Does tax regulation reduce uncertainty? Evidence from Transfer Pricing Regulations

Katie Daugherty
Indiana University
daugherk@iu.edu

Bridget Stomberg
Indiana University
bstomber@iu.edu

Brian Williams
Texas A&M University
bwilliams@mays.tamu.edu

January 2024

Preliminary – please do not cite or distribute without author permission.

Abstract: We investigate whether tax regulation guidance reduces tax uncertainty. Tax uncertainty can be costly to firms and hinder investment in tax planning. Treasury Regulations are an important part of the tax system, intended to provide taxpayers with guidance about the interpretation and application of the law. However, there is a lack of empirical evidence demonstrating that the regulations are useful in resolving firms' uncertainty. We exploit time-series changes in the directive words contained in Treasury Regulations relating to Internal Revenue Code Section 482 to measure tax regulation. We then estimate how reserves for uncertain tax positions are associated with this guidance. We also explore how tax regulation guidance is associated with investments in foreign tax planning, of which transfer pricing is a critical component. Results suggest tax regulation guidance is associated with less tax uncertainty as measured by tax contingency reserves. We also find evidence that tax regulation guidance is associated with greater investments in foreign tax planning.

Keywords: tax regulation, tax uncertainty, tax planning

I.   Introduction

We investigate whether tax regulation guidance reduces tax uncertainty. Tax uncertainty often arises from "gray areas" in the law that make it unclear what the ultimate outcome of a tax position would be if audited by the tax authority. The primary purpose of tax regulation is to clarify the law when the Internal Revenue Code (IRC) is ambiguous or incomplete. Tax regulations provide guidance to taxpayers and the IRS on proper application of the law. If tax regulations serve their intended purpose of clarifying the law, they should lead to less tax uncertainty. However, there is no empirical evidence demonstrating this association. Our study provides some of the first empirical analysis on the relation between tax regulation guidance and tax uncertainty, and as such, takes a first step at enhancing the understanding of how tax regulation affects corporate taxpayer behavior.

Tax uncertainty can be costly to firms for multiple reasons. First, tax uncertainty can impose financial reporting costs in the form of increased tax expense and reduced net income. ASC 740, *Income Taxes*, requires companies to assess their uncertain tax positions and recognize only the portion of the benefit claimed that is "more-likely-than-not" to be retained upon audit. Thus, all else equal, uncertain tax positions can generate lower financial statement tax benefits. Second, tax uncertainty prompts firms to hold precautionary cash (Hanlon, Maydew, and Saavedra 2017), which is less valuable to the firm because it cannot be used for investment. Similarly, tax uncertainty may cause a company to forgo tax planning, as this uncertainty decreases the non-tax benefits a firm obtains from tax planning (Guenther, Njoroge, and Williams 2020).

Tax uncertainty can also impose costs on the income tax audit process – both to firms and to the tax authority. If there is less certainty about how an area of the tax law should be applied,

tax agents and taxpayers will struggle to reach a consensus about proposed audit adjustments, which can lead to longer and costlier audits (Seidman, Sinha, and Stomberg 2022). Tax authorities therefore also have an incentive to reduce tax uncertainty for taxpayers and tax agents by clarifying the tax law whenever possible.

After Congress enacts tax laws, the Treasury is tasked with interpreting the law and writing Treasury Regulations to provide guidance and enhance clarity.[1] This process is continuous; even after the initial issuance of regulations, the Treasury can update the regulations at any time to further clarify the law. The text of the regulations therefore varies over time, even when there are no changes to the IRC. Revisions to Treasury Regulations are often prompted to correct errors, provide clarification deemed necessary based on Treasury observation, and reflect changes in legal opinions from court case decisions. Snyder (2018) finds that investors value tax regulation guidance after the adoption of ASC 740-10 ("FIN 48"), which mandates disclosures related to uncertain tax positions. His findings are consistent with investors perceiving tax regulation as reducing uncertainty.

We explore the relation between treasury regulation updates and tax uncertainty. We expect updated tax regulations provide enhanced guidance to taxpayers that reduces uncertainty. This expectation assumes that (1) managers or external advisors use regulatory guidance in assessing the uncertainty of various tax positions (rather than relying solely on statutory or judicial law) and (2) that regulatory updates provide new information that is useful to taxpayers in assessing likely outcomes of tax positions. Thus, if either assumption does not hold, we would not find evidence that tax regulation reduces uncertainty.

---

[1] Throughout the paper, we use the terms 'Treasury Regulations' and 'tax regulations' interchangeably.

