DO MANAGERS RESPOND TO TAX AVOIDANCE INCENTIVES BY INVESTING

IN THE TAX FUNCTION? EVIDENCE FROM TAX DEPARTMENTS

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ZHONGYANG LI

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Student: Zhongyang Li

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David Guenther   Co-Chairperson
Linda Krull   Co-Chairperson
Kyle Peterson   Core Member
Van Kolpin   Institutional Representative

and

Kate Mondloch   Interim Vice Provost and Dean of the Graduate School

Original approval signatures are on file with the University of Oregon Graduate School.

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DISSERTATION ABSTRACT

Zhongyang Li

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        While prior literature examines the role of incentives in motivating top managers to engage in corporate tax avoidance, there is little evidence on the specific actions that managers take in response to these incentives. Motivated by the premise that a manager can influence a firm's tax activities by emphasizing the tax function, I investigate whether four specific tax avoidance incentives studied in prior literature (financial constraints, equity risk incentives, hedge fund interventions, and analyst cash flow forecasts) induce managers to make investments in the firm's tax department. Using a dataset of tax employees collected from the website LinkedIn, I find evidence that each incentive is significantly associated with an increase in the number of employees within the tax department. This association is stronger among higher ranked employees and employees with prior tax department experience. In supplementary analyses, I find that some incentives also induce managers to pay higher tax fees to the firm's auditor and engage in tax lobbying. Overall, my findings are consistent with the premise that managers invest resources in the tax function when incentivized to avoid taxes. My study also provides assurance that the association between incentives and effective tax rates documented in prior studies is reflective of intentional tax avoidance behavior.

CURRICULUM VITAE

NAME OF AUTHOR: Zhongyang Li

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

> University of Oregon, Eugene
> University of Waterloo, Waterloo

DEGREES AWARDED:

> Doctor of Philosophy, Accounting, 2020, University of Oregon
> Master of Mathematics, Statistics, 2015, University of Waterloo
> Master of Accounting, 2014, University of Waterloo
> Bachelor of Mathematics, Mathematics and Chartered Accountancy, 2014,
>   University of Waterloo

AREAS OF SPECIAL INTEREST:

> Taxation
> Executive Compensation

PROFESSIONAL EXPERIENCE:

> Graduate Employee, School of Accounting, University of Oregon, Eugene,
>   Oregon, 2015-2020

GRANTS, AWARDS, AND HONORS:

> Graduate Teaching Fellow, Accounting, 2015-2020

> AAA/Deloitte Foundation/J. Michael Cook Doctoral Consortium Fellow, 2018

ACKNOWLEDGMENTS

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CHAPTER I

INTRODUCTION

A large subset of the tax avoidance literature examines incentives that top managers (CEOs and CFOs) have to engage in corporate tax avoidance. The most common empirical approach in these studies is to examine the relationship between a specific incentive and tax planning outcomes of the firm, such as effective tax rates (ETRs) or book-tax differences (BTDs). However, one drawback of this approach is that it provides no evidence regarding the specific actions that managers take in response to these incentives[1]. Managers are unlikely to involve themselves directly in developing or implementing tax strategies given that they are rarely tax experts. Instead, the literature argues that they have a 'tone at the top' effect on the firm's tax activities, which includes emphasizing the tax function when allocating resources across different functional areas of the firm (e.g. Dyreng, Hanlon, and Maydew (2010)). Therefore, while prior studies focus on how tax avoidance incentives affect *outputs* of the tax function (e.g. cash tax savings), managers will likely respond to these incentives by allocating additional resources to increase *inputs* into the tax function. Empirically, demonstrating a link between tax avoidance incentives and tax function inputs will provide stronger evidence regarding the effectiveness of these incentives. However, while tax function outputs are observable through publicly available financial statements, inputs are more difficult to observe.

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[1] Note that the word 'action' in this context does not refer to the implementation of a specific tax strategy, which are likely actions taken by the tax department. Rather, it refers to actions that are within the control of top executives who do not have specific knowledge of tax planning, such as investing in the tax department or paying auditors for tax services.

In this study, I directly examine inputs into the tax function by constructing a panel dataset of tax department employees collected from the professional networking website *LinkedIn*. Given widespread usage of the website among professionals, including tax accountants, it provides a strong estimate of the number of personnel employed within a firm's tax department. Validation tests using comparisons with tax department surveys confirm that *LinkedIn* is a good data source. I hypothesize that, if tax avoidance incentives encourage managers to engage in tax planning, then it should lead to managers distributing more resources to the tax function. Since prior studies show that the majority of tax function resources are allocated to employing personnel (Mills, Erickson, and Maydew (1998)), I predict that these incentives should lead to an increase in the number of tax personnel employed within the tax department. I use my dataset to test this prediction.

I identify four measures of tax avoidance incentives from the existing literature. Prior studies argue that managers with a greater need for additional cash flows will be more inclined to pursue tax avoidance activities as a means to reduce tax payments and increase the firm's cash balance. Following this argument, the literature finds that financial constraints[2] (e.g. Edwards, Schwab and Shevlin (2016)) and analyst cash flow forecasts (Ayers, Call and Schwab (2018)) both incentivize managers to engage in tax avoidance in order to generate additional cash to finance operations and meet cash flow forecasts respectively. In addition, prior literature argues, under the assumption that managers view tax avoidance as risky and effort-intensive, that encouraging managers to engage in risky activities or exert effort can incentivize them to pursue tax avoidance. With respect to risk,

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[2] One point of contention is that financially constrained firms may lack the resources to hire additional tax personnel, contrary to my prediction. However, Graham, Harvey, and Puri (2015) find that managers of financially constrained firms heavily consider cash flow timing when making capital allocation decisions. Since the tax function's outputs (tax savings) are relatively quick compared to long-term investments, managers may allocate resources to the tax function when financially constrained, as opposed to divisions such as R&D.

Rego and Wilson (2012) find that providing managers with equity risk incentives (i.e. stock options) is an effective tax avoidance incentive. With respect to effort, Cheng, Huang, Li and Stanfield (2012) find that activist hedge funds, through monitoring activities, can incentivize managers to exert the necessary effort to engage in tax planning.

I predict that each of these four factors, if effective as a tax planning incentive, is positively associated with tax department investments. To test this prediction, I construct a firm-year level measure of corporate tax department size by aggregating all US-based tax employees on *LinkedIn* who disclosed that they were working in the firm during the year (although I exclude employees working in a non-income tax role such as sales or property taxes). I scale this measure by the total number of employees to create my dependent variable for tax department investments, which represents the proportion of employees in the firm who work within the tax department[3]. Using variables to capture each of the four aforementioned incentives, I estimate the relationship between each incentive and the firm's tax department investments, controlling for other determinants of tax department size and using firm fixed effects so that only within-firm variation is exploited. Details of variable definitions are presented in Appendix A.

Overall, my main results support my primary hypotheses. First, using one of four index measures to capture financial constraints[4], and using the CEO or CFO's portfolio 'vega' to capture equity risk incentives, I find a significantly positive relationship between

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[3] I choose to scale tax department size by total employees for three reasons: First, it is consistent with prior literature (i.e. Chen et al. (2020), Ege, Hepfer, and Robinson (2020)). Second, it allows both the numerator and denominator to be denoted in the same unit of measurement, allowing the measure to be interpreted easily and preventing confounding factors such as inflation. Finally, there is intuitive appeal in the measure conceptually, as it examines how much of the firm's *human capital* investments (which are fundamentally different than tangible investments) are directed towards the tax function.

[4] The financial constraint measures used are: the Altman's Z-score, the Kaplan and Zingales KZ Index, the Whited and Wu WW Index, and the fraction of negative words in 10-K filings. Please see Appendix A for more details.

these two tax avoidance incentives and tax department investments. Next, using a difference-in-differences design with firm fixed effects, I also find that firms experience a significant increase in tax department investments after a hedge fund intervention or an analyst cash flow forecast, relative to control firms. Economic magnitudes vary substantially between these four incentives, with the average firm exhibiting a 5% to 20% increase in tax department investments depending on the incentive measure. I also find evidence that these results are stronger among firms that avoid more cash taxes in response to each incentive (see Appendix B). Overall, my results are consistent with the hypothesis that managers, in response to tax avoidance incentives, increase the resources allocated to human capital investments in the tax function.

Next, I examine the types of tax employees that managers are most likely to invest in when responding to tax avoidance incentives. I hypothesize that employees with a more developed tax planning skillset, either through experience or education, are the most attractive investments for managers incentivized to engage in tax planning. I find some evidence consistent with this hypothesis. Specifically, I find consistent evidence that increases in tax department investments are more concentrated among senior-level tax employees (e.g. tax managers or executives), as opposed to junior employees (e.g. analysts or accountants). Among senior employees, I also find consistent evidence that managers are more likely to invest in tax personnel who have prior tax department experience over personnel with only accounting firm experience. With respect to education, however, I find mixed evidence as to whether managers are more likely to invest in tax personnel who possess graduate degrees.

Finally, in supplementary tests, I examine two other actions that manager may take in response to tax avoidance incentives – tax function outsourcing and tax lobbying. Using

tax fees paid to the firm's auditor as a proxy for tax function outsourcing, I find some evidence that auditor-provided tax service fees are significantly associated with certain incentives (financial constraints and hedge fund interventions), but only in the subset of firms that do *not* have tax departments. This suggests that managers with tax planning incentives may turn to tax function outsourcing when they do not have an internal tax function. I also find some evidence that the probability that a firm engages in tax lobbying is greater when the firm is faced with certain tax avoidance incentives (equity risk incentives and analyst cash flow forecasts). Overall, these results indicate that tax department hiring is not the only avenue that managers may pursue when incentivized to engage in tax avoidance.

The findings of this study are important for several reasons. First, this study contributes to the literature examining tax avoidance incentives. Prior studies often provide evidence of the effectiveness of these incentives by showing that it reduces a firm's effective tax rates. However, this raises the question of whether these effects are reflective of intentional tax avoidance behavior, particularly in light of recent studies that question whether tax rate measures are adequately capturing tax avoidance (e.g. Guenther, Krull and Williams (2014), Edwards, Kubata and Shevlin (2018)). My study helps resolve this issue by showing that managers engage in a specific action (the employment of tax personnel) in response to these incentives. In addition, by highlighting that inputs to the tax function are sensitive to managerial incentives, I provide additional evidence of the 'tone at the top' influence that managers have over the firm's tax activities. Future studies examining whether a certain factor incentivizes managers to engage in tax avoidance may also want to consider how that incentive maps into the firm's tax function inputs, such as the number of tax personnel employed.

Second, this study contributes to the newly developed literature highlighting the role of the tax department within the firm. Despite the tax department being the most substantial investment that managers make with respect to taxes, there are few studies examining the determinants and consequences of these investments. Some exceptions include Chen, Cheng, Chow and Liu (2020), who find that firms with larger tax departments engage in more tax avoidance, and Barrios and Gallemore (2018), who find that firms hire tax employees when experiencing deteriorations in tax performance and that hiring from low-tax firms is associated with greater tax avoidance. By linking this literature to four different studies examining tax avoidance incentives, I provide additional evidence regarding *when* managers will make tax department investments.

Third, this study provides evidence supporting the argument that tax avoidance is a costly investment, as managers who are incentivized to avoid taxes will commit capital towards employing tax personnel. Prior studies (e.g. McClure (2018)) suggest that there are specific non-tax costs and operational frictions imposed by tax avoidance that discourage managers from pursuing all possible tax planning opportunities. However, the literature has not found substantial evidence that these costs are borne from reputational costs (e.g. Gallemore, Maydew and Thornock (2014)) nor increased exposure to risk (Guenther, Matsunaga and Williams (2017)). My study highlights that one cost involved in tax avoidance is the upfront cost of tax function investment, and this may help explain why some managers appear to under-exploit tax planning opportunities[5].

Finally, this study provides some evidence, in a specific setting, on how managers allocate firm resources toward different divisions within the firm. Most prior evidence on this research question is survey-based (e.g. Graham, Harvey and Puri (2015)) due to a lack of

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[5] This is commonly termed in the tax literature as the 'under-sheltering puzzle'.

disaggregated data. I provide evidence that managers allocate more resources towards the tax department when they have an increased appreciation for the outputs of that department (i.e. when they have a greater incentive to engage in tax planning and receive tax savings). This can translate to a more general finding that managers allocate more capital towards firm divisions when they assign a greater value to the outputs of that division.

CHAPTER II

HYPOTHESIS DEVELOPMENT

Tax Avoidance Incentives

Motivated by Dyreng, Hanlon and Maydew (2008), who find considerable variation in tax avoidance among US public firms, many tax studies have focused on investigating a variety of determinants of corporate tax avoidance. A large subset of this literature examines incentives that managers have to engage in tax avoidance activities. Studies find that managers requiring additional cash flow for their firms, either due to financial constraints (Edwards, Schwab and Shevlin (2016), Law and Mills (2015)) or analyst cash flow forecasts (Ayers, Call and Schwab (2018)), avoid more taxes to generate the required funds. Studies also find that components of executive compensation are effective motivators for risk and effort-averse managers to engage in tax avoidance, including equity risk incentives (Rego and Wilson (2012)), after-tax compensation (Gaertner (2014)), and labor market incentives (Kubick and Lockhart (2016)). Finally, studies show that other stakeholders, including activist hedge funds (Cheng, Huang, Li and Stanfield (2012)) and institutional shareholders (Khan, Srinivasan and Tan (2017)), may provide the necessary motivation for managers to engage in tax avoidance.

In the majority of these studies, researchers establish a direct link between a specific tax avoidance incentive faced by the manager and a measure representing the firm's tax avoidance outcomes, such as effective tax rates or book-tax differences. However, given that managers are rarely tax experts (Dyreng, Hanlon and Maydew (2010)), it is unlikely that managers with tax avoidance incentives are able to directly influence the firm's tax outcomes through exerting personal effort. Prior literature argues, however, that managers

are able to indirectly influence tax outcomes through 'tone at the top' effects, including the allocation of additional resources to the firm's tax function (e.g. Dyreng et al. (2010), Christensen, Dhaliwal, Boivie and Graffin (2014), Chi, Huang and Sanchez (2017)). Therefore, while prior studies examine the relation between incentives and tax planning outcomes, which is an *output* of the tax function, this relationship is likely driven by the manager's willingness to increase *inputs* into the firm's fax function in response to these incentives. Motivated by this argument, I investigate the relationship between tax avoidance incentives and tax function investments, with a focus on human capital investments made within the firm's tax department.

Tax Function Investments

The tax literature often frames corporate tax avoidance as an 'investment' (e.g. Kubick, Lynch, Mayberry and Omer (2015)), suggesting that a commitment of capital is required to engage in tax avoidance activities[6]. Indeed, prior literature, often using survey data, suggests that firms do incur substantial expenditures towards their tax function. For example, using a 1992 survey of large U.S. corporations on their tax planning costs, Mills, Erickson and Maydew (1998) find that firms on average spend 0.4% of their SG&A costs on their tax function, representing approximately $1.2M for the median firm in their sample. Similarly, Slemrod and Venkatesh (2002) use a 2001 survey of both medium-sized and large businesses to find that tax compliance costs increase with respect to firm size, with firms over $1B of assets spending on average $1.3M on their tax function. Both studies also find that compensation paid to tax personnel represents the most substantial

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[6] McGuire, Omer and Wilde (2014) find that firms treat their tax sheltering activities as part of their overall investment strategy, with investments in tax sheltering being associated with firms' investment opportunity sets, operating uncertainty, and capital market pressure.

tax-related expenditure, with 60% to 70% of all tax function spending being allocated to personnel costs.

Prior studies also find that firms obtain substantial returns from tax function investment. Mills et al. (1998) find that firms on average obtain $4 of tax savings per $1 spent on their tax function. Omer, Bedard and Falsetta (2006) show that firms obtain tax rate reductions from engaging in auditor-provided tax services, although these effects were reduced following the Sarbanes-Oxley Act of 2002. Lynch (2014) find that firms that make internal or external tax function investments, in order to remediate tax-related internal control weaknesses, exhibit greater tax avoidance in future years. Finally, Chen et al. (2020) find that firms with larger corporate tax departments exhibit greater tax avoidance and lower tax risk[7]. Overall, the literature suggests that tax function investments are a substantial input into achieving beneficial tax planning outcomes.

The Relationship between Incentives and Investments

Given the findings in prior literature that tax function investments yield substantial returns, managers who are incentivized to avoid taxes will likely make additional investments in the tax function, which should involve employing tax personnel. Practically, this can occur if the firm's current tax department lacks the knowledge and competency necessary to develop and implement additional tax strategies, such that further hiring is required. For example, a manager may wish to lower the firm's tax liability through multinational tax planning and profit shifting, but current tax employees may not have sufficient knowledge of international tax law, tax treaties or transfer pricing. Therefore, the manager may need to allocate additional resources to hire a tax director with sufficient

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[7] In untabulated analyses, I was able to successfully replicate the main results of Chen et al. (2020), confirming that larger tax departments are indeed associated with higher levels of tax avoidance.

international tax knowledge. Additionally, the firm's tax department may not have sufficient personnel to manage the additional compliance activities associated with the implementation of new tax planning strategies. Activities such as tax-related accounting and record-keeping, data collection, and tax return filing are all likely made more complex with additional tax planning activities. Firms that become more aggressive in income shifting, for example, may need additional personnel to manage transfer pricing documentation. Further, IRS scrutiny is likely to increase following an increase in tax avoidance, and tax personnel may be required to manage the audit process.

