensation and incentives provided to management (see Armstrong et al, 2009, for a review). For example, Harris and Bromiley (2007), Efendi et al (2007), and Bergstresser and Phillipon (2006) find that equity-based compensation and holdings provide incentives for managers to manipulate accounting numbers. However, Erickson et al (2006) and Armstrong et al (2009) find no evidence of an association between equity incentives and accounting irregularities. Despite considerable prior research, there is no consensus on whether equity incentives align managers' interests with those of shareholders or whether they instead induce managers to manipulate accounting information for personal gain. One limitation of this research is that the

⁵ There continue to be many unanswered questions about the book-tax gap. It is frequently argued that tax aggressiveness must have increased over the mid to late 90s as reported corporate profits surged more than reported taxable income. However, it is unclear why firms would begin to seek to lower their tax burden more during this period rather than others. What changed during this time period? While the sophistication of capital markets has increased over time yielding new sheltering opportunities, the extent of the increase in the book-tax gap seems to far exceed documented examples of product sheltering (see Graham and Tucker, 2006; Wilson 2009). Furthermore, many new sheltering products were created because Treasury had eliminated an original transaction (e.g., the elimination of "Boss" led to the creation of "Son of Boss").

methodology typically correlates CEO equity incentives with some outcome related to the entire firm (e.g., an accounting restatement or an SEC AAER). Obviously, the CEO has a complex job and may not even be the specific person deciding on the reported accounting numbers. Thus, it is desirable to examine the impact of incentives in a setting where the job of the executive is more well-defined, such as the tax director. For the case of accounting manipulation, it would be natural to examine the incentives of the CFO and accounting managers. In our setting, the incentives of the tax director should be the primary focus of the analysis.

In contrast to the fairly extensive literature on incentives and financial misreporting, there is relatively little work linking executives' incentives with tax aggressiveness. Slemrod (2004) develops the idea that shareholders select the level of tax aggressiveness by linking tax manager compensation with effective tax rates or stock price. However, one problem with this type of compensation contract is that shareholders cannot observe either the compensation contract or whether managers are engaging in legal tax planning or illegal tax evasion. This means inappropriate aggressive behavior by the tax director constitutes a "hidden action" because tax returns are not disclosed to investors (see Crocker and Slemrod, 2005) and shareholders cannot observe whether to alter the executive's compensation contract until the firm is penalized. In addition, it is difficult to contract on tax evasion since the behavior is illegal and therefore would render any contract built upon tax evasion unenforceable by the courts (Chen and Chu, 2005). Ultimately, Slemrod (2004) suggests that corporate tax noncompliance could be the result of the design of incentive compensation plans.⁶

⁶ However, for the purposes of our study, a shortcoming of the literature investigating the link between incentives and tax planning is that it fails to address that large public firms are typically not assessed fines

Desai and Dharmapala (2006) develop a model linking equity-based compensation and aggressive tax planning. They argue that there are complementarities between tax-sheltering and rent extraction that imply that better governed firms will have more tax sheltering behavior. Although equity incentives can motivate managers to increase tax sheltering, this decision will also lead to fewer diversion opportunities for managers to engage in rent extraction. Thus, the relation between equity-based compensation and tax sheltering is theoretically ambiguous.

There is also a growing related literature that investigates whether corporate culture and individual managers influence a firm's level of tax aggressiveness. Frank et al (2009) argue that a positive relation between aggressive financial and tax reporting is consistent with a generally aggressive corporate "tone and culture." Ultimately, they find evidence of a positive relation between earnings management and tax planning and that the market appears to reward this aggressiveness. However, they do not find meaningful evidence that the CEO and CFO are provided with incentives to undertake such behavior.

Phillips (2003) investigates whether compensating managers on a pre- versus post-tax basis alters the firm's reported tax expense. Using a proprietary dataset, he finds that compensating business unit managers on an after-tax basis is associated with lower business unit effective tax rates. Dyreng et al (2007) and Rego and Wilson (2008)

or penalties upon audit (See Morton 1992 which provides evidence that the ratio of noncompliance to firm value shrinks with firms size suggesting that noncompliance activity is focused in smaller firms). Most settlements made with the taxing authorities at a fraction of the dollar amount of the original assessment. Therefore, non-evasion aggressive tax planning can be viewed as merely a borrowing arrangement with tax authorities. These models also do not consider that the nature of the underlying tax planning (temporary versus permanent tax deductions) and the tax planning's impact on the financial statements. In the absence of fines and penalties, the reversal of permanent tax deduction will have a much greater impact on a firm's effective tax rate than a reversal of a temporary tax deduction. Hence, we need models that jointly consider the cash flows and earnings implications of tax planning when considering optimal tax director incentives. Note that both Crocker and Slemrod (2005) and Chen and Chu (2005) focus on incentives and tax evasion rather than linking incentives to general tax director planning duties that affect either earnings or cash flows

investigate whether top management is associated with firms' level of tax aggressiveness. Although they conclude that top management is associated with tax planning, it is not clear whether their results are attributable to top management explicitly setting the "tone at the top" with regard to tax aggressiveness or making strategic decisions such as investment and financing policies which are highly correlated with a firm's tax position.

Finally, Robinson et al (2008) attempt to measure tax manager incentives by determining whether the tax department is viewed as a profit center (i.e., a "contributor to the bottom line"). Although an indirect measure of managerial incentives, this is one of the few studies to consider the compensation plan of the tax manager (as opposed to the CEO, CFO, or other senior executives). They find evidence that firms with tax departments that are viewed as profit centers have lower financial reporting ETRs, but only weak evidence that firms with tax departments that are viewed as profit centers have lower cash ETRs.

Although prior literature provides some evidence that managerial incentives influence accounting choices, there is relatively little evidence related to the precise incentives of the tax director. Thus, we focus our subsequent empirical analysis directly on the compensation and incentives of the tax director and the impact of these incentives on various tax planning outcomes.

4. Sample

Our sample is developed from the proprietary data files provided to us by major human resources consulting firm. These data cover fiscal years from 2002 to 2006 and are obtained by a detailed annual survey by the consulting firm. The proprietary data

provides information on the major components of executive compensation for many executive positions.⁷ We retain all public firms for which there is complete compensation data for CEO, CFO, general counsel, and tax director and for which we can estimate all of the tax attributes and control variables. Our final sample consists of 423 unique firms and 1,162 firm-year observations that are nearly uniformly distributed across the sample period (244, 239, 222, 234, and 223 observations from 2002 to 2006, respectively).

The industry composition of the sample relative to all firms on Compustat for the same sample period (i.e., 2002 to 2006) is provided in Table 1, Panel A. Relative to the full Compustat sample, our sample of firm years includes a greater proportion of firms from Food, Textiles and Chemicals and a somewhat smaller proportion of firms from Financial Services, but is otherwise very similar. In Panel B of Table 1, we report the representation of our sample in both the population of Compustat and the S&P 500. Across all years, our sample represents approximately 30% of total assets and 33% of the total cash paid for taxes of firms in Compustat. In addition, although our sample includes roughly 50% of the firms in the S&P 500, it includes 65% of the total assets and 60% of the total cash paid for taxes.

Descriptive statistics for our sample are reported in Table 2. The mean (median) revenue and market capitalization for our sample is \$17,817 (\$8,211) million and \$23,555 (\$9,173) million, respectively. Our sample firms are profitable, reporting a mean (median) return on assets of 5% (5%). Consistent with other studies that study compensation and tax planning, our sample is highly levered with a mean (median) debt

⁷ Note that no names are provided in the survey. Rather, the consulting firm provides each employee with a job classification code that enables us to compare positions across firms.

to assets ratio of 20% (18%). Finally, sample firms report mean taxable income of \$1,270 billion on pre-tax income of \$1,838 million. Thus, our sample is composed of very large firms that (as we will see in Section 5) have sizeable tax burdens.

5. Variable Measurement and Methodological Approach

5.1. Executive Incentives

We have detailed data about the annual salary, annual bonus, annual restricted stock and option grants and expected payouts from long-term incentive plans (e.g., stock options, restricted stock, performance units, and performance shares) for each executive in our data set. The total value of annual executive compensation is computed as the sum of these components, where restricted stock is valued using the market value at date of the grant and stock options are valued using the Black-Scholes risk-neutral value.⁸ We also use these data to compute compensation mix which is the ratio of variable compensation (i.e., bonus, stock options, restricted stock, performance units, and performance shares) to total compensation.⁹ Compensation mix is commonly used in consulting practice as a measure of managerial incentives and is similar to the measure used in prior studies such as Ittner et al (2003) and Erickson et al (2006).¹⁰

⁸ The parameters of the Black-Scholes formula are calculated as follows. Annualized volatility is calculated using continuously compounded monthly returns over the prior 36 months (with a minimum of 12 months of returns). The risk-free rate is calculated using interpolated interest rate on a Treasury Note with the same maturity (to the closest month) as the remaining life of the option multiplied by 0.7 to account for the prevalence of early-exercise. Dividend yield is calculated as the dividends paid over the last 12 months scaled by the stock price at the beginning of the month. This is essentially the same method described by Core and Guay (2002).

⁹ We also disaggregate this ratio into bonus mix and equity mix defined as the ratio of the annual bonus to total compensation and the ratio of the value of the current year's stock and option grants to total compensation, respectively. For the sake of brevity, we do not report results from using these variables instead of compensation mix, but find that they are generally similar to those with compensation mix which suggests that the incentives are not uniquely attributable to either the bonus or equity grants.

¹⁰ The incentives literature also uses the portfolio delta (e.g., Core and Guay, 1999) as a measure of executive incentives. This measure captures the change in the risk-neutral value of an executive's firm-

The descriptive statistics reported in Table 2 reveal that the mean (median) total level compensation ranges from \$13,662,000 (\$9,839,090) for the CEO to \$787,727 (\$558,714) for the tax director. The observed level of CEO compensation is expected since our sample generally consists of very large firms. Interestingly, the general counsel has a substantially higher level of compensation than the CFO (mean of \$2,114,037 versus \$1,178,060). In terms of compensation mix, mean (median) for the CEO is 0.85 (0.90) and 0.59 (0.63) for the tax director. Note that the relatively high level of compensation mix attributable to equity (45% = 59% less 14% of bonus), suggest that the tax director's duties extend beyond compliance.