To measure the extent to which updated tax regulations enhance guidance, we utilize time-series variation in the Treasury Regulations regarding IRC Section 482 (Treas. Reg. §1.482), which relates to transfer pricing. We focus on these tax regulatory updates because transfer pricing is a significant source of tax uncertainty for US multinational taxpayers (Towery 2017), and thus allows us a powerful setting to test the effect of tax regulation on tax uncertainty and corporate taxpayer behavior. We utilize data from the Mercatus Center to obtain the text of the IRC Section 482 regulations over time. We proxy for guidance provided in the regulations by measuring the directive words within the text of these regulations each year. We define directive words as *shall, must, may not, required*, and *prohibited* and use this word list because these words are unambiguous and prescriptive. We expect that guidance through regulation is most useful in resolving uncertainty when it is more directive and that the use of these words will be associated with more directive guidance. This word list has also been used in other research that utilizes regulatory text (Wu 2020, Fan and Wu 2022). We use the annual count, as well as the proportion, of directive words in the regulations as proxies for tax regulation guidance.

We identify firms that are likely subject to the regulations by utilizing data from effective tax rate (ETR) reconciliations in companies' income tax footnotes, compiled by Schwab, Stomberg, and Xia (2022). In the ETR reconciliation, companies disclose material differences between the statutory tax rate and their effective tax rate. We consider firms that report ETR reconciling items that Schwab et al. (2022) classify as related to foreign operations to be potentially subject to the IRC Section 482 regulations.[2] We expect that tax regulation guidance

---

[2] Schwab et al. (2022) explain that the ETR reconciliation items they classify as "Foreign" include benefits from differences between the statutory tax rates in the U.S. and foreign jurisdictions. All else equal, allocating more income to low-tax jurisdictions through strategic transfer pricing will increase the amount of foreign benefit companies report in the ETR reconciliations. The reconciling items do not, however, capture benefits in situations where companies have not asserted indefinite reinvestment under APB 23. Thus, to the extent a company has accrued taxes for incremental U.S. taxes on all of its foreign earnings, we may not identify them as a firm subject to the IRC Section 482 regulations.

regarding transfer pricing will be most relevant for those firms with foreign operations that are meaningfully impacting their effective rate.

We then examine the association between our measure of regulatory guidance and uncertain tax positions. ASC 740 formalizes a method for publicly traded firms to recognize and report these tax reserves beginning in 2007. For each tax position that a firm takes, management must assess what portion of the benefit they believe is *not* more than 50 percent likely to be sustained on audit by the tax authority and record a reserve for that portion. Thus, these reserves reflect tax benefits claimed on tax returns that are not recognized in the company's income tax provision. By definition, these unrecognized tax benefits (UTBs) capture uncertainty about future tax outcomes. We expect tax regulation guidance to be negatively associated with UTBs, holding the level of tax planning constant. However, UTBs are subject to significant managerial discretion and financial reporting incentives (De Simone, Robinson, and Stomberg 2014; Towery 2017; Hanlon and Heitzman 2010). If this discretion makes the relation between tax uncertainty and UTBs less direct, then we may not observe an association between UTBs and tax regulation guidance.

We next examine whether tax regulation guidance is associated with the incidence and magnitude of disclosed foreign tax planning. We identify investments in tax planning through foreign operations by utilizing the effective tax rate reconciliation data (Schwab et al. 2022). Material tax planning through foreign operations attributable to tax rate differences across jurisdictions is reflected in these data. We expect tax regulation guidance to reduce uncertainty about the expected future cash flows that a company can obtain from strategic transfer pricing and, therefore, increase investments in foreign tax planning. However, even if tax regulation guidance decreases uncertainty, the regulations could simultaneously impose more restriction on

firms' ability to benefit from the tax planning strategy. If this is the case, a reduction in uncertainty through regulatory guidance may not lead to an increase in investment in tax planning.

We examine the association between tax regulation guidance and tax uncertainty using a sample of observations from 2007 through 2016. We find that tax regulation guidance is associated with lower ending balances in reserves for uncertain tax positions as well as smaller current-year additions to the reserve balances. We estimate that a one standard deviation increase in directive words is associated with reserve balances that are 19 percent lower than the sample mean. We obtain these results using a sample of firms likely subject to the IRC Section 482 regulations and using the number of directive words in the Regulations. We continue to find consistent results using a difference-in-difference design that evaluates the incremental effect of tax regulation guidance for firms likely subject to the IRC Section 482 regulations relative to firms that are not. We also find evidence that tax regulation guidance is associated with investments in foreign tax planning measured using either the incidence or the magnitude of favorable foreign ETR rate reconciling items. In our final set of analyses, we investigate tax authority monitoring, and find some evidence that guidance is associated with a decrease in tax authority monitoring, suggesting that increased guidance allows the tax authority to use fewer resources on monitoring those firms most affected by the guidance.