One implicit assumption made in this study is that, in the absence of specific incentives, managers may underinvest in the tax function despite the significant returns it provides to the firm. Jensen and Meckling (1976) argue that if an action is costly to the manager but provides net benefits to the firm, managers need incentives to take the action. In this context, tax function investments can be costly to a manager in several ways. First, there is a direct financial cost, since compensation paid to tax personnel and external advisors lowers the firm's pre-tax income and reduces the manager's bonus compensation. On the other hand, the returns from these investments (in the form of tax payment reductions) may not affect the manager's compensation if: i) the manager is compensated using pre-tax, rather than after-tax, income[8], or ii) the marginal tax strategies implemented are deferral strategies that do not affect the tax expense, and thus will not increase net income[9]. This latter argument is consistent with prior studies showing that managers are

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[8] Gaertner (2014) find that approximately 40% of firms in his sample compensate the CEO using pre-tax, rather than after-tax, income.

[9] This argument is also consistent with Graham, Hanlon, Shevlin and Shroff (2014), who find that public corporations are particularly concerned with whether a tax strategy leads to reporting a higher earnings per share.

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fixated on GAAP earnings at the expense of shareholder value (e.g. Graham, Harvey and Rajgopal (2005)).

Second, a risk-averse manager may view tax function investments in a similar manner to other risky investments, as returns on investment derived from tax planning may involve some degree of uncertainty (Rego and Wilson (2012)). Ex ante, managers may not be able to predict the amount of incremental tax savings that additional tax function spending yields, and may view tax avoidance as an inherently risky activity that they are hesitant to commit firm resources to[10]. If so, then managerial risk aversion models would predict that managers view tax function investments as a costly activity, requiring additional incentives. Prior literature finds evidence that compensation incentives are effective in motivating managers to pursue risky investments (e.g. Coles, Daniel and Naveen (2006), Rajgopal and Shevlin (2002)). Analogously, tax avoidance incentives may be effective in inducing managers to devote firm resources to the tax function.

Finally, effort-averse managers may find activities such as the hiring and management of tax personnel to be effort-intensive. Bertrand and Mullainathan (2003) investigate managerial preferences in the absence of appropriate governance mechanisms and find that managers prefer to live the 'quiet life' and avoid difficult decisions and costly efforts associated with investments. With respect to employment, they find that managers without proper incentives will raise wages to reduce turnover and 'buy peace' from workers. If employee management is a task that managers prefer to avoid, it follows that tax personnel hiring and associated activities such as compensation and performance

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[10] This is similar to arguments developed in prior tax literature suggesting that managers will forgo tax avoidance opportunities due to its inherent risk. However, I argue that the perceived risk involved in tax avoidance, in combination with the commitment of capital required to engage in additional tax avoidance, provides a much stronger reason for managers to forgo tax avoidance in favor of investing in less risky projects.

evaluation are costly actions for managers. Further, since many tax departments are actively involved in the overall business planning process for the firm, managers may want to forgo a large tax department in order to avoid unnecessary business interference[11]. Finally, consistent with prior literature showing that managers prefer allocating capital towards divisions that they are familiar with (e.g. Ang, Jong, and Poel (2014)), managers may inherently be reluctant to invest in the tax function given their limited knowledge of taxes[12].

Overall, there is substantial motivation supporting the argument that tax function investment is costly for managers, such that tax avoidance incentives can be effective in increasing the manager's willingness to take this costly action. Given the findings in Mills et al. (1998) and Slemrod and Venkatesh (2002) that the majority of tax-related investments are allocated to the employment of tax personnel, my main hypothesis follows:

H1: Managers will increase investments made in personnel within the tax department when provided with tax avoidance incentives.

There are several reasons, however, to expect that tax avoidance incentives may not lead to additional tax department investments. If managers, on average, do not utilize the firm's existing tax personnel efficiently in generating tax savings, then tax avoidance incentives may instead induce managers to change the structure or the incentives of the tax department to optimize returns, holding tax department size constant. Managers may, for

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[11] The 2018 KPMG Tax Department Benchmarking Survey find that 92% of all tax departments are at least somewhat involved in the overall business planning and strategy for the firm.

[12] This argument is also supported by Graham et al. (2015), who find that managers allocate capital across divisions based on NPV rankings as well as their 'gut feel'. Managers without tax avoidance incentives may have an unfavorable view of the tax function's importance within the firm, and are unlikely to perceive investments in the tax function as a positive-NPV investment, leading them to forgo these investments.

example, shift the focus of the tax department from a cost center to a profit center (Robinson, Sikes and Weaver (2010)), or change the compensation incentives of the tax director (Armstrong, Blouin and Larcker (2011)), in order to better utilize the tax department without needing to hire additional personnel. Since hiring personnel imposes a direct financial cost on the firm, and can be negatively influenced by frictions within the labor market for tax professionals, managers may prefer to pursue these other channels in order to facilitate the firm's tax planning.

Second, many tax avoidance incentives studied in prior literature are also likely to change the marginal costs and benefits of a variety of non-tax investments. Facing limited firm resources, managers make trade-offs between different types of investments. For example, increases in equity risk incentives may increase the attractiveness of a variety of risky projects. To the extent that these projects increase firm risk more so than tax avoidance, the manager may divert resources to these other areas instead, as opposed to the tax function. Other tax avoidance incentives, notably financial constraints, limit the firm resources that the manager has in her discretion. Therefore, while the manager would like to increase tax function investments in response to the incentive, there may be insufficient funds to do so.

Finally, managers may increase tax function investments without necessarily needing to invest in the tax department. They may instead engage external tax consultants, either from their auditor or a third party. Slemrod and Venkatesh (2002) find that approximately 25% of all tax function spending is allocated to external costs, and Klassen, Lisowsky and Mescall (2016) show that 45% of firms in their sample have tax returns that are prepared by external parties. This suggests that a non-trivial portion of total tax function investments is allocated to external parties. To examine the possibility that managers

respond to tax avoidance incentives by engaging tax consultants, as opposed to investing in personnel, I examine the relation between tax avoidance incentives and auditor-provided tax service fees in supplementary tests.

CHAPTER III

DATA AND RESEARCH DESIGN

Data and Sample Selection

I obtain data on corporate tax departments from the professional networking website *LinkedIn. LinkedIn* is the largest professional networking website in the world, with over 575 million members and 30 million firms worldwide registered. Employees who post their professional resumes on the website disclose information on their current and prior work experiences, including job titles, employers, and the time period employed. As discussed earlier, prior tax studies use *LinkedIn* to examine the effect of tax department size (Chen et al. (2020)), and hiring from tax avoidant firms (Barrios and Gallemore (2018)), on tax planning outcomes[13]. Using the information provided by tax employees on *LinkedIn,* I construct a firm-year panel dataset of corporate tax department characteristics.

I begin my data collection process by generating a list of US public corporations on *Compustat*, and searching each of these corporations on *LinkedIn* to identify tax employees with current or prior work experience in the firm. All figures are presented in Appendix C, and all tables are presented in Appendix D. Table 1, Panel A provides details on the sample selection procedures employed during this process. I begin with a total of 11,694 US-incorporated public corporations listed in the Compustat database after the year 2000 with non-missing total assets over $10M[14]. Next, I remove firms in the financial services

[13] In addition, several accounting studies have also employed *LinkedIn* data in a variety of settings – such as examining the consequences of having employees with prior work experience in the firm's incumbent auditor (Bird, Ho, Li and Ruchti (2017)), and examining whether revolving rating analysts who transition from rating agencies to issuers are associated with rating inflation in the issuers' securities (Jiang, Wang and Wang (2018)).

[14] I exclude extremely small firms as these firms are unlikely to have a tax department, and firms that only exist prior to the year 2000 as employee working for these firms may have retired and not have a *LinkedIn* account.

industries (SIC codes 6000-6899) following prior literature[15], and firms that are consistently missing basic financial information on Compustat. Following these restrictions, a total of 6,886 firms remain in the sample. Note that, in contrast to prior studies using *LinkedIn*, I do not restrict my data collection to S&P 1500 firms. This is important for the purposes of this study, as several tax avoidance incentives (e.g. financial constraints) may be more prevalent among smaller firms.

For each of these firms, I conduct searches on *LinkedIn* to identify tax employees who worked in the firm during each year between 2000 and 2017. I begin my sample in 2000 as *LinkedIn* entries are sparse prior to that period, and I end my sample in 2017 to mitigate the influence of the Tax Cuts and Jobs Act (TCJA) which may cause abnormal changes in tax employee hiring in response to the tax reform. I use the firm's corporate legal name, as well as variants of that name, as search inputs during this process. Following Chen et al. (2020), I identify a tax employee as a US-based employee[16] with the word 'tax' in their job title. For each employee identified, I extract information on the employee's job title(s) in the firm, their prior work experience, and their educational background. Among the 6,886 firms searched, there are a total of 3,311 firms (48%) that have at least one tax employee employed in the firm during the sample period. As expected, most firms without

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[15] In addition, since many financial services firms offer tax services to clients as well (e.g. Gallemore, Maydew and Tipper (2018)), it is difficult to distinguish (from the job title alone) a tax employee that works in the firm's internal tax function from a tax employee that works in providing external client services. Following this argument, I also exclude firms that offer tax services as part of their business model (e.g. H&R Block, ADP, Paychex)

[16] This implies that my measure of tax department size excludes tax personnel located in foreign subsidiaries. I exclude these employees for two reasons. First, the majority of tax planning related activities, such as transfer pricing, is centralized in the headquarters location for most firms (e.g. the 2018 KPMG Global Tax Department Benchmarking Survey), while regional tax employees primarily focus on compliance to foreign tax law. Therefore, foreign tax department size will likely be less sensitive to tax avoidance incentives (and more likely to be affected by other confounding factors such as geographical expansion). Second, *LinkedIn* is less prominent in foreign countries, suggesting that foreign tax department size will be measured with significant error.

tax employees are quite small. Among S&P 1500 firms, only 15% of firms do not have a tax department during the sample period.

To construct my initial sample of firm-year observations, I retain post-2000 observations from all 6,886 firms regardless of whether the firm has a tax department according to *LinkedIn*. Since my objective is to examine the effect of tax avoidance incentives on tax department investments, it is necessary to retain observations from firms that do *not* hire a tax department during the entire sample period, despite being incentivized to do so. Excluding these observations would remove firms that choose not to respond to tax avoidance incentives by constructing a tax department, thus biasing the sample in favor of confirming my hypothesis. In total, there are 65,647 firm-years across all firms in the sample, which is reduced to 46,843 observations after removing observations with missing data for control variables. Approximately half of these firm-years have at least one tax employee working in the firm. This sample size is reduced further in subsequent tests depending on the data availability of the incentive variables (when data is only available for S&P 1500 firms, the sample size is less than half of the total).

Table 1, Panel B shows the total number of tax employees present in my sample. A total of 39,876 US tax employees were employed in at least one of the 3,311 firms that have tax departments during the sample period[17]. Since my study examines how firms respond to incentives to engage in income tax avoidance, I exclude employees who, judging from their job titles, are employed solely outside of the income tax function (e.g.

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[17] A total of 56,882 US tax employees were collected during this process, which was reduced after excluding employees in firm-years outside of my final sample. Note that this is somewhat smaller than Barrios and Gallemore (2018)'s initial sample of ~65,000. Two factors contribute to this. First, I exclude financial firms (where many tax professionals work) from the analysis since many tax employees in these firms actually work on providing external tax services to clients. Second, I exclude non-US tax employees to provide a cleaner setting due to the substantial measurement error in using *LinkedIn* to identify foreign employees.

sales tax, property tax, and payroll tax employees), leaving me with a total of 31,082 income tax employees. Finally, based on the job title reported by the employee, I divide these employees into three categories (analysts, managers, and executives) based on the seniority level of each employee, with the lowest seniority level being an 'analyst', and the highest being an 'executive'[18]. Table 1, Panel B shows, as expected, that the number of employees is decreasing in seniority level, with more managers than executives, and more analysts than managers.

Data Validation

Since *LinkedIn* membership is voluntary, there may be a significant sample selection bias concern since not all tax employees will post their information on the website, introducing a potential downward bias with respect to tax department size. In order to validate my dataset, I compare my sample data to a tax department survey conducted by the Tax Executives Institute (TEI). The TEI surveyed approximately 500 chief tax officers internationally during 2011-2012 and report that, on average, there are 10.6 tax employees employed in a corporation. Among respondents, approximately 70% of firms have assets over $1B. To facilitate a comparison, I restrict my dataset to firms with a tax department in 2011 and 2012. Further, since only 60% of firms in my sample have over $1B in assets, I exclude the smallest 10% of firms. After constructing a comparative sample, I find an average of 9.73 tax employees per firm. Therefore, while there appears to be a slight downward bias in tax department size (as expected) due to *LinkedIn* coverage not being

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[18] For example, job titles containing the words 'analyst', 'accountant', 'specialist' and 'associate' are designated as analyst-level employees, job titles containing the words 'supervisor', 'manager', and 'attorney' are designated as manager-level employees, and job titles containing the words 'president', 'director' and 'counsel' are designated as executive-level employees. These classifications are consistent with Chen et al. (2020). I validate these classifications by examining unusual cases of promotions and demotions, and re-classify employees' seniority levels as appropriate. Employees are classified into one of these 3 categories based on the seniority level of the employee when they first joined the firm.

completely comprehensive, the discrepancy appears to be minor. The TEI survey also finds that 18% (9%) of respondents have 10-25 (over 25) tax employees. In my comparative sample, the statistics are very similar, with 18.8% (7.4%) of sample firms in the respective categories. Overall, these comparisons suggest that *LinkedIn* coverage for tax employees appears to be fairly comprehensive, with only minor deviations.

One additional concern is that, since the sample period begins in the year 2000[19], there may be additional selection bias as tax employees in the earlier years of my sample may have left the workforce and thus will not have a *LinkedIn* account. While my research design attempts to mitigate these concerns through year fixed effects, I also compare my sample to a 2001 corporate taxpayer survey conducted by Slemrod and Venkatesh (2002) to assess the magnitude of this potential bias. Slemrod and Venkatesh (2002) survey a sample of corporate taxpayers drawn from corporations under the purview of the Large and Mid-Size Business (LMSB) Division of the IRS. Among firms with over $1B of assets, they find, on average, that firms spend approximately $1.33M on tax compliance costs and 60% of these costs (approx. $800,000) are attributed to internal personnel costs. Assuming an average of $80,000 per employee[20], this represents approximately 10 tax department employees per firm. Comparing this to my sample of tax department firms with over $1B in assets in 2001, I find an average of 8.77 tax employees. While the discrepancy is larger than the 2011 comparison, as expected, it does not appear to be extreme. Nevertheless, to

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[19] Since my research design incorporates firm fixed effects to exploit within-firm variation in internal tax function spending, it is necessary to have a sufficient number of years per firm. Further, certain tax avoidance incentives (e.g. hedge fund interventions) are more prevalent in the early/mid 2000s relative to more recent periods (e.g. Khurana, Li and Wang (2017)). For these reasons, I do not restrict my sample to only the most recent period.

[20] The average 2018 salary for a tax manager is $120,000, according to salary.com, which represents approximately $80,000 in inflation-adjusted 2001 dollars.

the extent that sample selection may bias the results, the results in this study should be interpreted with caution[21].

Selection of Tax Avoidance Incentives

I survey the tax literature for studies that examine specific incentives for managers to engage in corporate tax avoidance. My objective is to select a variety of different incentives studied in prior literature that motivate managers to focus on the firm's tax function, thereby potentially leading to an increase in tax department investment. I focus on published studies which conclude that a specific incentive increases the firm's level of tax avoidance, including studies where the emphasis is on more aggressive forms of tax avoidance (e.g. tax sheltering).

I use two criteria when selecting tax avoidance incentives from prior studies. First, I require the incentives data to be publicly available and feasible to collect for a large panel dataset of firm-years, which excludes several studies that employ survey methodologies (e.g. Graham, Hanlon, Shevlin and Shroff (2014)) and studies that focus on small samples (e.g. Gartner (2014)). Second, I require the tax avoidance incentive variable to exhibit significant within-firm variation, as my research methodology focuses on how managers respond to within-firm changes in incentives[22]. Following these criteria, I select four tax avoidance incentives from four different studies. I briefly discuss each of these studies

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[21] One additional concern is that some firms without tax employees listed on *LinkedIn* actually have a tax department that do not use the website. To address this, I generate a list of the 30 largest firms in my sample without tax employees on *LinkedIn*, and conduct online searches to gauge whether they have a tax department through: i) job postings for tax employees, or ii) salary reports from tax employees on the website *Glassdoor*. With one exception, I find no evidence that these firms have tax departments, mitigating this concern.