We use two complementary measures of executive incentives in our analysis. Our first measure is the “excess” level of compensation received by the executive during the year. The amount of compensation in excess of the level commensurate with the economic characteristics of the executives' contracting environment should measure the amount of loss that would be incurred if the executive does not attain their goals and targets. Similar to an efficiency wage argument, this variable assumes that managerial incentives are a function of compensation in the present job relative to alternative employment. We assume that managerial incentives are increasing in the level of excess compensation.¹¹ For the tax director, we expect the normal component of that executive's compensation to capture the remuneration related to compliance aspects given the observable features of

specific equity portfolio holdings for a 1% change in the price of the underlying stock. One limitation of our data set is that it does not provide information about the firm-specific equity holdings of the executives which precludes us from calculating the equity portfolio delta for either the tax director or the other executives. We suspect that the equity ownership by the tax director is modest, and thus analyzing the current year's compensation and compensation mix will be a reasonable assessment of managerial incentives.

¹¹ An alternative interpretation is that excess compensation is a measure of (unobserved) executive quality, or talent, which is not captured in our model of excess compensation. For our specific setting, we would expect higher paid executives (i.e., those with larger “excess” compensation) to have more skill and produce lower observed tax rates.

the contracting environment. The excess compensation for the tax director should therefore measure the incentive for reducing tax payments and/or reducing the impact of taxes for financial reporting purposes. Our second measure is “excess” compensation mix of the executive. We use the excess rather than the raw value for mix because we want to capture the portion of mix that is not associated the normal characteristics of the contracting environment.¹²

To develop our excess measures, we rely on a model of the level of compensation and compensation mix from prior literature and we use the residual from the following model (which we estimate separately for each executive position in order to allow the relationship to differ across the various positions) as the measure of “excess” compensation and “excess” compensation mix.

$$\begin{aligned}
 \text{Compensation}_{i,t} = & \alpha_0 + \alpha_1 \text{Market-to-Book}_{i,t} + \alpha_2 \log(\text{Market Cap}_{i,t}) + \alpha_3 \text{Return-on-Assets}_{i,t} \\
 & + \alpha_4 \text{Std Dev. ROA}_{i,t} + \alpha_5 \text{Leverage}_{i,t} + \alpha_6 \text{Return}_{i,t-1} + \alpha_7 \text{Volatility}_{i,t} + \text{Year} \\
 & \text{Indicators} + \text{Industry Indicators} + v_{i,t}
 \end{aligned} \tag{1}$$

where $\text{Compensation}_{i,t}$ is either the natural logarithm of the level of total compensation or compensation mix for the executive-year. The market-to-Book ratio (*Market-to-Book*) is included to capture the growth opportunities of the firm. Firm size ($\log(\text{Market Cap})$) is included because it is well-known that the level of incentives are increasing in the size and complexity of the firm. Prior performance (*Return-on-Assets* and *Return*) captures the prior operating and stock price performance of the firm. Similarly, firm risk (*Std Dev. ROA* and *Volatility*) are included to control for operating and stock price risk. We do not have a prediction for the sign of these two variables because evidence on the empirical relation between risk and incentives is mixed (Prendergast, 2002). We include the firm’s

¹² All of our subsequent analyses yield similar results when we use either the raw level of compensation or compensation mix.

debt-to-equity ratio (*Leverage*) to capture the impact of the firm's capital structure on firm risk and the necessary level of incentives (John and John, 1993). Finally, year and industry indicators are included because these fixed effects have been shown to capture a substantial portion of the variability in incentives as a result of compensation benchmarking.

The results from estimating equation (1) are presented in Table 3. Consistent with prior research, firm size and industry explain much of the cross-sectional variation in compensation level and mix for the four executive positions.

5.2. Book-Tax Gap

We initially examine the book-tax gap as this measure has received considerable attention from the U.S. Treasury, regulators, and academics. We model the book-tax gap as a function of both economic variables that have been suggested by prior literature (e.g., Desai and Dharmapala, 2006) and the incentives of key employees within the company. We specify the model as follows.

$$\begin{aligned}
 BTG_{i,t} = & \beta_0 + \beta_1 Incentives + \beta_2 Operating\ Cash\ Flow + \beta_3 Std\ Dev.\ ROA_{i,t} + \beta_4 \log(Market \\
 & Cap_{i,t}) + \beta_5 Leverage_{i,t} + \beta_6 Change\ in\ Goodwill_{i,t} + \beta_7 New\ Investment_{i,t} + \\
 & \beta_8 ForeignAssets_{i,t} + \beta_9 Proportion\ Tax\ Fees_{i,t} + \beta_{10} TaxFees_{i,t} + Year\ Indicators \\
 & + Industry\ Indicators + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

where *BTG* is the book tax gap measured globally and is scaled by total assets at the beginning of the period. The *BTG* is measured as the difference between pre-tax income less income attributable to minority interest (Compustat PI – MII) and taxable income (defined as current federal tax expense (TXFED) grossed up by the maximum federal statutory tax rate (i.e., 35%) plus pre-tax foreign income (PIFO) less the annual change in

NOLs (NOL)) scaled (by total assets).¹³ *Incentives* are the incentives of the CEO, Tax Director, General Counsel and CFO, respectively, measured as either the excess level of compensation or the excess compensation mix (described in Section 5.1). Below we describe the economic and external tax planning variables included in the model.

5.2.1. Economic controls

We include *Cash Flow from Operations* scaled by average assets to control for the underlying economic activity of the firm. *Std Dev. ROA*, defined as the standard deviation of annual Return on Assets (NI / beginning of period AT) over the previous five years, is included to capture variability in the firm's operations. *Log(Market Cap)*, defined as the natural logarithm of the firm's market capitalization at the fiscal year end, is included to capture variation in the book-tax gap that is associated with firm size (Rego 2003). As there are economies of scale of tax planning, larger firms are more likely to have a sophisticated internal tax department. *Leverage*, defined as the ratio of the firm's long-term debt to total assets (LT/AT), is included to capture the extent of the tax shield of debt. *Change in Goodwill*, defined as the annual increase in the firm's goodwill scaled by beginning total assets ($\Delta\text{GDWL}/\text{Beginning AT}$) is included to capture merger and acquisition activity of the firm during the year. If goodwill decreases, then *Change in Goodwill* is set to zero. *New Investment*, defined in Richardson (2006) as the sum of Research and Development expense, Capital Expenditures, and Acquisitions less the sum of Sales of Property and Depreciation all scaled by Total Assets ($(\text{XRD} + \text{CAPX} + \text{ACQ} - \text{SPPE} - \text{DPC}) / \text{Avg. AT}$), is included to control for the firm's investment activity since

¹³ We ignore the tax benefit of stock options (TXBCO + TXBCOF) in our estimate of the BTG because the benefit of options was a known difference between book and taxable income during the majority of our sample period. The tax benefit of options, however, is considered in our measures of taxable income in later analyses.

tax authorities typically provide tax incentives for new investment (e.g., the investment tax credit, accelerated depreciation methods and bonus depreciation). *Foreign Assets* are estimated using the methodology described in Oler et al (2007) which uses the consolidated turnover ratio and foreign segment sales to infer foreign assets. We include an estimate of the firm's foreign asset base to capture differential tax rates that typically apply to firms' foreign activities.

5.2.2 External Tax Planning

Firms may choose to utilize external providers for tax planning thereby potentially weakening the link between tax director compensation and measures of tax planning. We include two proxies for the extent of a firm's use of tax consulting services. *Tax Fees* is the total tax fees paid to a firm's external auditor scaled by total assets.¹⁴ The greater a firm's tax fees are relative to its size, the more likely the firm has contracted with a service provided for tax planning purposes. *Proportion Tax Fees* is that ratio of tax fees to total fees paid to the external auditor. The greater this ratio, the more emphasis a firm places on its tax planning/reporting. We anticipate that both of these measures will be positively associated with measures of tax planning.

5.2.3 Components of the Book-Tax Gap

Table 2 shows that the mean book-tax gap is 5.0% of total assets.¹⁵ The positive measure means that book income is greater than taxable income. Although the book-tax gap is an important tax construct, there are both economic and econometric reasons why book-tax gap might be problematic as a dependent variable. The book-tax gap is

¹⁴ Note that to the extent the firm utilizes non-auditor tax consulting services our *Tax Fees* measure will be too low.

¹⁵ Untabulated analysis reveals that the mean BTG for our sample is positive for all years during our sample period. In fact, the BTG is positive for the S&P500 for the entire sample period as well.

measured as the difference between pre-tax book income and taxable income (i.e. $BTG_{i,t} = PBI_{i,t} - TI_{i,t}$, where PBI is PI and TI is $(TXFED)/0.35 + PIFO - \Delta TLCF$) and each of its two components is likely to exhibit a different relationship with the independent variables included in equation (2). From an economic perspective, the book-tax gap itself might not be the construct of interest because some executives influence the measure indirectly (e.g., the CEO setting of the firm's investment policy) and others directly (e.g., the CFO smoothing earnings). Since we are specifically interested in the direct links between tax aggressiveness and managerial incentives, we disaggregate the book-tax gap into its two components and jointly estimate both equations using seemingly unrelated regression (Zellner, 1962). Joint estimation of the two resulting equations allows us to compare coefficients across the two equations.

In addition, the disaggregation of the measure into its components allows us to investigate whether there is evidence of conforming tax planning. When a firm undertakes conforming tax planning, book income will be reduced because the firm seeks to lower taxable income. Since large book tax differences may catch the attention of the tax authorities, firms may be willing to undertake conforming tax planning because it increases the likelihood that the firm will prevail under audit (Mills 1998, Cloyd, Pratt and Stock 1996).

5.3. Effective Tax Rates

The next set of tax attributes that we examine are the financial and cash effective tax rates. The financial effective tax rate is the ratio of total tax expense to pre-tax book income (TXT/PI). It is composed of a current and deferred component. Although the current tax expense is an estimate of the current taxes owed to the tax authorities, it does

not include the tax benefit from stock options until the post-FAS123R period. Deferred tax expense captures the tax implications of differences between book and tax accrual accounting. Consistent with other studies, Table 2 reports that mean (median) *Financial ETR* is about 30% (31%). A financial effective tax rate lower than the statutory tax rates suggests that firms have income included in book income that will never be recorded in taxable income (e.g., municipal bond interest and permanently reinvested earnings). A disaggregation of the financial effective tax rate into its current and deferred components (*Current ETR* and *Deferred ETR*) reveals that the deferred component of the effective tax rate tends to be much smaller than the current component (mean values are 26% and 9%, respectively), which is consistent with timing differences reversing over time.