Our study makes two contributions. First, we contribute to tax policy research by focusing on how Treasury Regulations affect companies' behavior. Much of the tax policy research in accounting has centered on how legislative authority (i.e., laws passed by Congress) affects firms. However, administrative authority (i.e., regulations issued by the Treasury) is a crucial component of tax policy that has been underexplored by accounting research. Tax

regulations are centrally important in tax planning and compliance, financial reporting for tax, and tax enforcement because they provide legally binding guidance to taxpayers and the IRS, yet we know little about how they affect corporate taxpayers. This lack of research may be because of the difficulty in using the text of the regulations in quantitative analysis. Our study takes an initial step at filling this void by utilizing the text of the tax regulations. We add new empirical evidence on tax regulations generally and on firms' use of tax regulations.

Second, our study informs regulators about the usefulness of tax regulation and how firms respond to tax regulation. The tax regulations are vast. Although the Internal Revenue Code is approximately 2.4 million words long, the tax regulations are nearly three times longer, at approximately 7.7 million words (Greenberg 2015). Regulators expend significant resources to issue regulations and taxpayers may likewise expend resources to understand them. Thus, it is important to provide evidence on the extent to which regulations are useful in providing guidance to taxpayers. Additionally, tax policy is a powerful tool used by the government to influence behavior and shape the economy, so it is important to understand how firms respond to tax regulation for regulators to design policies that meet their objectives.

II.   Background and Hypothesis Development

U.S. Tax Authority

U.S. tax laws are passed by Congress and are codified in the Internal Revenue Code (IRC), which is found in Title 26 of the United States Code (26 USC). The Department of the Treasury is the executive agency tasked with administering and enforcing these tax laws. Issuing Treasury Regulations is a component of Treasury's administrative function. Regulations can be proposed, temporary, or final.[3] Regulations are first issued in proposed form to allow for public

---

[3] Because our research setting focuses on subsequent updates of existing regulations, we use temporary and final regulations and exclude proposed regulations.

comment before they are finalized. When immediate guidance is needed, the Treasury can issue temporary regulations, which are effective immediately but expire within three years if not replaced by final regulations. Both temporary and final regulations are legally binding. Temporary and final regulations are codified in Title 26 of the Code of Federal Regulations (26 CFR) and serve as the official interpretation of the IRC to taxpayers and the Internal Revenue Service (IRS). Within Title 26 of the CFR, the tax regulations are further subdivided by subchapter, part, subpart, and sections. Because the regulations are intended to interpret the IRC, the number of each regulation section corresponds to the number of the related code section.[4] For example, IRC §482 covers transfer pricing and Treas. Reg. §1.482 is the corresponding regulation section.

The Treasury and the IRS also issue other forms of interpretative guidance regarding tax laws; however, regulations are the highest source of authority issued by the Treasury and are second only to the IRC in the hierarchy of tax authority. Treasury Regulations also change more frequently than the IRC. Marino and Watson (2023) note that 760 documents related to issuing or changing Treasury Regulations were published in the Federal Registrar in 2021.[5] Updates may be made for various reasons, including technical correction for errors, additional clarification deemed necessary based on Treasury observation, and changes in legal opinions due to decisions in the judicial system.

Hypothesis Development

Tax uncertainty exists when a company cannot determine what the outcome of a tax position will be if audited by the tax authority. At the time of claiming a tax benefit on the tax

---

[4] We focus on measuring Treasury Regulations at the section level because individual sections typically fully cover distinct rules.

[5] The Federal Registrar publishes all news of issuance or changes to federal regulations.

return, the company may not know whether or to what extent it will retain the benefits claimed upon audit. This uncertainty arises because of "gray areas" in the law (Mills, Robinson, and Sansing 2010). For tax regulations to resolve tax uncertainty, they must provide new information about the interpretation or application of the law and firms must utilize the regulations in assessing the uncertainty of tax positions.