[22] For example, Higgins, Omer and Phillips (2015) find a relation between a firm's business strategy and its tax aggressiveness, arguing that 'prospector' firms have greater willingness to undertake the risk and uncertainty associated with tax avoidance. A firm's business strategy, however, is unlikely to change significantly over time, and thus it is not a suitable candidate for this study.

below, and describe the data and variables used for each of the tax avoidance incentives. Detailed variable definitions are provided in appendix A.

Financial Constraints

Edwards, Schwab and Shevlin (2016) and Law and Mills (2015) both hypothesize that managers of firms that become financially constrained – i.e. firms that experience increases in their external financing costs or decreases in their ability to access funding, will increase tax planning activities in order to obtain additional internal funds. Consistent with expectations, both studies find that firms experiencing increases in financial constraints exhibit significant declines in cash effective tax rates (Cash ETR)[23]. To measure financial constraints, I follow Edwards et al. (2016) and use the Altman (1968) Z-score, the Kaplan and Zingales (1998) KZ Index, and the Whited and Wu (2006) WW Index[24]. The KZ index and WW index are measures intended to capture firms that experience investment-related financial constraints, while the Z-score is designed to capture firms in financial distress. All measures are computed using financial statement variables available on Compustat. I also follow Law and Mills (2015) and measure financial constraints using the percentage of words in the firm's 10-K that carry a negative tone[25]. Finally, I combine the four constraint measures together into one combined index using Principal Components Analysis (PCA), extracting the first component.

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[23] Law and Mills (2015) also find that financially constrained firms report higher UTB reserves and increase tax haven usage.

[24] Note that Edwards et al. (2016) did not tabulate results for the WW index, but used it as a robustness test.

[25] Examples of 'negative words' include: loss, limited, adverse, impaired, and against. I thank Bill McDonald for providing this data on his website.

CEO/CFO Equity Risk Incentives

Rego and Wilson (2012) argue that, when provided with equity risk incentives (i.e. executive stock options), risk-averse managers are incentivized to make more risky decisions in order to maximize their personal wealth. Since the pursuit of aggressive tax positions is considered a risky activity for the firm, due to the likelihood of being challenged by tax authorities as well as potential reputational costs, the authors predict that equity risk incentives will lead to an increase in firms' tax aggressiveness. They find a significant relationship between both CEO and CFO equity risk incentives and various empirical proxies for tax aggressiveness. Following Rego and Wilson (2012), I employ a measure of equity risk incentives developed in Guay (1999) and Core and Guay (2002) – the 'portfolio vega' of the CEO and CFO. This measure computes the sensitivity of the CEO's stock option portfolio value to a 1% increase in the firm's stock return volatility, using the Black-Scholes options pricing model. The inputs to this calculation are available in the Execucomp database[26].

Hedge Fund Activism

Cheng, Huang, Li and Stanfield (2012) examine the relationship between hedge fund activism and corporate tax avoidance. They hypothesize that effort-averse managers prefer to limit the effort and risk associated with tax planning, and that hedge fund activists can, through informed monitoring, incentivize managers to employ tax avoidance strategies that enhance firm value. They find evidence that firms exhibit greater levels of tax avoidance following an intervention event by a hedge fund activist. To identify hedge

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[26] I thank Lalitha Naveen for providing the data and computation methodology for the CEO and CFO portfolio delta and vega used in Coles, Daniel and Naveen (2006) on her website. Note that the data she provides only extends to 2014.

fund activism events in my sample, I begin with the Schedule 13D filings database constructed by AuditAnalytics[27]. Next, I use the Bloomberg database, as well as internet searches, to identify whether each 13D filer is a hedge fund[28], and use the results to determine whether each firm in my sample has been targeted by a hedge fund, as well as the first year that the hedge fund intervention began. To make the data collection process more manageable, and to allow control variables to be included for executive compensation[29], I focus only on hedge fund interventions for S&P 1500 firms in this analysis. Finally, I separate observations for each hedge fund target firm into a pre and post period (split on the first year the firm is targeted by a hedge fund activist) and compare tax department investments between the two periods, relative to untreated firms, in a difference-in-differences design.

Analyst Cash Flow Forecasts

Finally, Ayers, Call and Schwab (2018) examine changes in firms' tax planning behavior after analysts begin issuing cash flow forecasts for the firm. They predict that, due to the substantial cash tax savings yielded from tax avoidance, managers of cash flow forecast firms will be incentivized to increase tax avoidance activities in order to improve the firm's cash flow health and meet these forecasts. They find substantial reductions in firms' cash tax payments after the initiation of cash flow forecasts. Following this study, I

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[27] When an investor acquires a 5% or greater stake in a public corporation, they are required to file a Schedule 13D form with the SEC within 10 days and declare their intentions to influence the firm and its managers.

[28] Following Khurana et al. (2018), I only conduct searches on frequent Schedule 13D filers – i.e. activists that have launched a minimum of three activism campaigns during my sample period.

[29] Since the intentions of hedge fund activists involve influencing management through channels such as compensation incentives (e.g. Brav, Jiang and Kim (2010)), it is likely necessary to control for elements of executive compensation (i.e. CEO Delta and Vega) in related analyses, which is only available for S&P 1500 firms in Execucomp.

utilize the I/B/E/S detail file database to identify firms with cash flow forecasts issued for them, as well as the first year in which analysts began issuing these forecasts for each firm. I separate observations for each cash flow forecast firm into a 'pre-forecast' and a 'post-forecast' period to analyze the difference in tax department investments, relative to untreated firms, between the two periods in a difference-in-differences design[30].

Research Design

The primary objective of my study is to examine the relationship between investments in corporate tax departments and the aforementioned tax avoidance incentives. Since the quantity of tax personnel is the most direct proxy in examining tax department investments, I construct my dependent variable using the number of income tax function employees working in the firm during the year. Next, I scale this variable by the total number of employees in the firm (in thousands), so that the resulting measure, *TAXDEPT_SIZE*, represents the proportion of total employees of a firm who are employed within the income tax function of the firm's tax department. I use the number of employees as the denominator of choice for three reasons. First, it is consistent with prior literature examining tax department investments (i.e. Chen et al. (2020), Ege et al. (2020)). Second, it allows both the numerator and denominator to be represented in the same unit of measurement (i.e. number of people), preventing measurement issues that may arise if scaling by dollars (such as inflation).

Using *TAXDEPT_SIZE* as the dependent variable, I estimate the following regression model using ordinary least squares (OLS):

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[30] Since the focus of this analysis is on cash flow forecast firms that were treated during the sample period, I remove firms from the sample that have already received an analyst cash flow forecast prior to the year 2000.

$$TAXDEPT\_SIZE_{i,t} = \beta_0 + \beta_1 INCENTIVE_{i,t} + \beta_2 SIZE + \beta_3 LN\_SEGMENTS +$$

$$\beta_4 ROA + \beta_5 BTM + \beta_6 FIRM\_AGE + \beta_7 LEVERAGE + \beta_8 PPE + \beta_9 R\&D +$$

$$\beta_{10} INTANG + \beta_{11} INVENTORY + \beta_{12} SG\&A + \beta_{13} NOL + \beta_{14} CHANGE\_NOL +$$

$$\beta_{15} FOR\_DUMMY + \beta_{16} FOR\_INCOME + \beta_{17} LN\_HAVENS +$$

$$\beta_{18} TAXFEES\_DUMMY + \beta_{19} LN\_EMPLOYEES + FIRM\ AND\ YEAR\ FE + \epsilon_{i,t}$$

(1)

In this regression, I predict that $\beta_1 > 0$ – that managers, when given greater tax avoidance incentives, will increase investments made in the tax department. *INCENTIVE* is one of the four types of variables used to capture a specific tax avoidance incentive. For financial constraints and CEO/CFO equity risk incentives, *INCENTIVE* is measured using a financial constraint index, and the portfolio vega of the CEO or CFO, respectively. With respect to hedge fund activism (analyst cash flow forecasts), *INCENTIVE* is replaced with an indicator variable equal to one for all firm-years after the firm is first targeted by a hedge fund (receives its first cash flow forecast), and zero for all firm-years prior to the respective treatment event. For firms that have never received the treatment, *INCENTIVE* is zero for all firm-years. With the addition of firm and year fixed effects, the model effectively represents a difference-in-differences research design, where the coefficient of interest represents the average change in tax department investments between the pre- and post-treatment periods for firms after receiving the respective treatment in year *t*, relative to firms that did not receive the treatment in year *t* (e.g. Bertrand and Mullainathan (2003), Armstrong, Balakrishnan and Cohen (2012)).

Note that, by incorporating firm fixed effects into the model, the analysis only exploits *within-firm* variation in both tax department investments and incentives, thereby focusing on how tax function investments respond to a within-firm change in incentives.

Year fixed effects are also included to control for time trends in tax department size, as well as mitigate potential biases with respect to changes in *LinkedIn* coverage over time. In addition, since the number of tax personnel employed by a firm is a function of characteristics not necessarily driven by tax avoidance incentives, such as the complexity of tax reporting and the volume of tax-related transactions, it is important to control for a number of firm characteristics that are potential determinants of corporate tax department size. Therefore, I include a variety of control variables, the majority of which are used in Chen et al. (2020).

Specifically, I include firm size (the logarithm of assets), the number of business segments, the pre-tax return on assets, the book-to-market ratio, and firm age to account for differences in the tax departments of larger, more mature, more profitable, or higher growth firms. I also include leverage, property plant & equipment, research & development expenditures, intangible assets, inventory, and SG&A expenses as these characteristics are commonly associated with a firm's tax planning opportunities and are thus likely related to the number of tax personnel needed to meet tax planning objectives. I control for the firm's tax status (the existence of, and change in, net operating loss carryforwards (NOLs)) to account for possible differences in tax activities between firms with and without NOLs. I include variables capturing the scope of a firm's foreign operations (an indicator variable for foreign activity, the amount of foreign income, and the number of tax haven subsidiaries), as multinational firms may have larger tax departments. I also include a variable capturing the amount of tax fees paid to the firm's auditor, as tax function outsourcing may either substitute for, or complement, investments in tax department personnel. Finally, I add a control variable for the number of employees within the firm,

as the relationship between tax department size and total employees is unlikely to be proportional[31].

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[31] Untabulated analyses confirm a non-linear relationship between tax department size and total employees.

CHAPTER IV

RESULTS

Tax Department Characteristics

Table 2 Panels A to C presents descriptive statistics regarding the distribution of tax department size across my sample of US public corporations. On average, firms in my sample have 8 US-based tax department employees, which is reduced to 6.4 employees after removing individuals who work outside of the income tax function according to their job titles. As expected, S&P 1500 firms have larger tax departments on average (10.3 and 8.25 employees, respectively). Panel B shows that larger firms also have larger tax departments, with firms in the highest size quartile having disproportionately large tax departments (20 US employees on average). This suggests that the right-skewedness of the tax department size distribution is driven by large firms in the sample. Tax department size also appears to be evenly distributed across industries (with the exception of the telephone/TV industry, which is driven by a few large firms such as Verizon and AT&T). Panel C lists the firms that have the largest corporate tax departments in my sample as of 2016, which includes firms known for having large tax departments such as General Electric[32] and Amazon.

In Panels D and E, I also provide some information on individual characteristics of tax employees within my sample, separated by seniority rank of the employee. As expected, the experience accumulated by tax employees prior to hiring is increasing in seniority rank, and the majority of tax employees' prior experience is accumulated in Big-

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[32] Note that, in 2017, General Electric made an agreement with PwC to transfer the large majority of its tax employees over to the accounting firm. This included the move of 275 US-based tax employees, which is fairly close to the number of US tax employees in GE registered on LinkedIn (287). See https://www.journalofaccountancy.com/news/2017/jan/pwc-to-add-ge-tax-team-201715836.html

N accounting firms and corporate tax departments, particularly among tax managers and executives. The educational level attained by an employee is also increasing in seniority rank, with the majority of tax executives having either a MTax or a law degree. Panel E shows that the most common prior employers of tax employees are all large Accounting firms, and that the most common universities attended by tax employees offer well-known Master's in Taxation programs[33]. Finally, Figure 1 displays the most frequent skills that tax employees possess, as self-reported on their *LinkedIn* profiles, which includes a variety of tax-specific skills including corporate tax, international tax, and tax accounting.

Descriptive Statistics – Regression Variables

Table 3 presents descriptive statistics of the variables used in the regression model to test my main hypothesis. The dependent variable (*TAXDEPT_SIZE*) represents the total number of income tax function employees in the firm, scaled by total employees (in thousands). The mean value of *TAXDEPT_SIZE* is 0.658 suggesting that, on average, 0.066% of all employees in a firm work in the income tax function. When excluding firm-years without tax departments, this increases to 0.128% (i.e. approximately 1 in 780 employees).

With respect to the tax avoidance incentive variables, the descriptive statistics for the four financial constraints indices and the two equity risk incentive measures are fairly similar to prior studies (e.g. Edwards et al. (2016), Law and Mills (2015), Rego and Wilson (2012)). For the other two incentives, I find that over 50% of firms have received analyst cash flow forecasts during the sample period, consistent with prior literature showing that

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[33] The top two universities attended (Golden Gate University and DePaul University) are both ranked the highest among all MS Tax programs in the United States, according to a survey of corporate tax department heads conducted by taxtalent.com. See: https://www.taxtalent.com/mstsurvey/2013_MS_Tax_Report.pdf

cash flow forecasts are commonplace in recent years[34] (e.g. Mohanram (2014)). On the

other hand, only about 19% of firms have been targeted by a hedge fund in my sample,

consistent with the number of hedge fund activism events documented in prior studies (e.g.

Khurana et al. (2018)) relative to the total number of firms. Note that the sample sizes

differ substantially between the incentive measures, as the equity risk incentives and hedge

fund activism data collection is restricted to S&P 1500 firms.

Main Results

Table 4 presents the results of estimating regression model (1), which investigates

the relationship between *TAXDEPT_SIZE* and *INCENTIVE*. Columns (1) to (5) of Panel A

present the results of the regression using financial constraints as the measure of tax

avoidance incentives. I standardize each financial constraints index to have a mean of 0

and a standard deviation of 1 for ease of interpretation. With all four constraint measures,

as well as the combined index, I find a significantly positive relationship between financial

constraints and tax department size, suggesting that managers make greater investments in

the tax department when their firms are financially constrained[35]. Using the combined

index, a one-standard deviation in financial constraints is associated with a 0.044 unit

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[34] Since the cash flow forecast analysis excludes firms that were already treated prior to the sample period (i.e. firms that have already received a cash flow forecast before the year 2000), the actual percentage of treated firms is substantially higher.

[35] These results may be seen as counterintuitive, as it is uncertain how financially constrained firms would be able to generate resources to hire additional tax personnel. I argue that, to the extent that managers expect returns from tax department investments to be realized quickly (since tax benefits may be realized as soon as the next tax year), they may divert resources from other divisions to the tax department when financially constrained in order to quickly generate cash. This argument is consistent with Graham et al. (2015), who find that managers of financially constrained firms heavily consider cash flow timing when making capital allocation decisions.

increase in *TAXDEPT_SIZE*, representing a 6.7% increase in tax department investments for the average firm[36].

Columns (5) and (6) uses the equity risk incentives of the CEO and CFO, respectively, as the measure of tax avoidance incentives. Both variables are standardized. In addition to the control variables in model (1), I also control for the pay-for-performance sensitivity[37] (i.e. the 'delta') and the age of the executive similar to Rego and Wilson (2012). With both the CEO and CFO, I find a significantly positive relationship between their portfolio vega (the sensitivity of their portfolio wealth to firm risk) and tax department size, indicating that managers increase tax department investments when given risk-taking incentives through equity compensation. A one-standard deviation increase in the CEO's (CFO's) equity risk incentives is associated with a 5.8% (5.9%) increase in tax department investments for the average firm.

Panel B investigates the change in tax department investments following a hedge fund intervention or an analyst cash flow forecast, using a difference-in-differences design with untreated firms (i.e. firms not experiencing the event) as the control group. Columns 1 and 2 replaces *INCENTIVE* with *Post Hedge Fund* and *Post Cash Flow Forecast* respectively, which equals to 1 for all firm-years after a firm receives the respective treatment. Column 1 shows a significantly positive relationship between tax department size and *Post Hedge Fund*, suggesting that managers increase tax department investments after being targeted by a hedge fund. The average firm experiences an increase in tax

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[36] The mean value of *TAXDEPT_SIZE* is 0.658, so a 0.044 unit increase corresponds to a 6.7% increase.

[37] While I do not make a formal prediction, it is noteworthy that the coefficients on both *CEO DELTA* and *CFO DELTA* are significantly negative, suggesting that managers make less investments in the tax department when their portfolio is more sensitive to the firm's stock price. This is consistent with Desai and Dharmapala (2006), who find a negative relation between incentive compensation and tax sheltering.

department investments of 14.6% after the hedge fund intervention, relative to firms that do not receive the intervention in the same period. Column 2 also shows a significantly positive relationship between tax department size and *Post Cash Flow Forecast*, indicating that managers also increase tax department investments after analysts issue the first cash flow forecast for the firm. Relative to untreated firms, the average firm increases tax department investments by 21% following the first cash flow forecast that was issued. For additional control variables, I include the CEO's vega and delta in the hedge funds analysis, as prior studies show that hedge funds can influence CEO compensation (e.g. Brav, Jiang and Kim (2010)). I control for the number of analysts following the firm in the cash flow forecast analysis, as the issuance of cash flow forecasts may be accompanied by increased analyst following, which can influence tax department investments.