The *Cash ETR* measures the current cash outflows for income taxes as a percentage of pre-tax book income $((TXPD + (TXBCO + TXBCOF)) / PI)$.¹⁶ Unlike the cash effective tax rate, the financial effective tax rate incorporates the estimated tax implications of accruals, so it does not capture the notion that firms benefit from book-tax accrual differences that allow the deferral of cash tax payments. Table 2 reveals that the mean (median) cash effective tax rate is 29% (23%) which suggests that our sample has accruals that increase pre-tax book income but not taxable income.

Similar to equation (2), it is necessary to specify the appropriate controls variables for ETR. A number of studies have estimated models of either the financial or cash ETR and have documented certain economic and other determinants. Prior studies' evidence on

¹⁶ Unlike, Dyreng et al (2008), our measure of the cash effective tax rate considers the impact of stock options and special items. We view the cash benefit of stock options as a *de facto* cash payment for income taxes. In addition, Dyreng et al's omission of special items from the denominator leads to downward biased estimates of the cash effective tax rates. In Table 2, we also report descriptive statistics on *Cash ETR w/o option benefit* which excludes the tax benefit from stock options in the numerator. The mean and median values of this measure of the cash effective tax rate are slightly lower than the mean and median values of *Cash ETR*.

the relation between ETRs and firm size is mixed. For example, Rego (2003), Zimmerman (1983), and Omer et al (1993) document a negative relation between firm size and ETRs (consistent with the political cost hypothesis) while Jacob (1996), Gupta and Newberry (1997), and Mills et al (1998) do not find a statistically significant relationship. We therefore include firm size but are agnostic about the expected sign.

We include leverage to capture differences in tax rates that result from different capital structure. We also include new investment to capture differences in depreciation rates and other preferential tax treatment (e.g., accelerated and “bonus” depreciation) for existing assets in place and newly acquired assets. Rego (2003) finds that multinational firms with more extensive foreign operations have lower worldwide ETRs (which she interprets as being consistent with economies of scale in tax planning). We therefore include the foreign assets of the company to control for differences in international planning opportunities. The change in goodwill from the prior year is included to capture changes in merger and acquisition activity of the firm. Often, there are material tax consequences to these transactions that are not fully reflected in our measures of tax planning. We also include proxies for external tax planning (*Tax Fees* and *Proportion Tax Fees*) to control for tax planning activity that the firm has contracted with their professional service provider. Finally, prior studies have documented substantial variation in ETRs across industries and over time. We include year and industry indicator variables to capture the average effect of this variation. This yields the following model of effective tax rates.

$$ETR_{i,t} = \beta_0 + \beta_1 Incentives_{i,t} + \beta_2 Return-onAssets_{i,t} + \beta_3 Std\ Dev.ROA_{i,t} + \beta_4 Log(Market\ Cap)_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 Change\ in\ Goodwill_{i,t} + \beta_7 NewInvestment_{i,t} +$$

$$\beta_8 \text{Foreign Assets}_{i,t} + \beta_9 \text{ProportionTaxFees}_{i,t} + \beta_{10} \text{TaxFees}_{i,t} + \text{YearIndicators} + \text{IndustryIndicators} + \varepsilon_{i,t} \quad (3)$$

where *ETR* is either the financial or cash effective tax rate. *Incentives* are the incentives of CEO, Tax Director, General Counsel and CFO measured as either the excess level of compensation or excess compensation mix as described above. All of the remaining variables are as defined above. In addition, all independent variables are winsorized at the 1% level to ameliorate the effect of influential observations on the results. Finally, since both dependent variables are bound in the (closed) interval [0,1], we estimate the models using a doubly-censored Tobit specification to eliminate bias that might otherwise result from OLS estimation.¹⁷

¹⁷ All tabulated specifications were also estimated using ordinary least squares and produced almost identical results, which is not surprising given the relatively low fraction of observations that are censored at either end of the [0,1] interval. It can be shown that OLS estimates will be identical to those from a doubly-censored Tobit when there are no censored observations.

5.4. Tax Aggressiveness

The final tax attribute that we examine is tax aggressiveness. As discussed above, there is no generally accepted definition of this construct and its measurement can be problematic. Nevertheless, we investigate two recently developed measures of tax aggressiveness: Frank et al's (2009) *DTAX* and Wilson's (2009) *Tax Shelter*. Note that Frank et al (2009) define "aggressive tax reporting" as "a downward manipulation of taxable income through tax planning that may or may not be considered fraudulent tax evasion." Anecdotal evidence suggests that the most egregious tax planning involves transactions that create permanent differences.¹⁸ By creating permanent differences, the firm reduces cash taxes paid without decreasing financial statement income.

To investigate whether incentives are associated with permanent differences, we begin by computing a modified version of Frank et al's (2009) *DTAX* measure of discretionary permanent differences. Frank et al (2009) compute *DTAX* as the residuals from a model that regresses an estimate of permanent differences on measures of intangible assets, income of unconsolidated subsidiaries, minority interest, state tax burdens, changes in NOLs and lagged permanent differences. We modify this computation by including our measure of foreign assets estimated using the Oler et al (2007) methodology. This change enables us to refine the measure of *DTAX* to only capture the "aggressive" component of multinational tax planning. By including Foreign Assets in the first stage we control for differences that result from overseas operations.

¹⁸ The 1999 Treasury White Paper on corporate tax shelters noted that following: "There is a current trend among public companies to treat corporate in-house tax departments as profit centers that strive to jeep the corporation's effect tax rate low and in line with that of competitors. Accordingly, in most recent corporate tax shelters involving public companies, the financial accounting treatment of the shelter item has been inconsistent with the claimed Federal income tax treatment." See Mills and Outslay (2004) for further discussion of the prevalence of permanent difference creation in tax shelter arrangements.

Without this modification, *DTAX* would suggest that firms with extensive foreign operations or foreign operations in low tax jurisdiction are always more aggressive tax planners. Table 2 reports that the mean (median) *DTAX* is 7.5% (0.30%) of total assets. Positive levels of *DTAX* indicate that our sample of firms has discretionary permanent differences that reduce taxable income.

We investigate whether executives have incentives to engage in creating permanent differences using the following model.

$$\begin{aligned}
 DTAX_{i,t} = & \gamma_0 + \gamma_1 Incentives_{i,t} + \gamma_2 Return-on-Assets_{i,t} + \gamma_3 Std\ Dev.\ ROA_{i,t} + \gamma_4 \log(Market \\
 & Cap_{i,t}) + \gamma_5 Leverage_{i,t} + \gamma_6 Change\ in\ Goodwill_i + \gamma_7 NewInvestment_{i,t} + \gamma_8 Foreign \\
 & Assets_{i,t} + \gamma_9 ProportionTaxFee_{i,t} + \gamma_{10} TaxFees_{i,t} + v_{i,t}
 \end{aligned} \tag{4}$$

where the variables are as defined above.

Next, we investigate whether tax director incentives are associated with the predicted presence of tax shelters. We estimate Wilson's (2009) *SHELTER* measure, which was developed using a sample of approximately 60 firms identified in court documents as having participated in illegal tax shelters. We use the following model to determine whether tax director incentives are associated with high probabilities of sheltering behavior.

$$\begin{aligned}
 SHELTER_{i,t} = & \gamma_0 + \gamma_1 Incentives_{i,t} + \gamma_2 Return-on-Assets_{i,t} + \gamma_3 Std\ Dev.\ ROA_{i,t} \\
 & + \gamma_4 \log(Market\ Cap_{i,t}) + \gamma_5 Leverage_{i,t} + \gamma_6 Change\ in\ Goodwill_i \\
 & + \gamma_7 NewInvestment_{i,t} + \gamma_8 Foreign\ Assets_{i,t} + \gamma_9 ProportionTaxFees_{i,t} \\
 & + \gamma_{10} TaxFees_{i,t} + v_{i,t}
 \end{aligned} \tag{5}$$

6. Results

6.1. Book-Tax Gap and its Components

The results of the book-tax gap analysis are presented in Table 4. We find no relation between the book-tax gap and the level of excess compensation or excess compensation

mix. In addition, we find no relation between the incentives of the tax director and either component of the BTG, PBI or TI. Interestingly, the GCs' excess compensation mix is positively associated to the BTG. This relation appears to stem from a relation between GC compensation and TI which suggests that the GC, rather than the tax director, is compensated for tax planning. Our results are consistent with GC involvement in "listed" transactions (i.e., tax shelter transaction requiring a legal opinion) which typically generate significant reductions to taxable income. Later analyses investigate whether incentives are associated with proxies of aggressive tax planning.

In terms of the control variables, the positive association between *BTG* and *Operating Cash Flow* suggests that more profitable firms have a greater wedge between book and taxable income. When the dependent variable is pre-tax book (taxable) income, in all models, the estimated coefficient on cash flows of approximately 0.60 (0.54) indicating that pre-tax book (taxable) income is, on average, roughly 40% (46%) lower than cash flows from operations. The positive relation between log(Market Capitalization) and measures of firm performance (PBI and TI) is consistent with profitable firms being more valuable.

Overall, the results of the taxable income specification support the notion that there is little cross-sectional variation in the incentives granted to executives to reduce taxable income. Furthermore, since our sample of large public firms likely is adverse to tax planning opportunities that reduce both book and tax income, we next investigate whether tax directors are incentivized on after-tax measures of tax planning.

6.2. Financial ETR

The results of estimating equation (3) where the financial ETR is the dependent variable are presented in Table 5. We first consider the role of the level of compensation which is presented in Panel A. In the first model, where all of the positions are simultaneously considered, we find a strong negative relation between tax director compensation and the financial ETR and no significant relation with the other three executives considered. This strong negative relation continues to hold when we estimate the model considering only one executive at a time (i.e., Model 3).

When we measure incentives as the compensation mix in Panel B, we again find a strong negative relationship between the tax director and the financial ETR when all executives are considered together. We continue to find a negative relation when only the tax-director's compensation is included in the analysis (i.e. Model 3). Overall, the evidence presented in Table 5 provides strong support for the notion that tax directors, but not the CEO, GC and CFO, are compensated for managing financial effective tax rates.

We only find two significant relations between the financial effective tax rate and the control variables. *Return on Assets* is significantly positive which indicates that more profitable firms have higher effective tax rates. In addition, we find that, consistent with the presence of more sophisticated planning, having a higher *ProportionTaxFees* is associated relatively lower financial effective tax rates.