With respect to the informational content of the regulations, prior research shows stock market reactions to the issuance of Treasury Regulations. (Marino and Watson 2023; Snyder 2018). Marino and Watson (2023) and Snyder (2018) both find that the market prices tax regulation and they propose a reduction in tax uncertainty as the economic channel. Marino and Watson (2023) examines reactions to the set of regulations related to the global intangible low-taxed income (GILTI) provisions that were issued for the first time after GILTI was introduced in the 2017 Tax Cuts and Jobs Act (TCJA). Snyder (2018) examines reactions to a wider variety of Treasury regulatory events related to the R&D credit, transfer, pricing, the domestic production activities deduction, fixed asset capitalization, and trade or business deductions. Specifically, he uses a sample of events including Requests for Comment, Advanced Notices of Proposed Rulemaking, Proposed Regulations, Temporary Regulations, and Final Regulations. The findings of market reactions in both papers suggests the market perceives there to be relevant information in newly issued regulations and subsequent updates to the regulations. We contribute to this line of research by testing whether tax regulation updates reduce uncertainty to the firm.

Additionally, changes to regulations may provide information about the application of a law. For example, a regulation may be updated to clarify something in the law that was recently decided in the court system. The interpretation of the law in the court case may be known to firms before the regulations are updated to reflect the decision. However, including the change in

the regulations makes the interpretation legally binding on all taxpayers. In contrast, a court's interpretation is binding only on taxpayers within the court's jurisdiction. Inclusion in the regulations therefore provides new information about the application of the law to the firm that the firm can use to update its expectations about possible outcomes.

With respect to firms' use of tax regulations, tax regulations are intended to provide guidance that should resolve uncertainty, making them an important resource for firms. Firms have incentives to resolve costly tax uncertainty. For financial reporting purposes, tax uncertainty can prevent tax savings from being fully recognized in net income. When a company records a reserve for uncertain tax positions, GAAP tax expense is higher than it would be absent the reserve and, therefore, financial net income is lower. Additionally, tax uncertainty induces firms to have greater precautionary cash holdings to have cash available in the event of an unfavorable tax settlement (Hanlon et al. 2017). This additional cash holding is costly because retained cash provides less value to shareholders and previous research has found precautionary cash to be associated with delaying capital investment (Jacob, Wentland, and Wentland 2020). Further, interview evidence in Seidman, Sinha, and Stomberg (2022) suggests that tax executives are generally concerned with the significant costs associated with an IRS audit and that they act in anticipation of an audit to make the process more efficient. Because the regulations serve as the interpretation of the tax law to the IRS as well as the firm, it is in a firm's best interest to utilize and understand the relevant tax regulations when assessing tax positions in anticipation of interaction with the IRS. We expect that the tax regulations provide information and that firms utilize tax regulations with the intention of reducing uncertainty.[6]

---

[6] We are agnostic as to whether the firm is using external advisors (e.g., accounting firms or law firms) to assist in interpretation and application of the law. In this scenario, these advisors are extensions of the firms and must still utilize the regulations as they relate to the client's tax environment.

Tax Regulation and Tax Reserves

The FASB enacted *Financial Interpretation No. 48 Uncertainty in Income Taxes* ("FIN 48", now codified as ASC 740-10) in 2006 to standardize the measurement and recognition of reserves for uncertain tax positions. Prior to FIN 48, there were no rules that specifically addressed accounting for uncertain tax positions. FIN 48 requires publicly traded companies to assess their tax positions and evaluate whether the positions are "more-likely-than-not" to be sustained upon audit by the tax authority based on technical merit. If the position or any portion of the benefits do not meet this threshold, firms record a financial statement reserve. In making this assessment, firms must assume all tax positions will be audited and are not allowed to incorporate the likelihood of audit. This assessment must be made annually for current year and prior year tax positions.

If a firm has an uncertain tax position and additional tax regulation guidance resolves some uncertainty about the possible outcomes of the position, the reserve that a firm accrues related to that position should decrease, on average. We expect this result whether the content of the tax regulation update is favorable or unfavorable to a specific firm's tax planning. If the resolution of uncertainty is favorable to the firm, the distribution of possible outcomes of the tax position shifts positively, which should allow the firm to reserve less. If the resolution of uncertainty is unfavorable to the firm and the distribution of the possible outcomes of the tax position shifts negatively, we expect firms would likely respond by adjusting their tax planning to avoid newly expected losses on the position. In this case, the changes in tax planning would also cause firms to reserve less. However, there are reasons that additional guidance in the tax regulations may not lead to lower reserves. First, the assessment of whether a reserve should be recorded is subject to significant management discretion. De Simone et al. (2014) examines a

specific setting where the tax law is unclear and finds evidence that firms' decisions in recording

reserves varied drastically. Second, because UTBs are a financial accounting accrual, they are

subject to financial reporting incentives of managers (Hanlon and Heitzman 2010). Accruing a

tax reserve does not allow the entire related tax savings to be recognized in net income.