One concern with the above specification is that, since I use all firms that were not subject to the treatment as the control group, the results may be biased if there are fundamental differences between the two groups (for example, firms with analyst cash flow forecasts are significantly larger and more profitable). To account for this, I employ entropy balancing (Hainmueller (2012)) to weigh observations in the control group in order to achieve covariate balance with respect to the main control variables[38]. Observations are weighted to achieve balance in the first, second and third moments of the distribution with respect to each variable. Intuitively, this creates a control group that is identical to the treatment group, in terms of the distribution of observable firm characteristics, with the exception that they were not subject to the specific treatment. Columns (3) and (4) repeats

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[38] These control variables also include year fixed effects and industry fixed effects, such that the treatment and control groups are also identical with respect to both industry composition and time period.

the analyses using the entropy-balanced sample. Results are qualitatively similar, with a reduction in the magnitude of the treatment effect for analyst cash flow forecasts.

Overall, these results provide support for Hypothesis 1 – that managers respond to tax avoidance incentives by increasing investments in the firm's tax department. Each of the four types of incentives are significantly and positively associated with tax department investments, after controlling for many other determinants of tax department size and focusing only on within-firm variation through firm fixed effects. These results suggest that tax avoidance incentives induce managers to focus on the tax function and allocate resources towards employing tax personnel.

In Appendix B, I provide evidence that the tax department effects documented above are mostly concentrated among firms who successfully avoid cash taxes in response to each incentive. Specifically, after dividing firms into two subsamples based on whether the firm's Cash ETR declines with increases in each incentive, I find that my results are consistently stronger in the subsample of firms who exhibit Cash ETR declines. This suggests that, on average, the firms who increase tax department investments following an incentive are the same firms who ultimately achieve tax savings. Overall, these results provide some assurance that the tax department effects documented in this study are indeed reflective of tax avoidance behavior. Please see the Appendix for more details.

Tax Employee Heterogeneity

While the neo-classical view of the firm suggests that employees are merely homogenous inputs into the firm's production process, many economics studies have rejected this view in favor of the theory that employees are heterogeneous and can play a role in determining firm productivity (e.g. Black and Lynch (1996), Haltiwanger, Lane and

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Speltzer (1999)). In this context, employees hired within the tax department accumulate different types of work experience and educational backgrounds (see Table 2, Panel D), and prior tax studies (Barrios and Gallemore (2018)) suggest that employers of tax personnel do consider prior work experience in making hiring decisions. Therefore, the types of tax employees that managers employ when provided with tax avoidance incentives may vary as well.

First, I examine whether the increases in tax department investments are concentrated among junior or senior tax employees. While junior tax employees (e.g. analysts and accountants), due to having relatively few tax planning skills, mainly focus on compliance roles such as tax return preparation, data analysis or tax audit assistance, senior tax employees (e.g. managers and directors) may play an active role in the firm's tax planning given a more developed skillset[39]. Therefore, managers may respond to tax avoidance incentives by allocating resources towards hiring senior tax employees specifically. I examine this possibility by partitioning *TAXDEPT_SIZE* by seniority and estimating two separate regressions for each tax avoidance incentive, replacing the dependent variable with the number of junior (senior) tax employees in the first (second) regression. I standardize the dependent variables to facilitate a comparison between the coefficients of the two regressions. Table 5, Panel A presents the results, which provides support for this prediction. With the exception of analyst cash flow forecasts, the relationship between tax avoidance incentives and tax department investments is only significant when considering the amount of senior tax employees employed within the firm,

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[39] A search of job descriptions of several job postings for junior and senior tax positions confirms that senior tax employees are mainly responsible for tax planning activities, as well as the consequences of these activities such as managing IRS tax audits and leading FIN 48 reserve evaluations.

lending support to the theory that managers will hire employees with tax planning responsibilities when provided with tax avoidance incentives.

Within senior tax employees, there is substantial heterogeneity with respect to both work experience and education, and managers may respond to tax avoidance incentives by hiring employees that are best suited to support tax planning activities given their backgrounds. I first examine whether managers have preferences with respect to employees' work experience. Employees who have previously worked in a tax department may be more familiar with corporate tax planning relative to employees with public accounting experience. This is consistent with prior literature which find that external auditors are less aggressive in tax planning than corporate tax departments (Klassen et al. (2015)), and that employers prefer hiring directly from a public corporation relative to an accounting firm when experiencing deteriorating tax performance (Barrios and Gallemore (2018)). Therefore, managers with tax avoidance incentives may prefer hiring employees with prior tax department experience. To test this, I estimate two regressions for each incentive, using the standardized number of senior tax employees with prior public accounting firm experience (tax department experience) as the dependent variable in the first (second) regression. I find some support for this prediction in Table 5, Panel B. With the exception of analyst cash flow forecasts, tax avoidance incentives are only significantly associated with tax department investments for employees with prior tax department experience.

Finally, I examine whether managers have preferences with respect to employee education. Specifically, employees with relevant graduate degrees (e.g. an MTax or a Law degree) may have developed technical knowledge in corporate tax law through their education, and are able to signal technical competence with respect to tax planning in the

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labor market. Therefore, managers with tax avoidance incentives may hire employees who have attained these graduate degrees. I examine this possibility by partitioning *TAXDEPT_SIZE* based on educational background and estimating two regressions for each incentive using the number of employees with and without relevant graduate degrees (standardized). Table 5, Panel C presents the results of these regressions, which provide limited support for this prediction. With respect to financial constraints and equity risk incentives, the relationship between tax department investments and tax avoidance incentives is larger among employees with graduate degrees. However, the opposite is true with hedge fund interventions and analyst cash flow forecasts, contrary to my prediction.

Figure 2 presents several graphs comparing the coefficients estimated from these regressions. These graphs show that, across all incentives, the effects of tax avoidance incentives on tax department investments are stronger among senior tax employees as well as employees with tax department experience. However, with respect to employees' educational backgrounds, the evidence is more mixed. Overall, there is some support for the theory that managers with tax avoidance incentives are more likely to invest in tax employees with specific characteristics that facilitate tax planning.

Incentive Increases and Tax Department Hiring

In my main analysis, I examine how the total number of tax personnel working in a firm is affected by each of the four tax avoidance incentives. One alternative research design, however, is to examine whether *increases* in tax personnel (as opposed to the *level* of personnel) is related to *increases* in incentives. Specifically, when the firm experiences a large increase in tax avoidance incentives during a certain year, is the manager more likely to hire a tax employee in that same year? This research design has

two benefits relative to my main analysis[40]. First, it isolates the timing of managerial response to each incentive to the year in which the incentive increases, which improves identification. This is particularly important for the hedge fund and cash flow forecast analysis, since the conclusion in my main analyses is that managers make larger tax department investments in the years following the treatment. However, it is unclear whether this effect takes place immediately after the treatment or in several years after treatment begins (the latter of which may not be actually caused by the treatment itself). Second, the dependent variable represents an actual action that managers take when incentives increase (i.e. the hiring of a tax employee), which may be a more intuitive research design relative to examining the total number of tax employees in the firm.

To test the prediction that increases in tax avoidance incentives will trigger immediate tax department hiring, I estimate the following regression using a conditional fixed effects logit model:

$$HIRED\_SENIOR_{i,t} = \beta_0 + \beta_1 INCENTIVE\_SHOCK_{i,t} + \beta\ CONTROLS_{i,t} +$$
$$FIRM\ AND\ YEAR\ FE + \epsilon_{i,t}$$

where *HIRED_SENIOR* is an indicator variable equal to one if the firm hired a senior tax employee (manager or executive) in the year. I focus on senior employees given my prior findings that tax department investments are concentrated among tax employees with higher seniority. *INCENTIVE_SHOCK* is an indicator variable equal to one if the firm experienced a large increase in tax avoidance incentives in year *t*. For hedge funds and cash flow forecasts, *INCENTIVE_SHOCK* is equal to one in the year the firm is first targeted

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[40] There are also some drawbacks to this research design. First, employee hiring may be accompanied by employee departures, such that the total investment in the tax department is unchanged. Second, it only exploits *increases* in the tax avoidance incentive. To the extent that decreases in tax avoidance incentives may reduce tax department investments, the research design will not adequately capture this effect.

by a hedge fund, or received its first cash flow forecast. This is likely the year in which the firm experiences the most significant change in tax avoidance incentives, and the year in which managers may be most likely to respond. For financial constraints and equity risk incentives, I set *INCENTIVE_SHOCK* equal to 1 if the firm experienced a change in the respective incentive greater than 75% of all firms in the same year.

I estimate the above regression for each tax avoidance incentive variable, and present the results in Table 6. Note that, for this analysis, firms without tax departments (as well as firms that hire every year) are excluded since fixed effect logit models require variation in the dependent variable within each group. Panel A shows that, in the year that firms experience a large increase in financial constraints, the probability of hiring a tax employee significantly increases. The results hold with all four financial constraints indices as well as the combined index. Depending on the measure used, managers are 6% to 18% more likely to hire a senior tax employee during a year with increasing financial constraints, relative to baseline years[41]. I find similar results with equity risk incentives, as managers are 7.6% (9.6%) more likely to hire a senior tax employee when the CEO (CFO) vega increases. In Panel B, I also find evidence of a significant increase in the probability of tax employee hiring in the year the firm is targeted by an activist hedge fund, and in the year that the firm receives its first analyst cash flow forecast. A manager is 30% (20%) more likely to hire a senior tax employee in the year the firm receives the treatment with respect to hedge funds (cash flow forecasts), relative to baseline years. Overall, I find strong evidence that increases in tax avoidance incentives can trigger immediate tax department hiring.

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[41] With the KZ-index, for example, hiring odds are computed as (e^0.165) for firms experiencing a shock in financial constraints.

Finally, I examine how tax department hiring changes in the years prior to, and in the years subsequent to, each incentive shock. Unless managers can anticipate future economic conditions or forecast stakeholder behavior, I do not expect tax department hiring to increase in the years prior to the incentive shock. However, managers may respond to tax avoidance incentives with a delay, and thus it is possible that tax department hiring also increases in the years following each shock. To test this, I re-estimate the logistic regressions in Table 6, but replace *INCENTIVE_SHOCK* with an indicator variable representing an adjacent year. I summarize the coefficients from these regressions in several line graphs depicted in Figure 3, where each graph represents the results for a specific tax avoidance incentive.

Overall, these graphs show little evidence that managers increase hiring in any of the adjacent years surrounding the four incentive shocks. Each of the four graphs show that the probability of tax department hiring exhibits a large spike in the year of the incentive shock and does not exhibit similar spikes in any of the surrounding years, with one exception for the CEO equity risk incentive in year *t-1*. These results suggest that the effect of incentive shocks in triggering tax department hiring is concentrated in the year of the shock. It also provides some assurance that the tax department hiring is actually triggered by the incentive itself, rather than other changes in firm conditions associated with the incentive.

CHAPTER V

SUPPLEMENTARY ANALYSES

In this chapter, I explore several other actions that managers may take in response to tax avoidance incentives. First, I explore whether managers increase the amount of services demanded from external tax service providers. Next, I examine whether managers invest in tax lobbying activities to achieve favourable tax legislation.

Tax Function Outsourcing

While the majority of tax function investments are allocated to internal tax personnel (e.g. Mills et al. (1998)), firms also regularly engage in external tax consultants for tax planning activities. Slemrod and Venkatesh (2002) find that approximately 25% of all tax function spending is allocated to external costs. Notably, the firm's auditor is one type of external advisor that many firms utilize for their tax function, also known as 'auditor-provided tax services' (APTS). Klassen et al. (2016) find that 20% of firms in their sample file tax returns which are prepared externally by the firm's auditor. They further find that APTS fees are positively related to tax avoidance. Therefore, managers incentivized to increase tax avoidance activities may choose to allocate additional resources to the firm's APTS. This may be particularly true for firms that do not have tax departments, as the entirety of their tax function is outsourced and the costs of starting a tax department may be prohibitively high.

To test this prediction, I investigate the relationship between the four types of tax avoidance incentives and the APTS fees paid by the firm (obtained from AuditAnalytics). I re-estimate my main regressions in Table 4, and replace *TAXDEPT_SIZE* with *TAX_FEES*, representing the natural logarithm of tax fees paid to the firm's auditor. I

estimate the regressions on subsamples of firms with and without tax departments during the sample period, as I predict that the effect of incentives on APTS fees is stronger among firms that do not have a tax department. I also control for the total fees paid to the auditor (including audit fees), as well as the firm's tax department investments (*TAXDEPT_SIZE*). Table 7 presents the results.

Overall, there is some limited evidence that APTS fees increase when managers are provided with tax avoidance incentives, but only for firms that do not have tax departments[42]. In Panel A, I find some evidence, among firms without tax departments, that firms pay significantly higher APTS fees when they are either financially constrained or targeted by a hedge fund activist. In Panel B however, I find no evidence of an increase in APTS fees for any of the incentives among firms that do have tax departments, suggesting that tax avoidance incentives only have an effect on tax function outsourcing when firms outsource all of their tax-related activities[43].

Corporate Tax Lobbying

Prior research suggests that firms spend resources on tax lobbying expenditures in order to influence corporate tax policy in a favourable manner. Meade and Li (2015) argue that tax lobbying occurs when firms either want to preserve an existing tax benefit ('defensive lobbying') or to obtain new benefits ('strategic lobbying'). They also find that firms in the latter group achieve lower ETRs after engaging in tax lobbying. Several other

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[42] Note that the sample size for the non-tax department sample is very small in the equity risk incentive and hedge fund regressions due to the sample being restricted to S&P 1500 firms, as the large majority of these firms have a tax department during the sample period.

[43] Interestingly, firms with tax departments appear to invest *less* resources in APTS after being financially constrained. Combined with the results in table 4, this suggests that firms might substitute tax personnel investments for APTS fees when financially constrained. This may explain how financially constrained firms obtain resources to invest in the tax department despite a lack of internal funds.

studies have also concluded that tax lobbying firms obtain positive tax outcomes relative to non-lobbying firms (e.g. Hill, Kubick, Lockhart, Wan (2013), Brown, Drake and Wellman (2015), Kim and Zhang (2016)). Therefore, managers may engage in tax lobbying as an avenue to manage corporate taxes in response to tax avoidance incentives. This may be particularly likely for firms that have already optimized their tax planning activities given existing tax legislation, such that the only avenue to further reduce taxes would be to influence the tax legislation itself.

To test my prediction, I first collect tax lobbying data from the public database maintained by the Centre for Responsive Politics[44]. For each firm-year in my sample, I use the database to determine whether the firm incurred any lobbying expenditures relating to tax issues specifically. Next, I re-estimate my main regressions in Table 4, but replace the dependent variable with *LOBBY(0/1)*, an indicator variable equal to 1 if the firm engaged in tax lobbying during the year. This creates a linear probability model where I examine whether each incentive significantly increases the probability of tax lobbying. Since tax lobbying is relatively sticky over time (i.e. tax lobbying firms tend to incur lobbying expenditures every year), I replace firm fixed effects with industry fixed effects (using the Fama French 48 classification system) to capture the variation in tax lobbying across firms[45]. Table 8 presents the results.

Overall, I find some evidence that tax avoidance incentives increase the probability that a firm will engage in tax lobbying. I find a significant and positive association between tax lobbying and equity risk incentives for both the CEO and CFO, with the probability

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[44] The data can be obtained in https://www.opensecrets.org/federal-lobbying.

[45] For hedge fund interventions and analyst cash flow forecasts, I also include a treatment firm indicator (as a substitute for firm fixed effects) to adopt a generalized difference-in-differences model.

increasing by 3.2% (4.0%) for a one standard deviation increase in the CEO (CFO) vega. I also find that firms are significantly more likely (by 1.5%) to engage in tax lobbying after receiving an analyst cash flow forecast, relative to untreated firms. I do not, however, find any evidence that the other two tax avoidance incentives (financial constraints and hedge fund interventions) affect a firm's propensity to lobby on tax issues. For financial constraints, this may be explained by financially constrained firms having limited resources to invest in lobbying.

Additional Robustness Tests

I conduct several untabulated robustness tests to mitigate potential concerns with my empirical specification. First, I examine whether my results hold with alternative scalars for my dependent variable (as opposed to the total number of employees). I re-estimate my main regressions using total assets as the denominator of choice. With the exception of one specific financial constraints index (the Altman's Z-Score), my results are robust to this specification. I also find that my results are robust to using the logarithm of tax department size as my dependent variable, as opposed to scaling it.