Interestingly, these results along with those from estimating the book-tag gap and its components together suggest that tax directors are compensated on after-tax financial reporting measures rather than pre-tax measures. In particular, since we find a no association between taxable income and tax director incentives, the negative relation with

the financial ETR is consistent with tax directors undertaking tax planning involving permanent differences. Overall, our findings provide corroborating evidence to Robinson et al's (2008) finding that firms incentivize the tax department to mitigate the impact of taxes on bottom line net income.

6.3. Cash ETR

The results of estimating equation (3) with the cash ETR are presented in Table 6 and parallel our analysis of the financial ETR. When we consider the level of compensation as the measure of incentives in Panel A, we fail to find a significant relation between the incentives of any of the executives and the cash ETR. When compensation mix is considered as the level of incentives in Panel B, we again find no relation between executive incentives and the cash ETR in any of the specifications.¹⁹

We document several significant relations between the cash effective tax rate and the control variables. *Return on Assets* is significantly positive which indicates that more profitable firms have higher cash effective tax rates. *Std ROA* is negative and significant consistent with greater variation in a firm's earnings leading to lower the effective tax rates due to the convexity in the statutory rate structure. *Change in Goodwill* is positively related to the Cash ETR suggesting the M&A activity leads to lower pre-tax book income with no corresponding reduction to cash taxes paid (e.g, in process R&D). Finally, we find that, consistent with the presence incremental tax incentives, increased *New Investment* is associated relatively lower cash effective tax rates.

¹⁹ When we use *Cash ETR (3 year)* as the dependent variables, we find no association with measures of incentives. Note that this analysis reduces our sample to 772 firm years since we are unable to estimate *Cash ETR (3 year)* for 2006. The negative association between financial ETR and incentives continues to hold in this reduced sample.

Overall, the lack of a relation between incentives and cash ETR are in sharp contrast to the financial ETR results presented in Table 5. It could be that tax directors are expected to tax plan to the optimal level and so the variation in incentive pay does not explain variation in cash paid for taxes. Our results could also be construed as consistent with firms potentially forgoing cash savings to gain financial reporting benefits (i.e., Maydew et al., 1999; Hanlon et al., 2004). Our results also corroborate the Robinson et al (2008) finding of little to no association between the profit center motive of the firm's tax department and lower cash ETRs.

6.4. Measures of "Tax Aggressiveness"

Our final set of results relates to tax aggressiveness and is presented in Tables 7 and 8 (for *Shelter* and *DTAX*, respectively). Using the excess level of compensation as our measure of incentives, we no relation executive incentives and Wilson (2009)'s measure of sheltering behavior (*Shelter*). We, however, find a slight negative relation between the incentives of the CFO and *DTAX* when all of the executives are considered together, but this relation is not significant when the CFO is considered in isolation.²⁰ Overall, we find little evidence that the CEO, Tax Director, GC or CFO are incentivized to undertake aggressive tax planning.

7. Sensitivity Analyses

7.1. Governance characteristics

Prior literature such as Core, Holthausen and Larcker (1999) has shown that various governance characteristics are related to firms' compensation practices. In addition, recent research such as Desai and Dharmapala (2006) and Rego and Wilson

²⁰ We obtain similar results when we use Excess Compensation Mix as our measure of incentives.

(2008) suggest a link between firms' governance characteristics and the extent to which they engage in aggressive tax planning.²¹ We therefore repeat the analyses above including a broad array of governance variables that have been used in prior research. In particular, prior studies linking corporate governance to compensation practices have examined three broad categories of governance constructs: (i) Board of Director characteristics; (ii) Board structure; and (iii) state antitakeover laws. We obtain Board of Director data from the Equilar analysis of proxy statements and use six variables to capture Board characteristics: (i) the number of directors, (ii) the fraction of inside directors, (iii) the fraction of directors who are over 69 years old, (iv) the fraction of the board that is "busy" (which is measured as serving on at least two boards), (v) an indicator that equals one if the lead director is classified as an outsider and zero otherwise (where outsiders are not involved in the management of the company and do not have substantial business dealings with the company), and (vi) the fraction of directors classified as outsiders who were appointed after the current CEO's term began.²²

Next, we use data from *FactSet SharkRepellent* to measure board structure similar to Gompers et al. (2003), Daines and Klausner (2001), Bebchuk and Cohen (2005), and Faleye (2007). First, we include a set of indicator variables to capture whether the company's Board members are elected annually or are elected to staggered, multiyear terms.²³ We also include an indicator for whether the firm has multiple classes of shares with unequal voting rights.

²¹ In particular, Desai and Dharmapala (2006) argue that good governance increases the link between equity compensation and aggressive tax planning. In contrast, Rego and Wilson (2008) find that good governance tempers firms' aggressive tax planning.

²² Prior research generally considers an outside lead director to be indicative of strong governance and a negative relation between the other board characteristics and the strength of the governance structure.

²³ Activist shareholders argue that staggered terms impede shareholders' monitoring of the Board by making it more difficult for them to alter the Board's composition over a short time period.

Finally, similar to Bebchuk et al. (2002), Cheng et al. (2005), and Wahal et al. (1995), we include variables for state antitakeover laws. Their results suggest that the introduction of stronger antitakeover legislation leads to greater management entrenchment and weaker corporate governance. Our results (untabulated) are robust to the inclusion of governance metrics. Specifically, we continue to find a significant negative (no) relation between tax director incentives and the financial ETR (cash ETR and other measures of tax aggressiveness).

7.2. Reversing the regression

Prior studies investigating cross-sectional variation in firm's tax planning, model executive compensation as a function of the firm's tax attributes (e.g., Rego and Wilson, 2008; Desai and Dharmapala, 2006). These studies find that higher levels of compensation are associated with a higher level of tax aggressiveness. In addition, this specification allows researchers to evaluate which measure of tax planning dominates the others. We therefore estimate an expanded version of equation (1) where we include the additional control variables (see Table 2) and the *Financial ETR*, *Cash ETR*, *3-year lagged Cash ETR* and *5-year lagged Cash ETR*. In untabulated results, we find that the only measure of tax aggressiveness associated with tax director compensation is the Financial ETR which exhibits a significant negative relation with both the level of total compensation and compensation mix. Interestingly, we find a negative association between the Five Year Cash ETR and CFO compensation which confirms the findings of Rego and Wilson (2008).

7.3. Matched pair research design

There are two important limitations of the traditional linear regression approach used in the preceding tests of the relation between executive incentives and firm tax characteristics. First, this approach relies on a linear functional form linking the outcome variable of interest (i.e., tax characteristics) with both the independent variable of interest (i.e., executive compensation) and the other control variables or “covariates” (e.g., firm size, operating performance, tax professional fees, etc.). To the extent this linearity assumption is violated, the model is misspecified and can produce biased parameter estimates. Second, to the extent there is endogenous matching of executives with firms (and compensation contracts) on the basis of some unobserved characteristics (e.g., executive risk aversion or talent), this gives rise to traditional correlated omitted variable problems and this will affect the parameter estimates obtained from a linear model (Armstrong et al., 2009). In order to mitigate these econometric concerns, we also utilize a propensity score matched pair research design (Rosenbaum and Rubin, 1983; Rosenbaum, 2002).

Since a matched pair research design is typically nonparametric, it relaxes the assumption that an identical linear relation exists between the independent and control variables and the various tax attributes. This is likely to be important in our setting since there are a number of plausible nonlinear relationships that might exist between our independent variables and the various tax attributes (e.g., because of nonlinearities in either the tax code or incentive plans). A matched pair research design forms matched pairs of observations that differ in the treatment variable of interest (i.e., executive incentives) but are otherwise similar along other relevant variables (i.e., economic and tax planning characteristics). Any difference in outcome of interest (e.g., book-tax gap,

financial ETR, or cash ETR) can be more appropriately attributed to differences in the level of the executive's incentives rather than to differences in the other variables, regardless of the underlying structural form.

A matched pair design is particularly important in our setting because it also enables us to assess the sensitivity of our results to unobserved correlated omitted variables.²⁴ In particular, our matched pair research design explicitly acknowledges that observed executive compensation contracts are not likely the result of random assignment, but are instead likely to be a result of endogenous matching of executives and firms based on the characteristics of the contracting environment. After matched pairs have been formed on the basis of observable characteristics and statistical tests for differences in tax characteristics is conducted, we can assess the sensitivity of any significant results to unobservable, correlated omitted variables. Specifically, we can determine the magnitude of the correlated omitted variable bias that is necessary to cause any statistically significant differences between matched pairs to become insignificant. While this approach does not resolve the endogeneity problems, the computation enables us to provide some insight into whether our results are robust to endogenous matching.

Our propensity score matched pair research design requires a model for the conditional probability of receiving a given amount or mix of compensation given observable features of the contracting environment. Consistent with many prior studies, we assume that the choice of the level and mix of compensation are a function of the

²⁴ An alternative way of characterizing the correlated omitted variable problem in our setting is that there is the potential for endogenous matching (or sorting) of executives and companies. If, for example, executives who are relatively more risk-tolerant decide to work for companies that offer more risky, incentive-based compensation packages (because these are the executives who are better able to bear the associated risk), any observed relation between executive incentives and certain tax characteristics (e.g., tax aggressiveness) could be a result of differences in executive risk-tolerance rather than differences in the observed incentives.

economic and tax planning characteristics discussed in the Sections 5.2.1 and 5.2.2.

After estimating the conditional probability of receiving a given level or mix of compensation, we then form matched pairs that have the closest conditional probability of receiving a given level or mix of compensation, but in fact, have the most dissimilar observed level or mix of compensation.²⁵

We evaluate the efficacy of our matching algorithm by examining the covariate balance (i.e., the similarity of the distributions of the variables in the propensity score model) between the matched pairs. Covariate balance is achieved if the two matched groups (i.e., the firm years with relatively high incentives and the firm years with relatively low incentives) appear similar with respect to their observable contracting environments (i.e., the economic and tax planning covariates in the propensity score equation). Lack of balance across certain covariates highlights an identification problem that makes it difficult to separate the effects of the treatment (i.e., executive incentives) from the effect of the unbalanced covariate (e.g., firm size).²⁶

To assess covariate balance between the treatment and control groups, we conduct tests of differences in means using parametric t-tests and for differences in medians using nonparametric Kolmogorov-Smirnov (KS) tests. The (untabulated) results indicate that

²⁵ We also required matched pairs to be from the same year and industry. The matched sample was constructed using a nonbipartite matching algorithm suggested by Derigs (1988) which is an “optimal” algorithm in the sense that it considers the potential distances between *other* pairs when forming a particular matched pair. The matching was done without replacement.