However, if the reserve is later released due to a change in management's assessment, GAAP tax

expense decreases, increasing net income. To the extent that managers manage earnings using the

tax reserve, they may prefer to continue reserving for the position to create "cookie jar" reserves

(Cazier, Rego, Tian, and Wilson 2009). Ultimately, if tax uncertainty does not clearly map to

UTB reserves due to manager discretion, reductions in uncertainty may not be reflected by

reductions in the UTB reserves. We therefore state my hypothesis in the null:

> **H1:** *There is no association between tax regulation guidance and reserves for unrecognized tax benefits.*

Tax Regulation and Tax Planning

A reduction in uncertainty through tax regulation guidance is likely to affect tax planning

decisions. Tax planning is an investment decision (Blouin 2014; Donohoe, McGill, and Outslay

2014). Accordingly, Blouin (2014) describes tax planning as an investment where a firm must

evaluate the net present value (NPV) of a project before it invests. The NPV is a function of the

expected cash flows and the project's risk (dispersion of cash flows). Uncertainty regarding the

outcome of a project affects both the expected cash flows and the possible dispersion of cash

flows through a firm's assessment of audit risk and likelihood of sustaining a position upon audit.

A large theoretical and empirical literature examining investment under uncertainty generally

finds greater uncertainty is associated with less investment (for example, Bernanke 1983; Dixit

and Pindyck 1994; Leahy and Whited 1996). If this conclusion holds in tax planning investment

decisions, then greater uncertainty regarding possible outcomes should lead to less investment in that tax planning project, on average.

The relation between uncertainty and tax planning investment can be seen in some existing tax research. Interview evidence in Seidman et al. (2022) suggests that tax executives consider uncertainty in the form of existing support for the position and impose some requirement of the level of certainty needed to implement a position. For example, 77% of interviewees suggested they would only implement a position with strong technical support. Some referenced their benchmark of support needed to take a position as 'more likely than not' (50%) threshold under FIN48, or an even higher 'should' (70%) threshold.[7]

Therefore, it follows that a resolution of uncertainty should narrow the distribution of possible outcomes related to the tax planning project and increase investment. However, there are reasons why a reduction in uncertainty specifically through additional tax regulation guidance may not lead to increases in investment in tax planning. The income tax regulations are the longest and most restrictive of all parts of the U.S. Code of Federal Regulations (McLaughlin, Strosko, and DeJoy 2017). To the extent that increasing tax regulation guidance is imposing more restrictions on taxpayers' ability to benefit from a position, it may limit the returns from investment in tax planning leading to less investment. There is limited empirical evidence on the degree of restrictiveness of tax regulation guidance, therefore we state our hypothesis in the null:

> **H2:** *There is no association between tax regulation guidance and investment in tax planning.*

III.   Methodology

Data and Sample Selection

---

[7] These thresholds reference the likelihood of sustaining a position under audit.

We start by gathering data from multiple sources. We obtain historical annual text of the Treasury Regulations from the Mercatus Center, firm-year financial data from Compustat, and effective tax rate reconciliation data (Schwab et al. 2022).[8] Table 1 describes our sample selection criteria. The sample starts with the full population of Compustat U.S. firms for the years 2007-2016. We begin the sample period in 2007 because it was the first year that FIN 48 was effective. We end the sample period in 2016 because it is the last year the ETR reconciliation data is publicly available. Consistent with prior research, we exclude any non-corporate entities, financial firms and utilities, and loss firms. We further require observations to have data available to compute all control variables. Additionally, we eliminate observations that we cannot match to ETR reconciliation data. These criteria leave a sample 14,687 firm-year observations for tests of investments in tax planning (H2). To construct the sample for tests of tax uncertainty, we further exclude observations that have missing or negative ending UTB balances or current year UTB additions.