Next, I address the possibility that my results may be driven by the fact that tax department size is increasing over time. While year fixed effects mitigate this concern, it is possible that larger firms experience greater increases in tax personnel over time relative to the average, which may bias my results. To address this, I re-estimate my regressions by interacting each year fixed effect with indicator variables representing which size decile (measured using assets) the firm belongs to, creating a set of separate year dummies for firms in each size decile. This allows the time trend in tax department size to vary for smaller vs. larger firms. My results are robust to this alternative specification.

Finally, I re-estimate my regressions using a Fixed-Effect Poisson (FEP) regression model, as opposed to OLS. One potential concern with the use of OLS in my main analyses is that, since the number of tax employees is a discrete variable taking on integer values only, a count data regression model (using the unscaled number of employees as the dependent variable) may be more appropriate than an OLS model (e.g. Rock, Sedo and Willenborg (2001)). The FEP model is appropriate for analyzing count data and is very robust to distributional assumptions[46]. I find that all my results are robust to using the FEP model, as opposed to OLS.

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[46] Wooldridge (1999) shows that the FEP model, when estimated using the quasi-maximum likelihood estimator (QMLE), provides consistent estimates even when the underlying distribution is not Poisson, and only the conditional mean assumption needs to hold. Further, robust standard errors can be computed which are robust to over-dispersion, variance assumptions, and serial correlation.

CHAPTER VI

CONCLUSION

In this study, I examine whether managers respond to tax avoidance incentives by increasing investments made in the firm's tax department. Using four types of incentives examined in prior literature – financial constraints, equity risk incentives, hedge fund interventions and analyst cash flow forecasts, and employing a novel dataset of tax department employees collected from the professional networking website *LinkedIn*, I find that the number of tax personnel employed by the firm increases with each of the four incentives. This suggests that managers, in response to various tax avoidance incentives, allocate resources to employing human capital within the tax department. My results are consistent with prior literature suggesting that managerial influence over firm tax planning is limited to 'tone at the top' effects, such as their ability to invest resources into the tax function.

Overall, my study complements prior literature examining these tax avoidance incentives by highlighting how *inputs* of the tax function are affected by these incentives, in contrast with prior studies that only focus on *outputs* of the tax function (i.e. tax savings). The intuitive appeal of this approach is that it directly links these incentives with a specific managerial action (i.e. tax department hiring), rather than the outcomes of these actions. The common definition of an 'incentive' involves the incitement of action and effort. However, since tax avoidance is not an area that managers generally specialize in, it is unlikely that managers exert effort personally in the development and execution of tax strategies. The results of my study suggest that the 'action and effort' incited by these incentives may be observable through an increase in the amount of resources invested in the tax department by the manager. Future researchers examining tax avoidance incentives

may wish to strengthen their results by demonstrating, in conjunction with improved tax avoidance outcomes, that their incentive measure is related to an increase in tax function investments.

APPENDIX A

VARIABLE DEFINITIONS

Variable Name	Definition
Main Variables:	
TAXDEPT_SIZE	The total number of employees working in the firm with the word 'tax' in the job title, less employees that work in a non-income tax area (e.g. sales and property tax), scaled by total employees (*EMP*). *Source: LinkedIn*
Altman Z-Score	Measure of financial distress introduced in Altman (1968), computed as: -1*{3.3*[(PI+XINT)/AT]+1.2*(WCAP/AT) +(SALE/AT) +1.4*(RE/AT) +0.6*[(CSHO*PRCC_F)/LT]}
KZ Index	The Kaplan and Zingales (1997) financial constraints index, computed as: -1*[(IB+DP)/lag(PPENT)]+0.28*[(AT+PRCC_F*CSHO-CEQ TXDB)/AT]+3.13*[(DLTT+DLC)/(DLTT+DLC+SEQ)]- 39.36*[(DVC+DVP)/lag(PPENT)]-1.31*(CHE/lag(PPENT))
WW Index	The Whited and Wu (2006) financial constraints index, computed as: 0.091*(IB+DP)/AT - 0.062*(Dividend Dummy) +0.021*DLTT/AT - 0.044*Ln(AT) + 0.102*(Average Industry Sales Growth) - 0.035*(Sales Growth)
Textual	Textual analysis measure of financial constraints used in Law and Mills (2015), computed as the number of negative words divided by the total number of words in the 10-K. Examples include: loss, against, limitation, impairment and adverse.
Combined Index	The first component extracted from a principal components analysis of *Altman Z-Score, KZ Index, WW Index,* and *Textual.*
CEO (CFO) Vega	The change in the option portfolio value of the CEO (CFO) for a 1% change in the stock return volatility of the firm. See Core and Guay (2002). *Source: Execucomp*
Post Hedge Fund	An indicator variable equal to 1 for all firm-years after a firm is first targeted by a hedge fund, and 0 for firm-years prior to the hedge fund invention, as well as for firms that have never been targeted by a hedge fund. *Source: AuditAnalytics*
Post Cash Flow Forecast	An indicator variable equal to 1 for all firm-years after a firm receives its first cash flow forecast from an analyst, and 0 for

firm-years prior to the first forecast, as well as for firms that have never received a cash flow forecast. *Source: I/B/E/S*

Control Variables:

SIZE	The natural logarithm of assets (AT)
LN_SEGMENTS	The natural logarithm of 1 plus the number of business segments in the firm.
ROA	Pre-tax income (PI) divided by lagged assets (AT)
BTM	Book value of common equity (CEQ) divided by market value of equity (CSHO*PRCC_F)
FIRM_AGE	The natural logarithm of the current fiscal year (FYEAR) minus the first fiscal year that the firm is in Compustat
LEVERAGE	Long-term debt (DLTT + DLC), divided by assets (AT).
PPE	Net property, plant and equipment (PPENT) divided by assets (AT)
RD	R&D expenditures (XRD) divided by lagged assets (AT).
INTANG	Intangible assets (INTAN) divided by assets (AT)
INVENTORY	Inventory (INVT) divided by assets (AT)
NOL	Indicator variable equal to 1 if tax-loss carryforwards (TLCF) are greater than 0.
CHANGE_NOL	Change in tax-loss carryforwards (TLCF) divided by lagged assets
FOR_DUMMY	Indicator variable equal to 1 if foreign pre-tax income, tax expense or deferred tax expense (PIFO, TXFO, TXDFO) is greater than 0.
FOR_INCOME	Foreign pretax income (PIFO) divided by lagged assets (AT)
LN_HAVENS	The natural logarithm of one plus the number of tax haven subsidiaries that the firm is present in. *Source: Scott Dyreng's Ex. 21 dataset*
TAX_FEES	The natural logarithm of 1 + tax fees paid to the auditor, in thousands. *Source: AuditAnalytics*
LN_EMPLOYEES	Natural logarithm of the number of employees in the firm (EMP)
SG&A	Selling, general & admin expenses (XSGA), divided by lagged assets
CEO (CFO) DELTA	The change in the portfolio value of the CEO (CFO) for a 1% change in the stock price of the firm. See Core and Guay (2002).

CEO (CFO) AGE	Age of the CEO (CFO).
LN_ANALYSTS	Natural logarithm of one plus the number of analysts following the firm.

Other Variables:

NUM JUNIOR (NUM SENIOR)	Number of tax employees on *LinkedIn* with an analyst-level (manager or executive-level) job title, scaled by *EMP*. Junior job titles include: analyst, accountant and specialist. Senior job titles include: manager, director, and counsel.
NUM PUBLIC ACCT (NUM TAX DEPT)	Number of senior tax employees on *LinkedIn* with experience in a public accounting firm (tax department) prior to hire, scaled by *EMP*. *NUM PUBLIC ACCT* excludes employees who also have tax department experience. Public accounting experience is identified as having a public accounting firm as the job location (identified through internet searches). Tax department experience is identified by having 'tax' in the job title, and a corporation as the job location (identified through internet searches).
NUM GRAD (NUM NO GRAD)	Number of senior tax employees on *LinkedIn* with (without) a relevant graduate degree (e.g. MAcc, MTAX, JD or LLM), scaled by *EMP*
HIRED_SENIOR	Indicator variable equal to 1 if the firm hired a senior tax employee during the year
INCENTIVE_SHOCK	For financial constraints and equity risk incentives, an indicator variable equal to 1 if the firm experienced an increase in the respective incentive variable in the top 25th percentile of all changes in the year. For hedge funds (cash flow forecasts), an indicator variable equal to 1 in the year that the firm is targeted by a hedge fund (receives a cash flow forecast for the first time).
TOTAL_FEES	The logarithm of total fees paid to the auditor (TOTAL_FEES)
LOBBY(0/1)	Indicator variable equal to 1 if the firm incurred lobbying expenditures on a tax-specific issue. *Source: OpenSecrets Database*

APPENDIX B

DIFFERENTIAL TAX DEPARTMENT EFFECTS

To provide evidence that my main results are driven by firms avoiding taxes in response to each incentive, I partition my sample into two similar-sized groups based on whether the firm reduced their tax liability after experiencing increases in each incentive. My results, if indeed reflective of tax avoidance, should be concentrated in the group of firms that actually avoid taxes when these incentives increase.

Beginning with financial constraints, I compute, for each firm, an intra-firm correlation (using the Pearson correlation coefficient) between the firm's annual Cash ETR and the financial constraint measure. Next, I separate all firms in the sample into two groups, split on the median value of the correlation coefficient. Firms with below-median correlations – i.e. firms that experience larger decreases in taxes paid as their financial constraints increase, are classified as 'tax avoiders' for the purpose of this analysis. I do this separately for each financial constraint measure, and then repeat my main analyses on the two subsamples formed. My results, presented in Table 9 Panel A, show that the tax department effects are stronger among the subsample of tax avoiders. With the exception of the KZ index, the relationship between each financial constraint index and tax department investments is stronger among the group of firms that experience larger reductions in Cash ETR as they become more financially constrained. Using the combined index, the magnitude of the effect is approximately 2.6 times larger in the 'tax avoiders' subsample.

For the equity risk incentives, I repeat the above procedure for both the CEO and CFO vega, except that I use the Discretionary Permanent Book-Tax Differences (DTAX)

measure developed in Frank, Lynch and Rego (2009) as opposed to the Cash ETR measure. Since equity risk compensation incentivizes managers to engage in more aggressive tax reporting (Rego and Wilson (2012)), as opposed to all forms of tax avoidance, the DTAX measure better captures this effect. Firms with higher within-firm correlations between DTAX and the CEO or CFO vega are classified as 'tax avoiders' as these firms become more tax aggressive in response to increases in equity risk incentives. Panel B shows that the tax department effects are indeed more concentrated in the tax avoiders subsample, particularly for the CFO incentive.

Finally, for hedge funds and analyst cash flow forecasts, I divide the treatment firms into two groups based on the change in the firm's average Cash ETR following the treatment event[47]. Firms that experience greater declines in Cash ETR after receiving the hedge fund intervention (analyst cash flow forecast) are classified as 'tax avoiders' while the other treatment firms are classified as 'non-tax avoiders'. Next, I conduct two separate regressions, classifying tax avoiders and non-tax avoiders as the treatment firms, respectively. Panel C shows that the tax department effects are significantly greater when tax avoiders are used as the treatment group – firms that avoid more taxes after being targeted by an activist hedge fund also invest more in tax departments following the event. Panel D shows similar inferences with analyst cash flow forecasts – firms that avoid more taxes after receiving an analyst cash flow forecast also experience larger increases in tax department investments.

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[47] I first compute the firm's average Cash ETR for all years in the sample prior to the treatment event, and the firm's average Cash ETR for all years following the event (including the treatment year itself). I use the difference between the two averages as the measure of the ETR change.

FIGURE 1: Reported Skillset by Tax Employees

FIGURE 2: Differential Effect of Tax Avoidance Incentives by Employee Type

Effect of Incentives on Senior vs. Junior Employee Investment

Effect of Incentives on Tax Dept vs. Accounting Firm Employee Investment

Effect of Incentives on Grad Degree vs. No Grad Degree Employee Investment
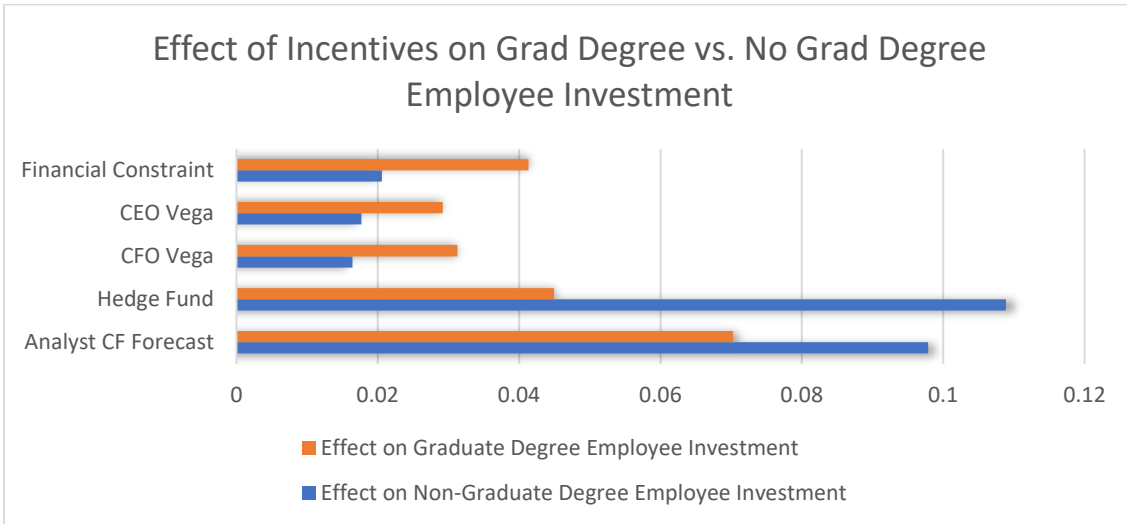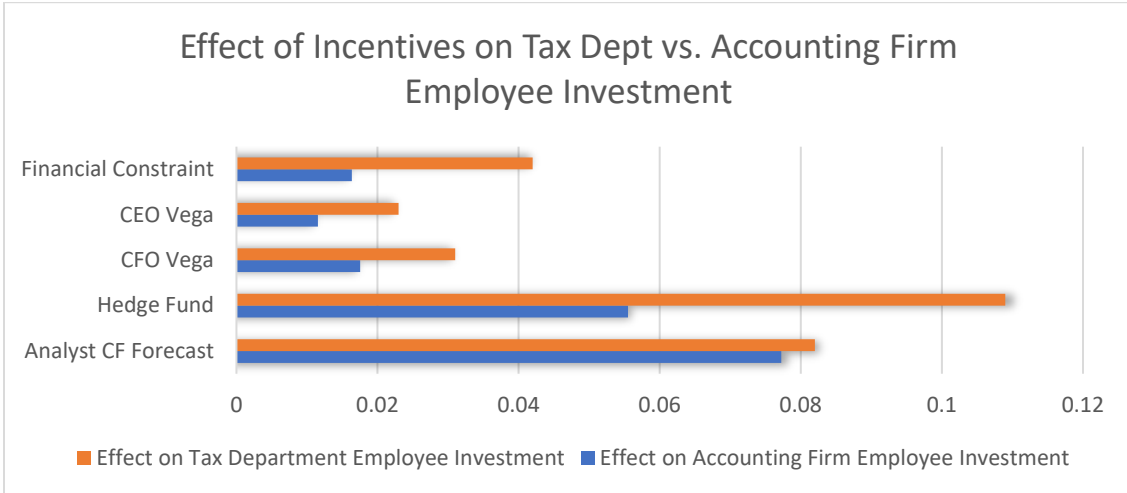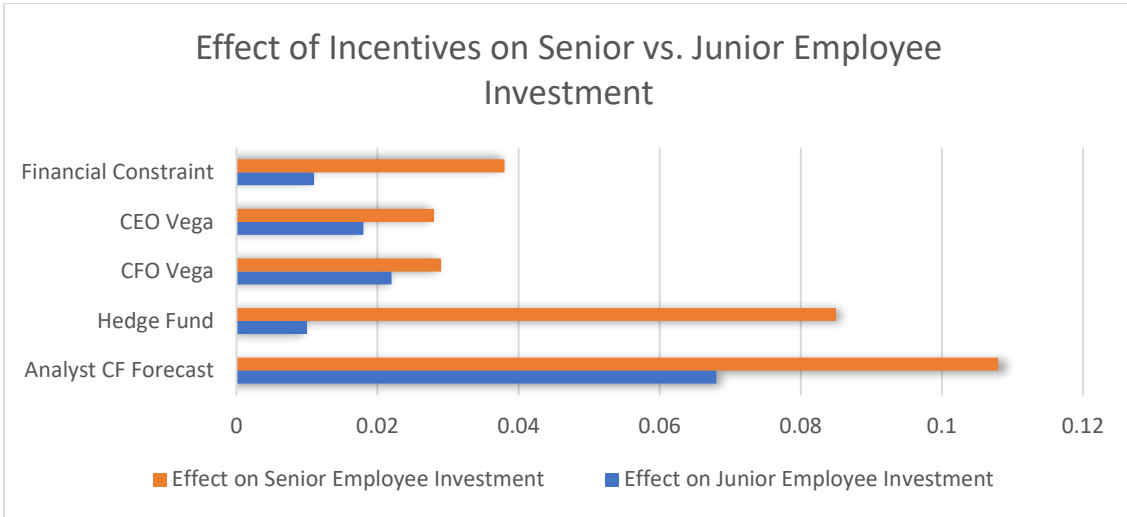
FIGURE 3: Effect of Tax Avoidance Incentive Shocks on Probability of Tax Department Hiring
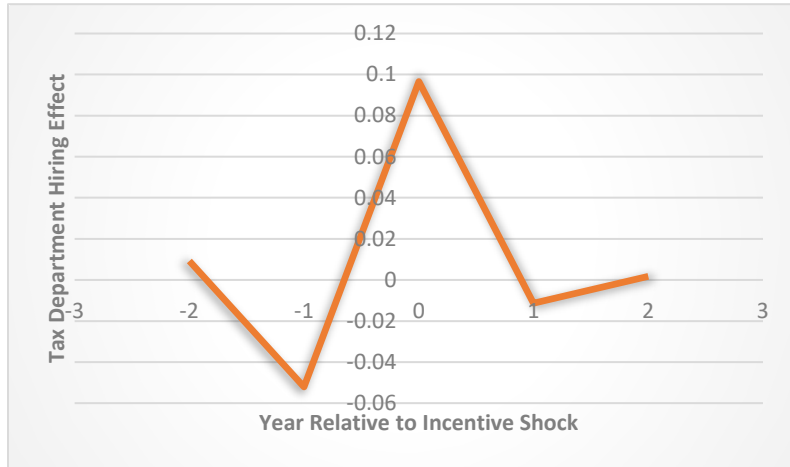
Figure 3-1: Financial Constraints (Combined Index)
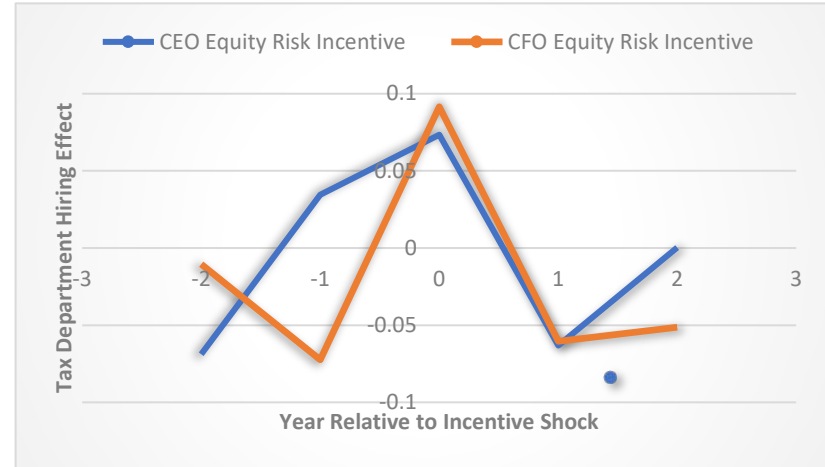
Figure 3-2: Equity Risk Incentives
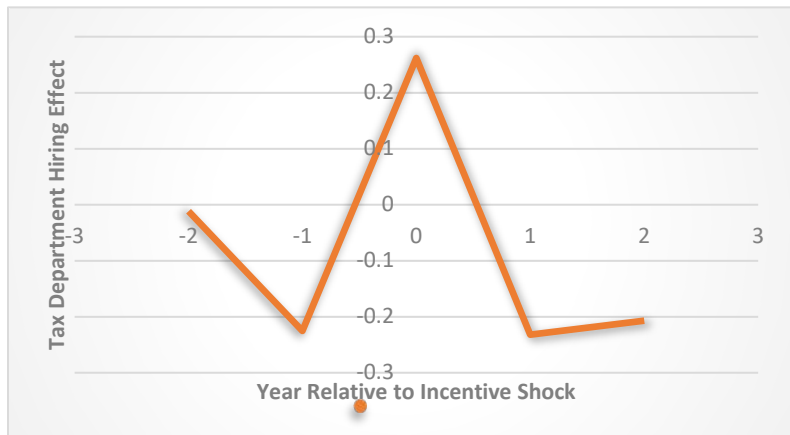
Figure 3-3: Hedge Fund Intervention
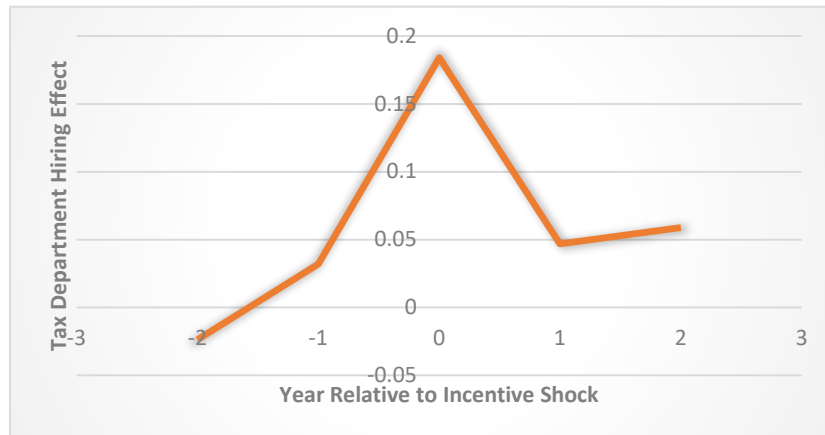
Figure 3-4: Analyst Cash Flow Forecast