²⁶ To illustrate this point in the current context, suppose that tax directors of large (small) companies always receive relatively high (low) incentives. This means that it is not possible to form a matched pair of tax directors at firms that are of a similar size, but exhibit different levels of incentives (i.e., there is a lack of balance across the matched pairs with respect to firm size). Consequently, any difference in the tax attributes across the matched pairs cannot be unambiguously attributed to differences in the level of incentives because the difference could also be attributable to differences in firm size. Thus, examining the covariate balance across the matched pairs is crucial for highlighting any identification problems that might exist.

none of the mean or median comparisons is significantly significant ($p < 0.10$, two-tailed), providing evidence that the variables in the propensity score model are balanced across the matched pairs.

A formal test of the difference in Financial and Cash ETR between matched pairs is presented in Panels A and B of Table 9, respectively. We observe that both higher levels of Tax Director compensation and Tax Director compensation mix exhibit a strong negative relationship with the financial ETR (Wilcoxon p-values of 0.0001 and 0.0275, respectively and t-statistic p-values of 0.0005 and 0.0266, respectively). Further, both the mean and median differences in the Financial ETR of -0.029 and -0.019 between the firms with a relatively high and relatively low level of Tax Director compensation, respectively, and -0.019 and -0.011 for Tax Director compensation mix, respectively, are economically significant. The cash ETR results in Panel B show that none of the incentives variables exhibits a significant relation with the cash ETR. These results are consistent with those of the linear regressions presented above and suggest that the relation is robust to the functional form linking the incentive and control variables with the tax outcomes.

Propensity score matching mitigates overt bias by balancing the relevant covariates across the two categories of interest (e.g., executives that have relatively high incentives and their matched counterparts that have relatively low incentives but otherwise look similar). However, similar to all empirical studies, the results are susceptible to “hidden bias” if there are correlated omitted variables that are not balanced across the two categories. Rosenbaum (2002, 2007) develops a bounding approach for assessing the

sensitivity of the matched pair results to hidden bias.²⁷ In untabulated sensitivity analysis, we find that the results remain statistically significant to the existence of a correlated omitted variable that shifts the assignment of executives to the treatment group from a 50%/50% probability of being assigned to the high and low incentives categories to a 66.5%/33.5% probability assignment.²⁸ Thus, our results are robust to substantive correlated omitted variables and this provides some justification for drawing causal conclusions regarding the relation between tax director incentives and financial ETRs.

8. Conclusion

To our knowledge, this is the first paper to directly study the link between the incentives of tax directors and measures of the extent of their firm's tax planning. Overall, our analysis of the book-tax gap, its components, the cash effective tax rate, and measures of tax aggressiveness provides little evidence that our sample of large, publicly traded firms explicitly incentivize their tax function to undertake aggressive measures to

²⁷ In our context, hidden bias exists if two executive (denoted i and j) have the same observed (economic and tax planning) covariates, but different probabilities (denoted π) of having a particular level of incentives. The odds that each executive was assigned to the high and low incentives category are denoted $\pi_i/(1-\pi_i)$ and $\pi_j/(1-\pi_j)$ respectively. If the odds ratio (following Rosenbaum (2002), denoted by Γ , does not equal one, then the two executives have an unequal probability of being assigned to a category and hidden bias exists. Rosenbaum (2002) shows that relaxing the assumption that $\Gamma = 1$ allows for a computation of the amount of hidden bias (or, the strength of a correlated omitted variable) that is needed to alter any significant inferences. Smaller values of Γ indicate statistically significant results that are more sensitive to hidden bias.

²⁸ In other words, the statistical tests conducted in Table 9 are based on the assumption that, conditional on the variables in the propensity score model, executives have a 50% probability of being assigned to both the treatment and control groups (i.e., the high and low incentives groups). If instead, because of some correlated omitted variable (e.g., executive risk-tolerance), executives with a higher observed level of incentives were actually assigned to the treatment group 66.5% of the time and assigned to the control group only 33.5% of the time (or $\Gamma = 2$), a statistically significant difference in the financial ETR between the two groups would still obtain. To our knowledge, no strict benchmark exists to determine whether a given Γ is "large" or "small." The designation is inherently subjective and depends on beliefs as to the degree of endogenous selection on unobservable factors. Given the extensive controls included in the propensity score matching, we believe that it is unlikely that a correlated omitted variable exists that will produce a $\Gamma > 2$.

lower the firm's cash tax burden. Instead, we find that tax executives are provided with incentives to reduce the financial effective tax rate. We interpret these results as indicating tax directors receive base compensation for minimizing cash outflows for taxes and incentives to generate a favorable impact to the financial statements (i.e., minimize the financial ETR).

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Appendix A: Variable Definitions

<i>Variable</i>	<i>Definition</i>	<i>Source and Data Codes</i>
<i>Total CEO Compensation, Total Tax Director Compensation, Total GC Compensation, and Total CFO Compensation</i>	total annual compensation of the CEO, Tax Director, General Counsel and CFO, respectively, where total annual compensation is defined as the sum of salary, bonus, the market value of target long-term incentive payouts, perquisites, the market value of restricted stock and the risk-neutral (Black-Scholes) value of stock options received during the year (with a 70% discount applied to the time to maturity)	Proprietary compensation consultant data
<i>CEO Compensation Mix, Tax Director Compensation Mix, GC Compensation Mix, and CFO Compensation Mix</i>	ratio of variable compensation (i.e., bonus, restricted stock and stock options) to total compensation.	Proprietary compensation consultant data
<i>CEO Bonus Mix, Tax Director Bonus Mix, GC Compensation Mix, and CFO Bonus Mix</i>	ratio of the annual bonus to total compensation.	Proprietary compensation consultant data
<i>Book-Tax Gap “BTG”</i>	The book-tax gap is the difference between pre-tax book income and taxable income	Compustat PI less TXFED/0.35 less PIFO plus ΔTLCF
<i>Scaled Book-Tax Gap</i>	<i>Book-Tax Gap</i> Scaled by average <i>Total Assets</i>	Compustat <i>BTG</i> divided by average AT
<i>Financial ETR</i>	the financial effective tax rate for the year defined as total income tax expense scaled by pre-tax income	Compustat TXT / PI
<i>Current ETR</i>	current effective tax rate defined as total income tax expense less deferred income tax expense scaled by pre-tax income	Compustat ((TXT – TXDI) / PI)
<i>Deferred ETR</i>	deferred effective tax rate defined as deferred income tax expense scaled by pre-tax income	Compustat (TXDI / PI)
<i>Cash ETR</i>	the cash effective tax rate for the year defined as the sum of total income taxes paid and the tax benefit of stock options scaled by pre-tax income	Compustat ((TXPD + (TXBCO + TXBCOF)) / PI)

<i>Cash ETR (w/o Option Benefit)</i>	cash effective tax rate excluding the tax benefit of stock options	Compustat TXPD/ PI
<i>Cash ETR (3 Year)</i>	three-year Cash ETRs	3 years leading
<i>Pre-tax Book Income</i>	pre-tax income	Compustat PI
<i>Taxable Income</i>	current federal tax expense grossed up by the maximum federal statutory tax rate plus foreign pre-tax income less the change in the firm's net operating loss carryforward	Compustat TXFED/0.35 + PIFO - ΔTLCF
<i>Taxable Income (less Option Benefit)</i>	taxable income less the tax benefit of stock options grossed up by 35%	TXFED/0.35 – (TXBCO + TXBCOF)/0.35 + PIFO - ΔTLCF
<i>Cash Flow from Operations</i>	operating cash flows	Compustat OANCF
<i>Tax Benefit of Stock Options</i>	is the tax benefit of stock options not included in income.	Hand collection from 2002 to 2004, Compustat TXBCO + TXBCOF
<i>DTAX</i>	Excess permanent differences as defined in Frank et al (2009)	Compustat
<i>SHELTER</i>	Probability that the firm engages in a tax shelter as defined in Wilson (2009)	Compustat <i>Tax Shelter</i> = $-4.86 + 5.20 * BookTax\ Differences + 4.08 * Discretionary\ Accruals - 1.41 * Leverage + 0.76 * Size + 3.51 * ROA + 1.72 * ForeignIncome + 2.42 * R\&D$
<i>Market-to-Book Ratio</i>	market capitalization over the book value of Total Shareholders' Equity	Compustat (CSHO * PRCC_F) / (AT – LT)
<i>Market Capitalization</i>	the number of common shares outstanding multiplied by the price per share at the fiscal year end	Compustat CSHO * PRCC_F
<i>Revenue</i>	total net sales	Compustat SALE
<i>Return on Assets</i>	net income (or loss) scaled by beginning total assets	Compustat NI _t / AT _{t-1})
<i>Prior Year's Return</i>	cumulative return on the firm's stock price over the previous year	CRSP RET

<i>Std. ROA</i>	standard deviation of Return on Assets over the previous five fiscal years	Compustat NI_t / AT_{t-1})
<i>Prior Year's Volatility</i>	the volatility of the firm's monthly stock returns over the previous year	CRSP RET
<i>Leverage</i>	long-term debt over total assets	Compustat LT / AT
<i>Change in Goodwill</i>	the annual change in goodwill if greater than 0; zero otherwise	Compustat ($\Delta GDWL / \text{Avg AT}$)
<i>New Investment</i>	the annual investment as described in Richardson (2007) and defined as Research and Development expense plus Capital Expenditures plus Acquisitions minus Sale of Property minus Depreciation all scaled by average Total Assets	Compustat $((XRD + CAPX + ACQ - SPPE - DPC) / \text{Avg. AT})$
<i>Foreign Assets</i>	is estimated foreign assets using the methodology describes in Oler et al. (2007) over Total Assets	Compustat
<i>Audit Fees</i>	the total annual audit fees (in \$ millions) paid by the firm	Audit Analytics
<i>Tax Fees</i>	the total annual tax fees (in \$ millions) paid by the firm over total assets	Audit Analytics
<i>Proportion Tax Fees</i>	the total annual tax fees (in \$ millions) paid by the firm audit fees	Audit Analytics

Table 1
Panel A: Industry Composition of Sample

Industry	Proprietary Sample		Compustat	
	Number	Frequency	Number	Frequency
1. Mining and Construction	23	1.98%	1,263	2.75%
2. Food	82	7.06%	859	1.87%
3. Textiles, Printing and Publishing	74	6.37%	1,568	3.42%
4. Chemicals	80	6.88%	955	2.08%
5. Pharmaceuticals	57	4.91%	2,719	5.93%
6. Extractive Industries	36	3.10%	1,686	3.67%
7. Durable Manufacturers	277	23.84%	12,518	27.28%
8. Computers	28	2.41%	2,338	5.09%
9. Transportation	43	3.70%	2,907	6.33%
10. Utilities	72	6.20%	1,797	3.92%
11. Retail	137	11.79%	3,595	7.83%
12. Financial Institutions	174	14.97%	6,806	14.83%
13. Insurance and Real Estate	59	5.08%	2,096	4.57%
14. Services	2	0.17%	3,862	8.42%
15. Other	18	1.55%	920	2.00%
Total	1,162	100%	45,889	100.00%

This table presents the industry classification of the proprietary sample and the Compustat database over the 2002 to 2006 period. The number and frequency of the 1,162 sample firm-year observations and the Compustat database from 2002 – 2006 are reported according to their industry classification following Barth et al (1998).