TABLES

TABLE 1: Sample Selection

Panel A: Sample Selection of Firms

	Firms
Number of US-incorporated firms in Compustat after the year 2000 with non-missing assets over $10M	**11,694**
Less: Financial firms (SIC 6000-6899)	(2,658)
Less: Firm with consistently missing Compustat data	(2,150)
Total number of firms searched on the *LinkedIn* website	**6,886**
Number of Firms with Tax Employees: Number of Firms without Tax Employees*:*	3,311 3,575
Total Number of Firm-Years:	65,647
Less: Firm-Years with missing financial data on Compustat:	(18,804)
Number of Observations in Sample:	**46,843**[48]
Number of Firm-Years with Tax Employees: Number of Firm-Years without Tax Employees:	23,837 23,006

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[48] Note that the final number of observations in each regression will be dependent on the data availability of the tax avoidance incentive variable. Analyses involving incentive data that is only collected for S&P 1500 firms (i.e. CEO & CFO equity risk incentives and hedge fund activism) will have a much smaller sample size.

TABLE 1: Sample Selection

Panel B: Employees in Sample

	Number of firm-employees
Total number of tax employees based in the United States and employed in a sample firm-year	**39,876**
Less: Employees who did not work in the income tax function (e.g. sales tax, payroll tax, property tax)	(8,794)
Number of Income Tax Employees:	**31,082**
Number of Analysts:	**14,430**
Number of Managers:	**9,435**
Number of Executives:	**7,217**

TABLE 2: Corporate Tax Department Characteristics

Panel A: Average Tax Department Size (# of US-Based Employees)

	N	Mean	Q25	Q50	Q75
All Firm-Years with Tax Departments					
US Tax Department Size (all functions)	23,837	7.97	2	4	8
US Tax Department Size (income tax only)	23,837	6.44	1	3	7
S&P 1500 Firm-Years with Tax Departments					
US Tax Department Size (all functions)	15,096	10.31	2	5	11
US Tax Department Size (income tax only)	15,096	8.25	2	4	8

Panel B: Tax Department Size by Firm Size and Industry

Size Quartile (Total Assets)	N	Mean	Q25	Q50	Q75
1	5,960	2.12	1	1	3
2	5,959	3.57	2	3	5
3	5,959	6.05	3	5	8
4	5,959	20.13	7	13	24

Industry (Fama French 12 Classification)	N	Mean	Q25	Q50	Q75
Consumer Non-Durables (Food etc.)	1,731	7.44	2	4	9
Consumer Durables (Cars, TVs, etc.)	893	6.37	2	4	6
Manufacturing	3,588	6.49	2	4	7.5
Oil, Gas and Coal	1,256	9.93	2	4	10
Chemicals and Allied Products	963	8.46	2	5	12
Business Equipment (Computers etc.)	5,454	7.31	1	3	7
Telephone and TV Transmission	892	16.49	2	4	14
Wholesale, Retail and Services	3,829	8.84	2	4	10
Healthcare and Medical Equipment	1,744	7.37	1	3	8
Other	3,487	7.40	2	3	8

TABLE 2: Corporate Tax Department Characteristics

Panel C: Largest US-Based Corporate Tax Departments in Sample (2016)

Rank	Company	# US Tax Employees on *LinkedIn*
1	General Electric	287
2	Amazon.com	249
3	Oracle	184
4	Verizon Communications	176
5	AT&T	170
6	IBM	140
7	Walmart	125
8	Exxon Mobil	120
9	United Technologies	107
10	Johnson & Johnson	105

TABLE 2: Corporate Tax Department Characteristics

Panel D: Income Tax Employee Characteristics

	Analyst Rank N = 14,430	Manager Rank N = 9,435	Executive Rank N = 7,217
Prior Work Experience (Before Joining Firm):			
Average Number of Years Worked:	4.61	9.96	14.24
As a Manager:	0.61	4.67	6.55
As an Executive:	0.04	0.66	5.01
% of Employees with Experience in			
Big N Accounting Firm:	25.6%	65.7%	77.4%
Non-BigN Accounting/Consulting Firm:	22.8%	27.3%	17.7%
Financial Institution:	11.6%	14.1%	14.4%
Law Firm:	1.8%	4.6%	11.3%
Government Agency (e.g. IRS):	2.5%	3.5%	3.6%
Public Corporation (Tax Department):	22.1%	41.9%	52.9%
Private Corporation (Tax Department):	9.1%	17.6%	21.9%
Educational Background			
% of Employees whose <u>Highest</u> Attained Education is:			
Undergraduate Degree:	46.6%	32.7%	22.1%
Undergraduate in Accounting:	35.9%	28.1%	20.0%
Graduate Degree:	52.3%	66.9%	77.5%
MTax or MAcc with Tax Specialization:	20.4%	36.5%	37.6%
Other MAcc:	18.3%	13.5%	9.0%
Law Degree (JB or LLM):	3.2%	10.9%	27.9%
Attended a Top 20 Business School[49]:	4.8%	11.0%	20.8%
Other Characteristics			
Average Age (while employed in company):	32.4	38.4	43.9
Gender (% Female):	47.6%	39.5%	25.8%
Average Tenure (# of Years):	3.69	5.04	6.39

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[49] Business school rankings are obtained from the US News 'Best Business Schools'
(https://www.usnews.com/best-graduate-schools/top-business-schools/mba-rankings)

TABLE 2: Corporate Tax Department Characteristics

Panel E: Most Frequent Employers and Educational Institutions

Rank	Prior Employer	% Tax Employees
1	PricewaterhouseCoopers	14.1%
2	Ernst & Young	11.2%
3	Deloitte	10.9%
4	KPMG	8.8%
5	Arthur Andersen	4.9%
6	Grant Thornton	2.5%
7	RSM/McGladrey	1.3%
8	BDO	1.3%

Rank	Educational Institution	% Tax Employees
1	Golden Gate University	2.8%
2	DePaul University	2.1%
3	Univ. of Texas at Austin	2.0%
4	New York University	1.9%
5	University of Washington	1.8%
6	Bentley University	1.8%
7	University of Houston	1.6%
8	UIUC	1.5%

TABLE 3: Descriptive Statistics: Regression Variables

Panel A: Main and Control Variables

	N	Mean	SD	Q25	Q50	Q75
Main Variables						
TAXDEPT_SIZE	46,843	0.658	1.401	0.000	0.046	0.678
Financial Constraints:						
Altman Z-Score	42,450	-3.981	5.138	-5.109	-3.136	-1.693
KZ Index	44,385	-8.836	28.063	-6.454	-1.191	0.850
WW Index	46,416	-0.274	0.106	-0.348	-0.271	-0.197
Textual	38,385	0.016	0.004	0.014	0.016	0.019
Combined Index	32,700	-0.078	0.816	-0.550	-0.078	0.398
Equity Risk Incentives:						
CEO Vega ($M)	16,269	0.137	0.217	0.015	0.054	0.157
CFO Vega ($M)	12,628	0.034	0.055	0.004	0.014	0.038
Analyst Cash Flow Forecasts:						
Post Cash Flow Forecast	40,073	0.433	0.496	0.000	0.000	1.000
% of Firms Treated	40,073	50.6%				
Hedge Fund Intervention:						
Post Hedge Fund	16,617	0.119	0.324	0.000	0.000	0.000
% of Firms Treated	16,617	18.5%				
Control Variables						
SIZE	46,843	6.065	1.952	4.583	6.003	7.422
LN_SEGMENTS	46,843	1.080	0.433	0.693	0.693	1.386
ROA	46,843	0.029	0.191	-0.028	0.053	0.123
BTM	46,843	0.569	0.984	0.256	0.468	0.794
FIRM_AGE	46,843	18.335	11.366	9.000	16.000	28.000
LEVERAGE	46,843	0.222	0.221	0.017	0.180	0.344
PPE	46,843	0.248	0.223	0.076	0.174	0.353
R&D	46,843	0.041	0.075	0.000	0.000	0.052
INTANG	46,843	0.178	0.195	0.011	0.106	0.290
INVENTORY	46,843	0.127	0.139	0.010	0.088	0.191
NOL	46,843	0.499	0.500	0.000	0.000	1.000
CHANGE_NOL	46,843	0.035	0.190	0.000	0.000	0.009
FOR_DUMMY	46,843	0.598	0.490	0.000	1.000	1.000
FOR_INCOME	46,843	0.012	0.031	0.000	0.000	0.014
LN_HAVENS	46,843	0.640	0.979	0.000	0.000	1.099
TAX_FEES	46,843	2.844	2.637	0.000	3.135	5.100
LN_EMPLOYEES	46,843	0.458	1.983	-0.997	0.464	1.859
SG&A	46,843	0.330	0.283	0.130	0.256	0.442

TABLE 3, Panel A (Continued)

	N	Mean	SD	Q25	Q50	Q75
CEO_DELTA ($M)	16,269	0.619	1.322	0.081	0.211	0.565
CEO_AGE	16,269	55.386	7.113	50.000	55.000	60.000
CFO_DELTA ($M)	12,628	0.082	0.122	0.015	0.039	0.093
CFO_AGE	12,628	50.330	6.504	46.000	50.000	55.000
LN_ANALYSTS	46,843	1.850	1.187	0.693	2.079	2.773

TABLE 3: Descriptive Statistics: Regression Variables

Panel B: Additional Variables

	N	Mean	SD	Q25	Q50	Q75
Variables in Additional Tests						
Table 5:						
NUM JUNIOR	46,843	0.189	0.519	0.000	0.000	0.118
NUM SENIOR	46,843	0.440	0.955	0.000	0.000	0.426
NUM PUBLIC ACCT	46,843	0.115	0.352	0.000	0.000	0.024
NUM TAX DEPT	46,843	0.210	0.552	0.000	0.000	0.116
NUM GRAD	46,843	0.251	0.618	0.000	0.000	0.187
NUM NO GRAD	46,843	0.170	0.485	0.000	0.000	0.088
Table 6:						
HIRED_SENIOR	25,723	0.286	0.452	0.000	0.000	1.000
Hedge Fund Initiation	12,853	0.023	0.149	0.000	0.000	0.000
First CF Forecast	20,085	0.062	0.241	0.000	0.000	0.000
Table 7:						
TOTAL_FEES	42,740	13.614	1.437	12.626	13.651	14.537
Table 8:						
LOBBY(0/1)	46,843	0.074	0.262	0.000	0.000	0.000

TABLE 4: The Relationship Between Tax Avoidance Incentives and Tax Department Investments