Panel B: Proportion of Sample Tax Expense and Cash Paid for Taxes

	Ratio of Proprietary Sample to Compustat			Ratio of Proprietary Sample in S&P500 to Total S&P500			
	Assets	Tax Expense	Cash Paid for Taxes	# of Firms	Assets	Tax Expense	Cash Paid for Taxes
2002	31.07%	36.05%	34.61%	50.80%	64.78%	64.67%	62.96%
2003	30.32%	32.55%	32.09%	50.80%	64.64%	61.35%	62.55%
2004	29.03%	28.35%	32.94%	51.20%	64.19%	58.61%	60.72%
2005	28.84%	28.93%	36.27%	50.60%	62.51%	57.43%	58.26%
2006	28.09%	28.45%	33.86%	49.20%	60.83%	55.26%	56.28%

Columns (1) to (3) of this table present the ratio of total assets (TA), total tax expense (TXT) and total cash paid for taxes (TXPD) for the proprietary sample to the total Compustat population of firms with data available, respectively. Columns (4) to (7) present the percentage of the S&P 500 firms in the proprietary sample, and the ratio of total assets (TA), total tax expense (TXT) and total cash paid for taxes (TXPD) for the S&P500 firms in the proprietary sample to all S&P500 firms.

Table 2
Descriptive Statistics

	Mean	Median	Standard Deviation	25 th Percentile	75 th Percentile
<u>Compensation Variables</u>					
Total CEO Compensation	13,662,000	9,839,090	13,722,377	4,670,010	17,645,995
Total Tax Director Compensation	787,727	558,714	695,740	340,909	974,043
Total GC Compensation	2,114,037	1,355,193	2,200,675	758,726	2,642,015
Total CFO Compensation	1,178,060	888,292	980,002	550,343	1,445,396
CEO Compensation Mix	0.848	0.902	0.161	0.823	0.939
Tax Director Compensation Mix	0.593	0.629	0.205	0.483	0.747
GC Compensation Mix	0.718	0.762	0.183	0.644	0.848
CFO Compensation Mix	0.682	0.722	0.181	0.604	0.811
CEO Bonus Mix	0.133	0.105	0.120	0.056	0.182
Tax Director Bonus Mix	0.138	0.128	0.090	0.078	0.189
GC Bonus Mix	0.138	0.119	0.103	0.069	0.188
CFO Bonus Mix	0.139	0.127	0.098	0.075	0.190
<u>Tax Variables</u>					
Book-Tax Gap	274	67	2,153	-41	358
Scaled Book-Tax Gap	0.050	0.016	0.340	0.000	0.043
Financial ETR	0.297	0.313	0.148	0.246	0.358
Current ETR	0.264	0.269	0.171	0.165	0.341
Deferred ETR	0.088	0.019	0.174	0.000	0.100
Cash ETR	0.287	0.233	0.262	0.123	0.338
Cash ETR (w/o Option Benefit)	0.283	0.230	0.262	0.118	0.333
Cash ETR (3 Year)	0.331	0.267	0.274	0.179	0.356
Pre-tax Book Income	1,838	683	3,730	187	1,791
Taxable Income (less Option Benefit)	1,270	446	3,178	96	1,387
Taxable Income	1,397	470	2,984	104	1,419
Cash Flow from Operations	2,283	796	4,126	271	2,140
Tax Benefit of Stock Options	44.50	0.00	374.27	0.00	11.90
DTAX	0.075	0.003	0.464	-0.041	0.078
SHELTER	0.932	0.974	0.102	0.912	0.993
<u>Financial Variables</u>					
Market-to-Book Ratio	3.38	2.42	3.39	1.62	3.79
Market Capitalization	23,555	9,173	42,365	3,060	21,329
Revenue	17,817	8,211	31,817	3,183	17,854
Return on Assets	0.052	0.049	0.066	0.016	0.090
Prior Year's Return	0.093	0.128	0.329	-0.021	0.257
Std. ROA	0.159	0.128	0.144	0.065	0.203
Prior Year's Volatility	0.008	0.004	0.014	0.002	0.008
Leverage	0.202	0.184	0.132	0.104	0.285
<u>Additional Control Variables</u>					
Change in Goodwill	0.027	0.001	0.072	0	0.014
New Investment	0.038	0.020	0.065	0.001	0.055
Foreign Assets	0.268	0.166	0.313	0.000	0.458
Audit Fees	7,154	4,140	11,289	1,963	8,127
Tax Fees	0.159	0.067	0.221	0.013	0.222
Proportion Tax Fees	0.183	0.137	0.164	0.050	0.271

This table presents descriptive statistics for the sample of 985 firm year observations for which we have all of the variables in the table. All variables are as defined in Appendix A.

Table 3**Panel A: Economic Determinants of Executive Compensation Levels**

	Chief Executive Officer	Tax Director	General Counsel	Chief Financial Officer
Intercept	12.551*** (27.78)	9.907*** (34.04)	10.727*** (37.6)	10.78*** (46.95)
Market-to-Book	-0.010 (-0.87)	0.000 (0.03)	0.004 (0.40)	-0.002 (-0.22)
Log(Market Cap)	0.377*** (11.12)	0.362*** (18.4)	0.305*** (10.90)	0.306*** (15.72)
Return-on-Assets	0.798 (1.16)	-0.353 (-0.89)	0.273 (0.50)	0.262 (0.61)
Std. Dev. ROA	-0.145 (-0.59)	0.037 (0.26)	0.391** (2.00)	-0.035 (-0.26)
Leverage	0.439 (1.45)	0.095 (0.48)	0.091 (0.35)	0.453** (2.39)
Return	-0.185* (-1.80)	-0.19*** (-3.16)	-0.143* (-1.73)	-0.168** (-2.20)
Volatility	-5.009* (-1.75)	-0.168 (-0.13)	0.181 (0.07)	-0.797 (-0.40)
Nobs	985	985	985	985
Adjusted R ²	31.9%	46.1%	28.1%	37.8%

Panel B: Economic Determinants of Executive Compensation Mix

	Chief Executive Officer	Tax Director	General Counsel	Chief Financial Officer
Intercept	0.501*** (7.65)	-0.146* (-1.93)	0.139** (1.96)	0.124* (1.93)
Market-to-Book	0.001 (0.37)	0.002 (1.00)	0.004* (1.85)	0.001 (0.31)
Log(Market Cap)	0.037*** (7.56)	0.077*** (13.54)	0.049*** (8.64)	0.055*** (10.78)
Return-on-Assets	0.118 (1.08)	0.159 (1.49)	0.221* (1.91)	0.273** (2.43)
Std. Dev. ROA	-0.019 (-0.37)	-0.012 (-0.28)	0.016 (0.28)	-0.021 (-0.56)
Leverage	0.006 (0.13)	-0.024 (-0.46)	-0.004 (-0.08)	0.050 (1.09)
Return	-0.011 (-0.50)	-0.046** (-2.49)	-0.029 (-1.39)	-0.035* (-1.68)
Volatility	-1.262** (-2.39)	-1.043** (-2.56)	-0.796 (-1.39)	-1.206** (-2.35)
Nobs	985	985	985	985
Adjusted R ²	19.7%	38.1%	24.9%	31.1%

This table presents the estimates of regressions of the economic determinants of executive compensation where the dependent variable is either the natural logarithm of the level of total annual compensation (Panel A) or Compensation Mix (Panel B) for the CEO, Tax Director, General Counsel and CFO, respectively. The model in Panel B is estimated with a doubly-censored Tobit specification since the dependent variable lies in the interval [0,1]. The remaining variables are as defined in the Appendix. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 4

Determinants of the Book-Tax Gap and Components

	Compensation Level				Compensation Mix			
	BTG	PBI	TI	Diff	BTG	PBI	TI	Diff
Intercept	0.122* (1.66)	-0.100** (-2.19)	-0.097* (-1.81)	0.010 (0.93)	0.122* (1.69)	-0.100** (-2.27)	-0.097** (-2.02)	0.010 (0.93)
CEO Incentives	-0.002 (-0.40)	-0.006** (-2.11)	-0.004 (-1.50)	0.520 (0.47)	-0.051 (-1.01)	-0.029* (-1.78)	-0.006 (-0.24)	1.160 (0.28)
Tax Director Incentives	-0.003 (-0.44)	0.001 (0.26)	0.004 (0.72)	0.300 (0.58)	-0.023 (-0.91)	0.008 (0.60)	0.026 (1.56)	1.430 (0.23)
General Counsel Incentives	0.004 (1.07)	0.002 (0.74)	0.000 (-0.06)	0.630 (0.43)	0.055* (1.80)	-0.003 (-0.16)	-0.032* (-1.72)	2.980* (0.08)
CFO Incentives	-0.004 (-0.70)	0.003 (0.97)	0.003 (0.76)	0.010 (0.91)	-0.003 (-0.09)	0.008 (0.40)	0.011 (0.55)	0.030 (0.87)
Operating Cash Flow	0.187** (2.30)	0.856*** (13.24)	0.592*** (10.58)	20.36*** (0.00)	0.185** (2.27)	0.858*** (13.60)	0.596*** (11.14)	22.27*** (0.00)
Std. Dev. ROA	0.017 (0.54)	0.025 (0.69)	0.005 (0.24)	0.490 (0.48)	0.018 (0.56)	0.025 (0.71)	0.004 (0.19)	0.510 (0.47)
Log(Market Cap)	-0.003 (-0.91)	0.012*** (4.78)	0.010*** (4.26)	1.050 (0.31)	-0.003 (-0.91)	0.012*** (5.02)	0.010*** (4.24)	1.090 (0.30)
Leverage	-0.015 (-0.39)	-0.012 (-0.44)	-0.030 (-1.28)	0.700 (0.40)	-0.015 (-0.39)	-0.011 (-0.43)	-0.029 (-1.30)	0.560 (0.45)
Change in Goodwill	0.071 (1.28)	-0.034 (-0.94)	-0.066 (-1.59)	1.010 (0.32)	0.068 (1.21)	-0.036 (-0.98)	-0.067 (-1.55)	0.950 (0.33)
New Investment	-0.069 (-1.04)	0.092 (1.48)	0.095* (1.90)	0.000 (0.96)	-0.067 (-0.99)	0.094 (1.50)	0.096* (1.86)	0.000 (0.98)
Foreign Assets	0.007 (0.70)	0.005 (0.57)	-0.006 (-0.70)	2.190 (0.14)	0.006 (0.55)	0.006 (0.60)	-0.004 (-0.50)	1.730 (0.19)
Proportion Tax Fees	0.014 (0.59)	0.027* (1.71)	0.015 (0.83)	0.540 (0.46)	0.016 (0.66)	0.028* (1.87)	0.016 (0.88)	0.530 (0.46)
Tax Fees	-0.059* (-1.65)	-0.033 (-1.49)	0.011 (0.42)	4.52** (0.03)	-0.061* (-1.65)	-0.035 (-1.60)	0.010 (0.42)	4.62** (0.03)
Nobs	985	985	985		985	985	985	
Adjusted R ²	7.4%	59.1%	48.8%		7.9%	59.0%	49.0%	