Panel A: Financial Constraints and Equity Risk Incentives

	Financial Constraint Indices					Equity Risk Incentives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
INCENTIVE =	Altman Z-Score	KZ Index	WW Index	Textual	Combined	CEO Vega	CFO Vega
INCENTIVE	0.025**	0.029***	0.035*	0.014**	0.044***	0.038***	0.039**
	(1.894)	(2.616)	(1.431)	(1.666)	(3.410)	(2.713)	(2.408)
SIZE	0.206***	0.207***	0.202***	0.176***	0.213***	0.240***	0.269***
	(4.617)	(4.927)	(4.816)	(3.734)	(4.200)	(3.178)	(2.999)
LN_SEGMENTS	-0.098***	-0.081**	-0.074**	-0.052	-0.073*	-0.108**	-0.124**
	(-2.610)	(-2.023)	(-1.969)	(-1.341)	(-1.772)	(-2.074)	(-2.087)
ROA	-0.029	-0.072	-0.096*	-0.136**	-0.039	-0.209	-0.192
	(-0.471)	(-1.301)	(-1.680)	(-2.323)	(-0.541)	(-1.416)	(-1.062)
BTM	-0.008	-0.004	-0.003	-0.005	-0.009	-0.028	-0.007
	(-1.099)	(-0.607)	(-0.476)	(-0.727)	(-1.233)	(-1.254)	(-0.300)
FIRM_AGE	0.017	0.025**	0.024**	0.038***	0.029*	0.110***	0.092***
	(1.567)	(2.260)	(2.237)	(2.675)	(1.892)	(4.180)	(3.836)
LEVERAGE	0.020	0.088	0.082	0.052	-0.059	-0.159	-0.143
	(0.297)	(1.324)	(1.241)	(0.686)	(-0.807)	(-1.201)	(-1.182)
PPE	0.347**	0.332**	0.382***	0.278*	0.392**	0.416*	0.338
	(2.226)	(2.260)	(2.684)	(1.674)	(2.319)	(1.799)	(1.357)
RD	-0.757***	-0.968***	-0.926***	-0.928***	-0.960***	-0.671	-0.637
	(-3.194)	(-4.041)	(-3.928)	(-3.503)	(-3.472)	(-1.466)	(-1.228)
INTANG	-0.213**	-0.166**	-0.123	-0.163*	-0.152	-0.093	-0.164
	(-2.552)	(-1.971)	(-1.523)	(-1.732)	(-1.625)	(-0.733)	(-1.144)
INVENTORY	-0.009	0.044	-0.031	-0.013	0.053	0.084	0.386
	(-0.050)	(0.263)	(-0.178)	(-0.066)	(0.277)	(0.239)	(1.019)
NOL	0.041**	0.034*	0.030	0.024	0.032*	0.016	-0.003
	(2.216)	(1.803)	(1.631)	(1.232)	(1.705)	(0.596)	(-0.096)
CHANGE_NOL	-0.029	-0.005	-0.021	-0.047	-0.065**	-0.101	-0.131*

	Financial Constraint Indices					Equity Risk Incentives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
INCENTIVE =	Altman Z-Score	KZ Index	WW Index	Textual	Combined	CEO Vega	CFO Vega
	(-0.986)	(-0.177)	(-0.721)	(-1.581)	(-1.986)	(-1.310)	(-1.673)
FOR_DUMMY	0.064**	0.094***	0.099***	0.120***	0.070**	0.020	0.088*
	(2.215)	(3.108)	(3.305)	(3.742)	(2.425)	(0.506)	(1.819)
FOR_INCOME	-0.432	-0.258	-0.246	-0.028	-0.039	0.127	-0.404
	(-1.331)	(-0.817)	(-0.802)	(-0.082)	(-0.117)	(0.223)	(-0.700)
LN_HAVENS	0.022	0.015	0.016	0.013	0.021	0.020	0.026
	(1.485)	(0.964)	(1.097)	(0.888)	(1.335)	(1.198)	(1.356)
TAX_FEES	0.004	0.002	0.002	0.002	0.002	-0.002	-0.001
	(1.161)	(0.685)	(0.686)	(0.485)	(0.573)	(-0.348)	(-0.120)
LN_EMPLOYEES	-0.405***	-0.416***	-0.409***	-0.414***	-0.395***	-0.702***	-0.797***
	(-8.572)	(-9.491)	(-9.483)	(-7.705)	(-7.363)	(-8.015)	(-6.950)
SGA	0.056	0.056	0.050	0.051	0.094	-0.003	0.125
	(0.992)	(0.915)	(0.833)	(0.759)	(1.303)	(-0.019)	(0.636)
CEO_DELTA						-0.021*	
						(-1.950)	
CEO_AGE						-0.001	
						(-0.400)	
CFO_DELTA							-0.361***
							(-2.589)
CFO_AGE							0.002
							(1.032)
Observations	42,450	44,385	46,416	38,385	32,700	16,269	12,628
R-squared	0.084	0.084	0.084	0.083	0.082	0.161	0.161
Firm Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the results of estimating OLS Regressions of tax department size (scaled by number of employees) on a set of tax avoidance incentives. All variables are calculated as described in Appendix A. Variables are winsorized at the 1st and 99th percentiles. Standard errors are robust and clustered by firm. T-statistics are presented in parantheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 4: The Relationship Between Tax Avoidance Incentives and Tax Department Investments

Panel B: Hedge Fund Intervention and Analyst Cash Flow Forecast Initiation

	Unadjusted Sample		Entropy-Balanced Sample	
	(1)	(2)	(3)	(4)
INCENTIVE =	Post Hedge Fund	Post Cash Flow Forecast	Post Hedge Fund	Post Cash Flow Forecast
INCENTIVE	0.096**	0.140***	0.105**	0.097**
	(1.706)	(4.608)	(1.811)	(2.282)
SIZE	0.236***	0.101**	0.241**	0.132**
	(3.207)	(2.575)	(2.189)	(2.224)
LN_SEGMENTS	-0.117**	-0.050	-0.104	-0.045
	(-2.232)	(-1.302)	(-1.352)	(-0.858)
ROA	-0.199	-0.073	0.048	-0.146*
	(-1.398)	(-1.323)	(0.208)	(-1.716)
BTM	-0.024	0.000	-0.024	-0.004
	(-1.098)	(0.066)	(-0.979)	(-0.234)
FIRM_AGE	0.108***	0.028***	0.131***	0.032***
	(4.106)	(2.623)	(3.683)	(2.845)
LEVERAGE	-0.147	0.107	-0.029	0.056
	(-1.116)	(1.581)	(-0.170)	(0.435)
PPE	0.430*	0.111	0.385	0.087
	(1.872)	(0.791)	(1.262)	(0.432)
RD	-0.580	-0.885***	-0.338	-1.011***
	(-1.294)	(-3.679)	(-0.516)	(-2.650)
INTANG	-0.111	-0.095	0.016	-0.220
	(-0.868)	(-1.134)	(0.091)	(-1.516)
INVENTORY	0.025	-0.122	0.162	-0.207
	(0.073)	(-0.669)	(0.295)	(-0.566)
NOL	0.015	0.029	0.025	0.064**
	(0.594)	(1.498)	(0.644)	(2.158)
CHANGE_NOL	-0.088	-0.006	-0.074	0.021

TABLE 4, Panel B (Continued)

	Unadjusted Sample		Entropy-Balanced Sample	
	(1)	(2)	(3)	(4)
INCENTIVE =	**Post Hedge Fund**	**Post Cash Flow Forecast**	**Post Hedge Fund**	**Post Cash Flow Forecast**
	(-1.149)	(-0.217)	(-0.785)	(0.448)
FOR_DUMMY	0.016	0.119***	0.037	0.101**
	(0.419)	(3.732)	(0.652)	(2.348)
FOR_INCOME	0.141	0.033	-0.176	-0.085
	(0.252)	(0.106)	(-0.262)	(-0.195)
LN_HAVENS	0.020	0.032*	0.013	0.071**
	(1.214)	(1.864)	(0.489)	(2.194)
TAX_FEES	-0.002	0.003	-0.003	0.001
	(-0.420)	(0.765)	(-0.447)	(0.165)
LN_EMPLOYEES	-0.678***	-0.328***	-0.783***	-0.380***
	(-7.893)	(-7.188)	(-5.929)	(-6.560)
SGA	-0.020	-0.005	-0.142	-0.015
	(-0.128)	(-0.095)	(-0.739)	(-0.188)
CEO_VEGA	0.151**		0.189	
	(2.514)		(1.424)	
CEO_DELTA	-0.021**		-0.030	
	(-2.055)		(-1.430)	
LN_ANALYSTS		0.019		0.034
		(1.086)		(1.379)
Observations	16,617	40,073	16,617	40,073
R-squared	0.161	0.071	0.169	0.146
Firm Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES

Note: This table presents the results of estimating Difference-in-Differences Regressions of tax department size (scaled by number of employees), using hedge fund interventions and analyst cash flow forecasts as the treatment event. All variables are calculated as described in Appendix A. Variables are winsorized at the 1st and 99th percentiles. Standard errors are robust and clustered by firm. T-statistics are presented in parentheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 5: Differential Effects by Employee Type

Panel A: Junior vs. Senior Employees
Financial Constraints (Combined Measure)

Dependent Variable	(1) NUM JUNIOR	(2) NUM SENIOR
INCENTIVE	0.011	0.038***
	(1.322)	(3.691)
Observations	32,700	32,700
R-squared	0.047	0.061
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Equity Risk Incentives

	CEO Vega		CFO Vega	
	(1)	(2)	(3)	(4)
Dependent Variable	NUM JUNIOR	NUM SENIOR	NUM JUNIOR	NUM SENIOR
INCENTIVE	0.018	0.028***	0.022	0.029***
	(1.542)	(2.734)	(1.495)	(2.612)
Observations	16,269	16,269	12,628	12,628
R-squared	0.091	0.115	0.090	0.115
Controls & FEs	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM

Hedge Fund Intervention

Dependent Variable	(1) NUM JUNIOR	(2) NUM SENIOR
INCENTIVE	0.010	0.085**
	(0.222)	(2.013)
Observations	16,617	16,617
R-squared	0.091	0.115
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Analyst Cash Flow Forecasts

Dependent Variable	(1) NUM JUNIOR	(2) NUM SENIOR
INCENTIVE	0.068***	0.108***
	(2.827)	(4.608)
Observations	40,073	40,073
R-squared	0.041	0.052
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

TABLE 5: Differential Effects by Employee Type

Panel B: Public Accounting vs. Tax Department Employees
Financial Constraints (Combined Measure)

Dependent Variable	(1) NUM PUBLIC ACCT	(2) NUM TAX DEPT
INCENTIVE	0.016	0.042***
	(1.472)	(4.250)
Observations	32,700	32,700
R-squared	0.044	0.051
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Equity Risk Incentives

	CEO Vega		CFO Vega	
	(1)	(2)	(3)	(4)
Dependent Variable	NUM PUB ACCT	NUM TAX DEPT	NUM PUB ACCT	NUM TAX DEPT
INCENTIVE	0.012	0.023**	0.018	0.031**
	(1.031)	(1.972)	(1.303)	(2.386)
Observations	16,269	16,269	12,628	12,628
R-squared	0.064	0.078	0.064	0.065
Controls & FEs	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM

Hedge Fund Intervention

Dependent Variable	(1) NUM PUB ACCT	(2) NUM TAX DEPT
INCENTIVE	0.055	0.109**
	(1.232)	(2.107)
Observations	16,617	16,617
R-squared	0.064	0.080
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Analyst Cash Flow Forecasts

Dependent Variable	(1) NUM PUB ACCT	(2) NUM TAX DEPT
INCENTIVE	0.077***	0.082***
	(2.578)	(3.079)
Observations	40,073	40,073
R-squared	0.036	0.043
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

TABLE 5: Differential Effects by Employee Type

Panel C: Graduate Degree vs. Non-Graduate Degree Employees

Financial Constraints (Combined Measure)

Dependent Variable	(1) NUM NO GRAD	(2) NUM GRAD
INCENTIVE	0.021**	0.041***
	(2.023)	(3.822)
Observations	32,700	32,700
R-squared	0.027	0.049
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Equity Risk Incentives

	CEO Vega		CFO Vega	
	(1)	(2)	(3)	(4)
Dependent Variable	NUM NO GRAD	NUM GRAD	NUM NO GRAD	NUM GRAD
INCENTIVE	0.018	0.029***	0.016	0.031***
	(1.505)	(2.925)	(1.528)	(2.699)
Observations	16,269	16,269	12,628	12,628
R-squared	0.042	0.089	0.047	0.084
Controls & FEs	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM

Hedge Fund Intervention

Dependent Variable	(1) NUM NO GRAD	(2) NUM GRAD
INCENTIVE	0.109**	0.045
	(2.208)	(1.080)
Observations	16,617	16,617
R-squared	0.044	0.087
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Analyst Cash Flow Forecasts

Dependent Variable	(1) NUM NO GRAD	(2) NUM GRAD
INCENTIVE	0.098***	0.070***
	(4.075)	(2.769)
Observations	40,073	40,073
R-squared	0.019	0.043
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

TABLE 6: The Role of Tax Avoidance Incentive Shocks in Triggering Tax Department Hiring

Panel A: Financial Constraints and Equity Risk Incentives

	Financial Constraints					Equity Risk Incentives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
INCENTIVE_SHOCK=	Z-Score Increase	KZ-Index Increase	WW-Index Increase	Text-Constraint Increase	Combined (PCA)	CEO Vega Increase	CFO Vega Increase
INCENTIVE_SHOCK	0.105**	0.165***	0.084**	0.061*	0.097**	0.073*	0.092*
	(2.192)	(3.403)	(1.989)	(1.420)	(1.792)	(1.326)	(1.391)
SIZE	0.296***	0.338***	0.326***	0.252***	0.297***	0.125	-0.033
	(3.378)	(4.004)	(4.135)	(2.625)	(2.638)	(0.856)	(-0.198)
LN_SEGMENTS	-0.055	-0.002	0.001	0.006	-0.020	0.075	0.038
	(-0.556)	(-0.018)	(0.011)	(0.057)	(-0.171)	(0.602)	(0.231)
ROA	0.042	0.067	0.084	0.100	0.090	-0.050	-0.127
	(0.212)	(0.348)	(0.458)	(0.473)	(0.361)	(-0.153)	(-0.311)
BTM	-0.035	-0.031	-0.044*	-0.038	-0.014	-0.098	-0.129*
	(-1.360)	(-1.173)	(-1.748)	(-1.231)	(-0.441)	(-1.581)	(-1.845)
FIRM_AGE	-0.051*	-0.035	-0.055**	-0.059	-0.032	-0.011	-0.014
	(-1.774)	(-1.216)	(-1.982)	(-1.361)	(-0.682)	(-0.131)	(-0.158)
LEVERAGE	-0.096	-0.056	-0.082	0.010	0.116	-0.386	-0.274
	(-0.535)	(-0.310)	(-0.489)	(0.052)	(0.536)	(-1.398)	(-0.848)
PPE	-0.136	0.015	-0.044	-0.088	-0.122	-0.284	-0.481
	(-0.379)	(0.043)	(-0.136)	(-0.223)	(-0.263)	(-0.526)	(-0.759)
RD	-2.106**	-2.150**	-2.412***	-1.903**	-2.428**	-1.749	-2.486
	(-2.259)	(-2.321)	(-2.946)	(-1.991)	(-2.193)	(-1.343)	(-1.502)
INTANG	0.932***	1.036***	1.089***	1.036***	1.072***	1.354***	0.640
	(3.641)	(4.160)	(4.625)	(3.816)	(3.435)	(3.569)	(1.340)
INVENTORY	0.492	0.620	0.833	0.198	0.334	1.347	0.317
	(0.759)	(0.998)	(1.416)	(0.299)	(0.455)	(1.437)	(0.272)
NOL	0.035	0.015	0.002	0.026	0.079	0.062	0.068
	(0.622)	(0.258)	(0.032)	(0.449)	(1.190)	(0.817)	(0.743)

	Financial Constraints					Equity Risk Incentives	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
INCENTIVE_SHOCK=	Z-Score Increase	KZ-Index Increase	WW-Index Increase	Text-Constraint Increase	Combined (PCA)	CEO Vega Increase	CFO Vega Increase
CHANGE_NOL	0.045	-0.087	0.024	0.032	-0.024	0.065	-0.099
	(0.315)	(-0.559)	(0.175)	(0.207)	(-0.126)	(0.251)	(-0.319)
FOR_DUMMY	0.194*	0.178*	0.215**	0.103	0.091	0.174	0.174
	(1.913)	(1.780)	(2.252)	(0.960)	(0.755)	(1.194)	(0.961)
FOR_INCOME	-0.112	-0.236	-0.408	-0.035	0.928	0.352	2.342
	(-0.131)	(-0.270)	(-0.502)	(-0.037)	(0.868)	(0.292)	(1.565)
LN_HAVENS	0.041	0.051	0.039	0.055	0.075*	0.058	0.061
	(1.070)	(1.326)	(1.074)	(1.343)	(1.687)	(1.190)	(1.021)
TAX_FEES	0.018*	0.022**	0.016	0.014	0.021	0.019	0.053***
	(1.688)	(2.075)	(1.596)	(1.167)	(1.540)	(1.263)	(2.847)
LN_EMPLOYEES	0.206**	0.195**	0.211**	0.155	0.067	0.272*	0.428***
	(2.259)	(2.155)	(2.496)	(1.505)	(0.552)	(1.857)	(2.722)
SGA	0.842***	0.976***	0.900***	0.699***	0.961***	0.592	0.399
	(3.131)	(3.959)	(3.997)	(2.765)	(3.068)	(1.383)	(0.826)
CEO_DELTA						-0.035	
						(-1.135)	
CEO_AGE						-0.014**	
						(-2.401)	
CFO_DELTA							-0.013
							(-0.039)
CFO_AGE							-0.007
							(-1.000)
Observations	20,855	20,982	23,822	18,519	14,642	11,067	7,877
Firm Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the results of CFEL Regressions modeling the relationship between the probability of hiring a senior tax employee and large increases to tax avoidance incentives. Variables are winsorized at 1st and 99th percentiles. Robust SEs are clustered by firm. T-stats are presented in parantheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 6: The Role of Tax Avoidance Incentive Shocks in Triggering Tax Department Hiring