This table presents the estimates of equation (2) where the dependent variable in the first column is the *Book-Tax Gap (BTG)*. The second and third columns present results when the *Book-Tax Gap* is disaggregated into its two components, *Pre-tax Book Income (PBI)* and *Taxable Income (TI)*, and the equations are jointly estimated using Seemingly Unrelated Regression. The fourth column, *Diff*, presents the results of a chi-square test of the difference between the estimated coefficients in the *PBI* and *TI* models. *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as either the excess level of total compensation or the excess level of compensation mix, which is the residual from estimating equation (1) where either the natural logarithm of total annual compensation or compensation mix is the dependent variable. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 5

Panel A: Determinants of the Financial Effective Tax Rate (Excess Compensation Levels)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.323*** (4.69)	0.329*** (4.85)	0.324*** (4.71)	0.329*** (4.82)	0.331*** (4.87)	0.33*** (4.86)
CEO Incentives	-0.001 (-0.20)	-0.006 (-0.85)				
Tax Director Incentives	-0.025** (-2.26)		-0.023** (-2.47)			
General Counsel Incentives	0.000 (0.00)			-0.006 (-0.92)		
CFO Incentives	0.005 (0.52)				-0.008 (-0.88)	
Return on Assets	0.531*** (4.70)	0.541*** (4.82)	0.533*** (4.75)	0.542*** (4.81)	0.546*** (4.88)	0.546*** (4.87)
Std. Dev. ROA	-0.069 (-1.38)	-0.068 (-1.36)	-0.069 (-1.38)	-0.068 (-1.36)	-0.067 (-1.35)	-0.067 (-1.34)
Log(Market Cap)	-0.004 (-0.74)	-0.005 (-0.88)	-0.004 (-0.77)	-0.005 (-0.89)	-0.005 (-0.93)	-0.006 (-0.95)
Leverage	-0.026 (-0.46)	-0.030 (-0.54)	-0.026 (-0.48)	-0.029 (-0.52)	-0.030 (-0.53)	-0.028 (-0.50)
Change in Goodwill	-0.001 (-0.02)	0.001 (0.02)	-0.001 (-0.01)	0.002 (0.03)	0.002 (0.04)	0.003 (0.04)
New Investment	0.053 (0.55)	0.056 (0.58)	0.053 (0.54)	0.056 (0.58)	0.054 (0.56)	0.054 (0.56)
Foreign Assets	0.005 (0.24)	0.002 (0.11)	0.005 (0.25)	0.003 (0.14)	0.003 (0.14)	0.002 (0.11)
Proportion Tax Fees	-0.085** (-2.41)	-0.097*** (-2.76)	-0.086** (-2.44)	-0.096*** (-2.70)	-0.098*** (-2.78)	-0.097*** (-2.75)
Tax Fees	0.046 (0.96)	0.058 (1.21)	0.046 (0.96)	0.057 (1.19)	0.057 (1.18)	0.057 (1.19)
Nobs	985	985	985	985	985	985
Adjusted R ²	19.0%	18.0%	19.0%	18.0%	18.0%	18.0%

This table presents the estimates of equation (3) where the dependent variable *Financial ETR* is defined as the financial effective tax rate for the year defined as total income tax expense scaled by pre-tax income (Compustat TXT / PI). *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as the excess level of total compensation, which is the residual from estimating equation (1) where the natural logarithm of total annual compensation is the dependent variable. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 5 (cont'd)

Panel B: Determinants of the Financial Effective Tax Rate (Excess Compensation Mix)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.329*** (4.80)	0.33*** (4.84)	0.33*** (4.83)	0.33*** (4.83)	0.332*** (4.88)	0.33*** (4.86)
CEO Incentives	-0.010 (-0.19)	-0.043 (-0.92)				
Tax Director Incentives	-0.072* (-1.89)		-0.071* (-1.94)			
General Counsel Incentives	-0.013 (-0.27)			-0.046 (-1.01)		
CFO Incentives	0.020 (0.41)				-0.045 (-0.95)	
Return on Assets	0.535*** (4.74)	0.542*** (4.81)	0.537*** (4.78)	0.541*** (4.81)	0.545*** (4.86)	0.546*** (4.87)
Std. Dev. ROA	-0.068 (-1.35)	-0.068 (-1.36)	-0.067 (-1.35)	-0.068 (-1.36)	-0.067 (-1.35)	-0.067 (-1.34)
Log(Market Cap)	-0.005 (-0.88)	-0.005 (-0.9)	-0.005 (-0.91)	-0.005 (-0.92)	-0.006 (-0.96)	-0.006 (-0.95)
Leverage	-0.029 (-0.53)	-0.030 (-0.55)	-0.029 (-0.53)	-0.030 (-0.54)	-0.031 (-0.56)	-0.028 (-0.5)
Change in Goodwill	-0.001 (-0.02)	-0.002 (-0.03)	0.000 (0.00)	0.001 (0.02)	0.003 (0.04)	0.003 (0.04)
New Investment	0.064 (0.66)	0.062 (0.63)	0.062 (0.65)	0.063 (0.65)	0.058 (0.6)	0.054 (0.56)
Foreign Assets	0.004 (0.22)	0.003 (0.13)	0.004 (0.20)	0.004 (0.22)	0.003 (0.14)	0.002 (0.11)
Proportion Tax Fees	-0.096*** (-2.76)	-0.096*** (-2.71)	-0.097*** (-2.79)	-0.098*** (-2.74)	-0.100*** (-2.87)	-0.097*** (-2.75)
Tax Fees	0.056 (1.19)	0.057 (1.18)	0.056 (1.19)	0.059 (1.24)	0.059 (1.24)	0.057 (1.19)
Nobs	985	985	985	985	985	985
Adjusted R ²	19.0%	18.0%	19.0%	18.0%	18.0%	18.0%

This table presents the estimates of equation (3) where the dependent variable *Financial ETR* is defined as the financial effective tax rate for the year defined as total income tax expense scaled by pre-tax income (Compustat TXT / PI). *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as excess compensation mix, which is the residual from estimating equation (1) where the ratio of variable annual compensation to total annual compensation is the dependent variable. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 6

Panel A: Determinants of the Cash Effective Tax Rate (Excess Compensation Levels)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.228** (2.53)	0.234*** (2.64)	0.231** (2.55)	0.237*** (2.68)	0.236*** (2.67)	0.236*** (2.66)
CEO Incentives	-0.015 (-1.48)	-0.011 (-1.12)				
Tax Director Incentives	-0.028 (-1.47)		-0.019 (-1.26)			
General Counsel Incentives	0.013 (1.26)			0.005 (0.49)		
CFO Incentives	0.021 (1.25)				0.003 (0.23)	
Return on Assets	0.581*** (3.45)	0.591*** (3.48)	0.59*** (3.46)	0.604*** (3.56)	0.601*** (3.52)	0.601*** (3.52)
Std. Dev. ROA	-0.148** (-2.45)	-0.147** (-2.45)	-0.148** (-2.47)	-0.145** (-2.44)	-0.146** (-2.45)	-0.146** (-2.45)
Log(Market Cap)	-0.003 (-0.40)	-0.004 (-0.46)	-0.004 (-0.44)	-0.005 (-0.56)	-0.005 (-0.54)	-0.005 (-0.54)
Leverage	-0.015 (-0.19)	-0.022 (-0.27)	-0.017 (-0.21)	-0.017 (-0.21)	-0.017 (-0.21)	-0.018 (-0.22)
Change in Goodwill	0.243* (1.93)	0.247* (1.95)	0.246* (1.95)	0.25** (1.98)	0.249** (1.97)	0.249** (1.97)
New Investment	-0.443*** (-3.49)	-0.438*** (-3.46)	-0.442*** (-3.46)	-0.443*** (-3.50)	-0.441*** (-3.48)	-0.441*** (-3.47)
Foreign Assets	0.002 (0.08)	0.001 (0.05)	0.004 (0.14)	0.001 (0.05)	0.001 (0.05)	0.002 (0.06)
Proportion Tax Fees	-0.074 (-1.39)	-0.087* (-1.67)	-0.079 (-1.47)	-0.088* (-1.68)	-0.087* (-1.66)	-0.087* (-1.66)
Tax Fees	0.105 (1.32)	0.117 (1.48)	0.106 (1.33)	0.116 (1.47)	0.116 (1.47)	0.116 (1.47)
Nobs	985	985	985	985	985	985
Adjusted R ²	53.0%	50.0%	50.0%	49.0%	49.0%	49.0%

This table presents the estimates of equation (3) where the dependent variable *Cash ETR* is the cash effective tax rate for the year defined as the sum of total income taxes paid and the tax benefit of stock options scaled by pre-tax income $((TXPD + (TXBCO + TXBCOF)) / PI)$. *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as the excess level of total compensation. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 6 (cont'd)

Panel B: Determinants of the Cash Effective Tax Rate (Excess Compensation Mix)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.23*** (2.60)	0.236*** (2.65)	0.236*** (2.64)	0.236*** (2.66)	0.235*** (2.66)	0.236*** (2.66)
CEO Incentives	-0.125 (-1.58)	-0.066 (-0.94)				
Tax Director Incentives	-0.052 (-0.72)		-0.026 (-0.46)			
General Counsel Incentives	0.028 (0.33)			-0.007 (-0.11)		
CFO Incentives	0.115 (1.39)				0.021 (0.32)	
Return on Assets	0.587*** (3.44)	0.593*** (3.46)	0.598*** (3.50)	0.600*** (3.50)	0.601*** (3.52)	0.601*** (3.52)
Std. Dev. ROA	-0.146** (-2.42)	-0.146** (-2.44)	-0.146** (-2.46)	-0.146** (-2.45)	-0.146** (-2.45)	-0.146** (-2.45)
Log(Market Cap)	-0.004 (-0.43)	-0.004 (-0.49)	-0.004 (-0.53)	-0.005 (-0.54)	-0.005 (-0.54)	-0.005 (-0.54)
Leverage	-0.018 (-0.22)	-0.022 (-0.27)	-0.019 (-0.23)	-0.018 (-0.22)	-0.017 (-0.20)	-0.018 (-0.22)
Change in Goodwill	0.235* (1.85)	0.243* (1.91)	0.248* (1.96)	0.249** (1.97)	0.249** (1.97)	0.249** (1.97)
New Investment	-0.429*** (-3.36)	-0.429*** (-3.38)	-0.438*** (-3.48)	-0.44*** (-3.44)	-0.443*** (-3.49)	-0.441*** (-3.47)
Foreign Assets	0.001 (0.05)	0.002 (0.08)	0.002 (0.08)	0.002 (0.07)	0.001 (0.05)	0.002 (0.06)
Proportion Tax Fees	-0.078 (-1.47)	-0.087 (-1.64)	-0.087* (-1.66)	-0.088* (-1.66)	-0.086 (-1.63)	-0.087* (-1.66)
Tax Fees	0.108 (1.37)	0.116 (1.46)	0.115 (1.46)	0.116 (1.47)	0.115 (1.46)	0.116 (1.47)
Nobs	985	985	985	985	985	985
Adjusted R ²	52.0%	50.0%	49.0%	49.0%	49.0%	49.0%

This table presents the estimates of equation (3) where the dependent variable *Cash ETR* is the cash effective tax rate for the year defined as the sum of total income taxes paid and the tax benefit of stock options scaled by pre-tax income $((TXPD + (TXBCO + TXBCOF)) / PI)$. *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as the excess level of compensation mix. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 7

Shelter (Excess Compensation Level)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.570*** (13.26)	0.567*** (13.07)	0.569*** (13.26)	0.568*** (13.03)	0.567*** (13.04)	0.566*** (13.04)
CEO Incentives	-0.001 (-0.16)	0.000 (0.00)				
Tax Director Incentives	0.004 (0.70)		0.006 (1.08)			
General Counsel Incentives	0.005 (1.17)			0.006 (1.41)		
CFO Incentives	-0.001 (-0.13)				0.003 (0.56)	
Return on Assets	0.267*** (2.59)	0.263** (2.54)	0.265** (2.56)	0.265** (2.56)	0.262** (2.51)	0.262** (2.52)
Std. Dev. ROA	-0.07** (-2.19)	-0.071** (-2.21)	-0.071** (-2.20)	-0.070** (-2.19)	-0.071** (-2.20)	-0.071** (-2.21)
Log(Market Cap)	0.034*** (8.56)	0.034*** (8.56)	0.034*** (8.52)	0.034*** (8.51)	0.034*** (8.56)	0.034*** (8.58)
Leverage	0.000 (-0.05)	0.000 (-0.05)	0.000 (-0.11)	0.000 (-0.01)	0.000 (-0.09)	0.000 (-0.09)
Change in Goodwill	-0.002* (-1.87)	-0.002* (-1.86)	-0.002* (-1.88)	-0.002* (-1.88)	-0.002* (-1.88)	-0.002* (-1.87)
New Investment	-0.08* (-1.65)	-0.079 (-1.64)	-0.078 (-1.61)	-0.081* (-1.68)	-0.079 (-1.63)	-0.079 (-1.63)
Foreign Assets	0.052*** (4.67)	0.053*** (4.73)	0.052*** (4.66)	0.052*** (4.69)	0.053*** (4.71)	0.053*** (4.72)
Proportion Tax Fees	-0.003 (-0.12)	0.000 (-0.02)	-0.004 (-0.14)	-0.001 (-0.04)	0.000 (-0.01)	0.000 (-0.01)
Tax Fees	0.010 (0.28)	0.007 (0.20)	0.010 (0.31)	0.007 (0.21)	0.007 (0.21)	0.007 (0.20)
Nobs	985	985	985	985	985	985
Adjusted R ²	43.5%	43.5%	43.6%	43.6%	43.5%	43.5%

This table presents the estimates of equation (5) where the dependent variable *Shelter* is the Wilson's (2009) measure of the probability that the firm engages in a tax shelter. *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as the excess level of total compensation. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 8

DTAX (Excess Compensation Level)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.378 (1.45)	0.371 (1.43)	0.364 (1.40)	0.375 (1.44)	0.370 (1.43)	0.372 (1.43)
CEO Incentives	0.011 (0.47)	-0.002 (-0.08)				
Tax Director Incentives	-0.008 (-0.20)		-0.017 (-0.51)			
General Counsel Incentives	0.024 (0.89)			0.011 (0.44)		
CFO Incentives	-0.057* (-1.78)				-0.042 (-1.54)	
Return on Assets	-0.211 (-0.43)	-0.231 (-0.47)	-0.240 (-0.49)	-0.224 (-0.45)	-0.229 (-0.46)	-0.230 (-0.47)
Std. Dev. ROA	0.016 (0.06)	0.012 (0.05)	0.010 (0.04)	0.015 (0.06)	0.010 (0.04)	0.012 (0.05)
Log(Market Cap)	-0.003 (-0.15)	-0.001 (-0.06)	0.000 (-0.02)	-0.002 (-0.11)	-0.001 (-0.04)	-0.001 (-0.07)
Leverage	0.000 (-0.55)	0.000 (-0.74)	0.000 (-0.71)	0.000 (-0.69)	0.000 (-0.71)	0.000 (-0.73)
Change in Goodwill	-0.006 (-1.13)	-0.006 (-1.19)	-0.006 (-1.18)	-0.006 (-1.19)	-0.006 (-1.15)	-0.006 (-1.19)
New Investment	0.534 (1.57)	0.544 (1.61)	0.542 (1.61)	0.541 (1.60)	0.544 (1.61)	0.544 (1.61)
Foreign Assets	-0.244*** (-3.02)	-0.246*** (-3.13)	-0.245*** (-3.11)	-0.247*** (-3.13)	-0.244*** (-3.05)	-0.246*** (-3.13)
Proportion Tax Fees	0.022 (0.18)	0.024 (0.21)	0.033 (0.28)	0.023 (0.19)	0.022 (0.19)	0.024 (0.21)
Tax Fees	-0.072 (-0.43)	-0.062 (-0.38)	-0.072 (-0.44)	-0.062 (-0.38)	-0.066 (-0.41)	-0.062 (-0.38)
Nobs	985	985	985	985	985	985
Adjusted R ²	5.9%	5.9%	5.9%	5.9%	6.1%	6.0%

This table presents the estimates of equation (4) where the dependent variable *DTAX* is excess permanent differences as defined in Frank et al. (2009). *Incentives* for the CEO, Tax Director, General Counsel and CFO are measured as the excess level of total compensation. The remaining variables are as defined in Appendix A. Year and industry indicators are included but unreported. Standard errors are calculated based on two-way clustering by firm and year. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.

Table 9
Propensity Score Matched Pair Analysis

Panel A: Differences in Financial ETR

Treatment					Mean	Median
	Wilcoxon	p-value	t-statistic	p-value	Difference in Financial ETR	Difference in Financial ETR
CEO Compensation	0.557	0.577	-0.446	0.655	-0.003	0.005
Tax Director Compensation	-4.050***	0.000	-3.519***	0.000	-0.029	-0.018
General Counsel Compensation	0.321	0.749	0.202	0.840	0.001	0.000
CFO Compensation	-0.890	0.373	-0.230	0.818	-0.002	-0.006
CEO Comp Mix	-0.477	0.633	-1.224	0.221	-0.009	0.000
Tax Director Comp Mix	-2.204**	0.028	-2.223**	0.027	-0.019	-0.011
General Counsel Comp Mix	0.275	0.784	0.125	0.901	0.001	0.000
CFO Comp Mix	-1.389	0.165	-0.734	0.463	-0.005	-0.008

Panel B: Differences in Cash ETR

Treatment					Mean	Median
	Wilcoxon	p-value	t-statistic	p-value	Difference in Cash ETR	Difference in Cash ETR
CEO Compensation	0.062	0.951	0.402	0.688	0.005	-0.003
Tax Director Compensation	0.679	0.497	-0.004	0.997	0.000	0.015
General Counsel Compensation	-0.233	0.816	-0.712	0.477	-0.009	0.000
CFO Compensation	0.920	0.357	1.567	0.118	0.020	0.000
CEO Comp Mix	-1.381	0.167	-1.079	0.281	-0.014	-0.009
Tax Director Comp Mix	0.110	0.912	0.180	0.857	0.002	0.000
General Counsel Comp Mix	0.592	0.554	0.687	0.492	0.009	0.000
CFO Comp Mix	0.989	0.323	0.793	0.428	0.010	0.011

This table presents the results of the difference in Financial ETR (Panel A) and Cash ETR (Panel B) between the matched pairs of firms for different treatments which are either the level or mix of compensation for the CEO, Tax Director, General Counsel and CFO. The first column presents the treatment for which we modeled the conditional probability of having a certain level of the treatment (conditional on economic and tax planning characteristics) and then matched firms with the most similar conditional probability of treatment but the largest difference in the observed level of treatment. The second and third columns present a Wilcoxon statistic of the rank-sum difference in the median ETR between the matched pairs of firms and the corresponding p-value (two-sided). The fourth and fifth columns present a t-statistic for a test of the difference in the mean ETR between the matched pairs and the associated p-value (two-sided). The sixth and seventh columns present the mean and median difference in Financial (Panel A) and Cash (Panel B) ETR between the matched pairs. *, **, and *** denote statistical significance (two-sided) at the 10%, 5% and 1% levels, respectively.