Panel B: Hedge Fund Intervention and Analyst Cash Flow Forecasts

INCENTIVE_SHOCK =	(1) **Hedge Fund Initiation**	(2) **First CPS Forecast**
INCENTIVE_SHOCK	0.262**	0.184***
	(1.885)	(2.526)
SIZE	0.302**	0.377***
	(2.484)	(4.275)
LN_SEGMENTS	0.064	0.050
	(0.558)	(0.476)
ROA	0.147	-0.152
	(0.503)	(-0.846)
BTM	-0.088	-0.053*
	(-1.567)	(-1.832)
FIRM_AGE	-0.065	-0.064*
	(-0.782)	(-1.823)
LEVERAGE	-0.283	0.005
	(-1.173)	(0.030)
PPE	-0.270	-0.257
	(-0.555)	(-0.712)
RD	-0.235	-2.394***
	(-0.204)	(-2.932)
INTANG	1.027***	0.801***
	(3.050)	(3.262)
INVENTORY	0.907	0.172
	(1.144)	(0.274)
NOL	0.070	-0.002
	(1.011)	(-0.037)
CHANGE_NOL	0.129	0.085
	(0.581)	(0.592)

INCENTIVE_SHOCK =	(1) **Hedge Fund Initiation**	(2) **First CPS Forecast**
FOR_DUMMY	0.072	0.210**
	(0.553)	(2.215)
FOR_INCOME	-0.879	-0.716
	(-0.779)	(-0.833)
LN_HAVENS	0.057	0.043
	(1.282)	(1.041)
TAX_FEES	0.016	0.027**
	(1.186)	(2.473)
LN_EMPLOYEES	0.212*	0.207**
	(1.726)	(2.172)
SGA	0.813**	0.779***
	(2.231)	(3.663)
CEO_DELTA	0.003	
	(0.106)	
CEO_VEGA	-0.034	
	(-0.180)	
LN_ANALYSTS		0.007
		(0.146)
Observations	12,853	20,085
Firm Fixed Effects	YES	YES
Year Fixed Effects	YES	YES

Note: This table presents the results of estimating Conditional Fixed Effect Logit Regressions modeling the relationship between the probability of hiring a senior tax employee and large increases to tax avoidance incentives. All variables are calculated as described in Appendix A. Variables are winsorized at the 1st and 99th percentiles. Robust standard errors are clustered by firm. Z-statistics are presented in parentheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 7: The Relationship Between Tax Avoidance Incentives and Auditor-Provided Tax Service Fees

Panel A: Firms without Tax Departments

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
INCENTIVE	0.070***	0.171	-0.255	0.563**	-0.054
	(2.571)	(0.534)	(-1.044)	(1.697)	(-0.582)
SIZE	0.126**	0.288	0.157	0.333	0.099**
	(2.196)	(1.332)	(0.700)	(1.549)	(2.311)
LN_SEGMENTS	0.318**	-0.192	0.223	-0.161	0.260***
	(2.572)	(-0.464)	(0.450)	(-0.408)	(2.632)
ROA	0.200**	-0.170	0.401	-0.189	0.033
	(2.496)	(-0.447)	(0.785)	(-0.531)	(0.624)
BTM	-0.036**	0.062	0.014	0.097	-0.024
	(-2.162)	(0.607)	(0.094)	(0.991)	(-1.496)
FIRM_AGE	-0.039	-0.103	0.173	-0.156	-0.042
	(-0.525)	(-0.413)	(0.740)	(-0.618)	(-0.857)
LEVERAGE	-0.208	-0.070	0.356	-0.243	-0.130
	(-1.425)	(-0.109)	(0.458)	(-0.394)	(-1.220)
PPE	0.012	-0.059	1.174	0.254	-0.010
	(0.042)	(-0.056)	(0.997)	(0.240)	(-0.046)
RD	-0.067	-2.517**	-1.892	-2.765**	0.051
	(-0.202)	(-2.165)	(-0.855)	(-2.301)	(0.257)
INTANG	-0.013	0.613	0.814	0.759	0.039
	(-0.062)	(0.892)	(1.324)	(1.124)	(0.227)
INVENTORY	-1.215***	-1.903	-1.677	-1.846	-0.766**
	(-3.104)	(-1.239)	(-0.891)	(-1.253)	(-2.379)
NOL	0.001	-0.227	-0.204	-0.214	-0.062
	(0.016)	(-1.203)	(-0.918)	(-1.156)	(-1.112)
CHANGE_NOL	-0.013	0.043	0.099	0.035	-0.019

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
	(-0.345)	(0.486)	(0.988)	(0.411)	(-0.740)
FOR_DUMMY	-0.008	0.294	0.216	0.304	0.001
	(-0.103)	(1.325)	(0.845)	(1.414)	(0.011)
FOR_INCOME	0.429	-4.643	-3.825	-3.945	-0.396
	(0.434)	(-1.290)	(-0.874)	(-1.129)	(-0.495)
LN_HAVENS	0.036	0.033	0.121	0.028	0.034
	(0.448)	(0.197)	(0.628)	(0.173)	(0.458)
SGA	0.025	0.232	0.099	0.391	-0.145**
	(0.251)	(0.443)	(0.132)	(0.752)	(-2.307)
TOTAL_FEES	0.449***	0.625**	1.301***	0.633**	0.452***
	(11.236)	(2.308)	(5.351)	(2.412)	(13.386)
Constant	-5.649***	-8.320**	-21.063***	-8.169**	-5.548***
	(-7.200)	(-2.020)	(-5.961)	(-2.057)	(-10.298)
Observations	14,748	1,819	1,259	1,859	21,387
R-squared	0.170	0.244	0.256	0.247	0.171
Other Controls	N/A	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES
Clustered SE	FIRM	FIRM	FIRM	FIRM	FIRM

Note: This table presents the results of estimating Ordinary Least Squares Regressions of the logarithm of the dollar amount of tax service fees paid to the firm's auditor on a set of tax avoidance incentives, estimated for firms without tax departments. All variables are calculated as described in Appendix A. Robust standard errors are clustered by firm. T-statistics are presented in parentheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 7: The Relationship Between Tax Avoidance Incentives and Auditor-Provided Tax Service Fees

Panel B: Firms with Tax Departments

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
INCENTIVE	-0.071**	0.005	0.036	-0.025	0.000
	(-1.781)	(0.091)	(0.378)	(-0.217)	(0.007)
SIZE	-0.115*	0.005	0.069	0.014	0.024
	(-1.788)	(0.056)	(0.750)	(0.168)	(0.411)
LN_SEGMENTS	-0.095	-0.038	0.088	-0.040	-0.004
	(-0.978)	(-0.312)	(0.666)	(-0.326)	(-0.039)
ROA	0.105	0.256	0.319	0.227	-0.027
	(0.806)	(1.185)	(1.311)	(1.049)	(-0.238)
BTM	0.052**	0.034	0.025	0.033	0.022
	(2.195)	(0.849)	(0.550)	(0.839)	(0.936)
FIRM_AGE	-0.114***	-0.029	0.018	-0.025	-0.094***
	(-2.886)	(-0.475)	(0.303)	(-0.410)	(-3.070)
LEVERAGE	0.097	-0.019	-0.059	-0.011	-0.103
	(0.595)	(-0.079)	(-0.227)	(-0.046)	(-0.689)
PPE	-0.020	0.532	0.990*	0.659	0.386
	(-0.063)	(1.062)	(1.853)	(1.317)	(1.145)
RD	0.000	0.316	0.624	0.328	0.185
	(0.000)	(0.347)	(0.576)	(0.356)	(0.371)
INTANG	0.401*	0.647**	0.395	0.579*	-0.013
	(1.724)	(2.166)	(1.198)	(1.920)	(-0.063)
INVENTORY	-1.522***	-1.589**	-1.391*	-1.520**	-1.308**
	(-2.680)	(-2.186)	(-1.736)	(-2.076)	(-2.435)
NOL	-0.031	-0.112*	-0.051	-0.126*	-0.019
	(-0.583)	(-1.648)	(-0.703)	(-1.855)	(-0.347)
CHANGE_NOL	-0.162**	-0.070	-0.035	-0.069	-0.077

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
	(-2.463)	(-0.677)	(-0.286)	(-0.671)	(-1.356)
FOR_DUMMY	-0.010	-0.255**	-0.130	-0.218*	-0.088
	(-0.112)	(-2.083)	(-0.910)	(-1.774)	(-1.037)
FOR_INCOME	0.488	0.862	0.216	0.842	1.300*
	(0.649)	(0.912)	(0.217)	(0.891)	(1.779)
LN_HAVENS	0.083**	0.073*	0.088*	0.070*	0.131***
	(2.092)	(1.705)	(1.859)	(1.662)	(3.228)
SGA	-0.080	0.484	0.560	0.491	-0.100
	(-0.404)	(1.513)	(1.588)	(1.549)	(-0.629)
TOTAL_FEES	0.976***	1.100***	1.166***	1.076***	0.987***
	(19.062)	(16.607)	(14.030)	(16.566)	(17.512)
TAXDEPT_SIZE	-0.017	-0.024	-0.008	-0.025	-0.012
	(-0.838)	(-0.753)	(-0.234)	(-0.803)	(-0.689)
Constant	-10.721***	-15.132***	-16.930***	-14.786***	-12.089***
	(-12.995)	(-11.506)	(-11.676)	(-11.511)	(-15.756)
Observations	20,969	14,103	11,211	14,393	22,964
R-squared	0.236	0.304	0.228	0.304	0.252
Other Controls	N/A	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES
Clustered SE	FIRM	FIRM	FIRM	FIRM	FIRM

Note: This table presents the results of estimating Ordinary Least Squares Regressions of the logarithm of the dollar amount of tax service fees paid to the firm's auditor on a set of tax avoidance incentives, estimated for firms with tax departments. All variables are calculated as described in Appendix A. Robust standard errors are clustered by firm. T-statistics are presented in parentheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

TABLE 8: The Relationship Between Tax Avoidance Incentives and Tax-Motivated Lobbying

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
INCENTIVE	0.000	0.032***	0.0399***	0.005	0.015***
	(0.119)	(3.777)	(4.058)	(0.275)	(3.222)
SIZE	0.060***	0.115***	0.123***	0.120***	0.045***
	(12.768)	(11.007)	(11.179)	(11.836)	(10.992)
LN_SEGMENTS	0.015*	0.026*	0.024	0.025*	0.013**
	(1.869)	(1.840)	(1.529)	(1.782)	(2.044)
ROA	-0.046***	-0.107***	-0.104***	-0.106***	-0.016***
	(-6.254)	(-3.878)	(-3.121)	(-3.886)	(-3.487)
BTM	-0.003*	-0.012*	-0.014	-0.013**	-0.004***
	(-1.820)	(-1.685)	(-1.568)	(-1.969)	(-3.170)
FIRM_AGE	0.002***	0.001*	0.001	0.001*	0.000*
	(6.208)	(1.919)	(1.372)	(1.902)	(1.826)
LEVERAGE	-0.025**	-0.089***	-0.096***	-0.094***	-0.013
	(-2.209)	(-2.915)	(-2.965)	(-3.110)	(-1.415)
PPE	-0.015	-0.021	-0.038	-0.023	-0.027*
	(-0.748)	(-0.438)	(-0.704)	(-0.487)	(-1.774)
RD	-0.003	0.062	0.139	0.076	-0.007
	(-0.137)	(0.680)	(1.334)	(0.838)	(-0.441)
INTANG	-0.093***	-0.225***	-0.232***	-0.230***	-0.069***
	(-5.081)	(-5.905)	(-5.730)	(-6.047)	(-4.794)
INVENTORY	-0.033	-0.152***	-0.183***	-0.160***	-0.052***
	(-1.409)	(-2.642)	(-2.923)	(-2.813)	(-2.861)
NOL	-0.011*	-0.018	-0.017	-0.018	0.002
	(-1.908)	(-1.632)	(-1.483)	(-1.633)	(0.467)
CHANGE_NOL	0.002	0.009	0.020*	0.011	0.001
	(0.798)	(0.919)	(1.828)	(1.127)	(0.832)
FOR_DUMMY	-0.030***	-0.015	-0.011	-0.015	-0.021***

TABLE 8 (Continued)

INCENTIVE =	(1) Financial Constraints	(2) CEO Vega	(3) CFO Vega	(4) Hedge Fund	(5) CF Forecasts
	(-4.598)	(-1.022)	(-0.669)	(-1.046)	(-4.283)
FOR_INCOME	0.224**	0.005	0.069	0.019	0.105
	(2.081)	(0.031)	(0.416)	(0.118)	(1.156)
LN_HAVENS	0.015***	-0.011	-0.011	-0.010	0.013***
	(2.685)	(-1.563)	(-1.444)	(-1.445)	(2.667)
TAX_FEES	0.004***	0.003	0.002	0.003*	0.002***
	(3.360)	(1.508)	(0.883)	(1.689)	(2.691)
LN_EMPLOYEES	-0.003	0.009	0.007	0.008	-0.000
	(-0.664)	(0.885)	(0.696)	(0.800)	(-0.106)
SGA	0.032***	0.070***	0.075***	0.074***	0.016***
	(4.205)	(2.639)	(2.707)	(2.812)	(3.456)
Constant	-0.323***	-0.538***	-0.591***	-0.656***	-0.233***
	(-5.087)	(-3.660)	(-3.686)	(-4.915)	(-7.677)
Observations	35,538	15,907	12,460	16,236	43,797
R-squared	0.238	0.340	0.347	0.337	0.152
Controls	YES	YES	YES	YES	YES
Industry FEs	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES
Clustered SE	FIRM	FIRM	FIRM	FIRM	FIRM

Note: This table presents the results of estimating a linear probability model of the probability of tax-motivated lobbying on a set of tax avoidance incentives. All variables are calculated as described in Appendix A. Robust standard errors are clustered by firm. T-statistics are presented in parentheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

Panel A: Financial Constraints

INCENTIVE =	Altman's Z-Score		KZ Index		WW Index	
	(1)	(2)	(3)	(4)	(5)	(6)
Subsample	Non Tax Avoiders	Tax Avoiders	Non Tax Avoiders	Tax Avoiders	Non Tax Avoiders	Tax Avoiders
INCENTIVE	0.037*	0.044**	0.054***	0.027**	0.011	0.094**
	(1.410)	(1.911)	(2.766)	(1.788)	(0.279)	(2.336)
Observations	18,476	18,764	19,493	19,658	20,600	20,607
R-squared	0.110	0.088	0.098	0.097	0.086	0.110
Controls & FEs	YES	YES	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM	FIRM	FIRM

INCENTIVE =	Textual Measure		Combined Index	
	(1)	(2)	(3)	(4)
Subsample	Non Tax Avoiders	Tax Avoiders	Non Tax Avoiders	Tax Avoiders
INCENTIVE	0.007	0.019*	0.029	0.075***
	(0.596)	(1.591)	(1.254)	(3.694)
Observations	16,735	16,743	14,083	14,287
R-squared	0.093	0.088	0.075	0.116
Controls & FEs	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM

TABLE 9: Differential Effects Between Tax Avoiders and non-Tax Avoiders

Panel B: Equity Risk Incentives

INCENTIVE =	CEO Vega		CFO Vega	
	(1)	(2)	(3)	(4)
Subsample	Non Tax Avoiders	Tax Avoiders	Non Tax Avoiders	Tax Avoiders
INCENTIVE	0.029*	0.048**	-0.016	0.093***
	(1.735)	(2.250)	(-0.969)	(3.178)
Observations	7,808	7,767	5,972	6,015
R-squared	0.162	0.169	0.163	0.173
Controls & FEs	YES	YES	YES	YES
Clustering	FIRM	FIRM	FIRM	FIRM

Panel C: Hedge Fund Intervention

Treatment Group =	(1) Non Tax Avoiders After Intervention	(2) Tax Avoiders After Intervention
INCENTIVE	0.081	0.143**
	(1.062)	(1.806)
Observations	16,617	16,617
R-squared	0.160	0.161
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

TABLE 9: Differential Effects Between Tax Avoiders and non-Tax Avoiders

Panel D: Analyst Cash Flow Forecast

Treatment Group =	(1) Non Tax Avoiders After Forecast	(2) Tax Avoiders After Forecast
INCENTIVE	0.032	0.152***
	(0.813)	(3.591)
Observations	40,073	40,073
R-squared	0.069	0.070
Controls & FEs	YES	YES
Clustering	FIRM	FIRM

Note: These tables present the results of estimating OLS Regressions of tax department size (scaled by number of employees) on a set of tax avoidance incentives, where analyses are conducted separately on two equal-sized subsamples of tax avoiders and non tax avoiders. Each firm is categorized into one of the two groups based on the sensitivity of the firm's cash effective tax rates (Cash ETR) to changes in the incentives (computed using simple correlations or comparisons of Cash ETR pre- and post- treatment). All variables are calculated as described in Appendix A. Variables are winsorized at the 1st and 99th percentiles. Standard errors are robust and clustered by firm. T-statistics are presented in parantheses. *, **, and *** denote one-tailed (two-tailed) statistical significance at 10%, 5%, and 1%, respectively, when a prediction is (not) made.

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