For firms to respond to tax regulation guidance, they must be subject to the regulation. To identify firms likely to be subject to the IRC Section 482 regulations, we use the ETR reconciliation data from Schwab et al. (2022). Firms must provide reconciliations that detail the differences between their ETR and the statutory tax rate, but they have discretion in how they describe these rate reconciliation items. Schwab et al. (2022) classifies a sample of firms' ETR reconciliation adjustments into broad groups using key words and hand classification. We use the rate adjustments that Schwab et al. (2022) classify as 'foreign'. Although this group of adjustments likely capture a wide array of foreign tax planning, we expect it to include benefits from tax planning related to transfer pricing. Firms that have ETR reconciliation adjustments

---

[8] ETR reconciliation data are from Junwei Xia's website.

related to foreign tax planning are most likely to be sensitive to changes in the transfer pricing regulations. We identify firm-year observations as likely subject to the regulations (i.e., treated) if they disclose a favorable foreign ETR reconciliation adjustment in year *t* and in year *t-1*. We focus on favorable ETR reconciling items as those reduce the ETR and reflect benefits of tax planning. We consider firms that never disclose a favorable foreign ETR adjustment in the sample period as control observations.

We require treated firms to disclose favorable foreign items in *t*-1 and in *t* in an attempt to hold constant the level of tax planning activity and isolate changes in the UTBs solely due a reduction in uncertainty for an *existing* tax position and not due to changes in the level of tax planning. Therefore, we do not include firm-years in our sample in which a firm begins or stops disclosing a foreign tax benefit, because there would likely be significant changes in UTBs related to this change in tax planning that could confound our results.[9] Eliminating firm-year observations that we cannot classify as treated or control leave a sample of 7,793 firm-year observations for tests of H1.

[Insert Table 1 here.]

Tests of H1

We begin by examining the association between tax regulation guidance and tax uncertainty. First, we estimate the following ordinary least squares (OLS) regression:

$$UTB_{it} = \beta_0 + \beta_1 Regulation\ Guidance_t + \beta_2 CETR_{it} + \beta_3 Size_{it} + \beta_4 Leverage_{it} +$$
$$\beta_5 PTROA_{it} + \beta_6 Intan\ Intensity_{it} + \beta_7 Cap\ Intensity_{it} + \beta_8 Foreign\ Ops_{it} +$$
$$\beta_9 R\&D_{it} + \beta_{10} MTB_{it} + \beta_{11} SG\&A_{it} + \beta_{12} Sales\ Growth_{it} + IndustryFE + \varepsilon_{it} \quad (1)$$

---

[9] For example, if a firm disclosed a favorable foreign tax benefit in year *t*, but not in year *t-1*, year *t* is not considered a treated observation and we exclude it from our sample. If a firm disclosed a favorable foreign tax benefit in year *t-1*, but not in year *t*, year *t* is not considered a control observation and we exclude it from our sample.

We measure tax uncertainty with *UTB*, which is the ending balance of the UTB in year t (*UTB End*) or current-year additions to the UTB (*UTB Add*). Both measures are scaled by beginning of year total assets and multiplied by 100 to ease interpretation. We use current year additions to UTBs, rather than current year decreases related to prior year positions, because changes to tax regulation are generally applied prospectively. Therefore, if tax regulation guidance is issued in the current year, firms typically should not apply this guidance to reduce UTBs related to positions taken in prior years. However, because UTB additions measure uncertain tax positions that are taken in the same year that we measure tax regulation guidance, as regulation guidance increases, we expect firms utilize this guidance and UTB additions would decrease. Although tax regulations are most commonly applied prospectively, the Treasury has the power to retroactively apply changes to regulations that correct errors and Congress can give Treasury authorization to retroactively apply other regulation changes. The retrospective application typically cannot be to a taxpayer's detriment, only to their benefit (Jackson & Campbell 2016).[10] Therefore, we also use ending UTB balances to capture both changes in the reserve related to previous positions and current year positions. However, we acknowledge that ending UTB balances can also reflect in part items that are unrelated to changes in management's uncertainty about the firm's tax positions (i.e., lapses in the statute of limitation, or settlements paid).

Regulation Guidance is our variable of interest. We utilize the text of the transfer pricing regulations to create two measures of *Regulation Guidance* based on the number of directive words in each year. These words are "shall," "must," "may not," "prohibited," and "required." We use these words to represent guidance because they are unambiguous and prescriptive and therefore, sentences in the regulations that include these words are likely less ambiguous. This

---

[10] Identifying the effect date of each individual regulatory update in our sample requires hand collection. We plan to complete this collection in future work to refine the analyses.

word list is also used in prior studies that examine the impact of various regulation on firms (e.g., Wu 2020; Fan and Wu 2022). These words are defined as "restrictive" words by the Mercatus Center's RegData in its measure of total regulatory restrictiveness (Al-Ubaydli and McLaughlin 2017). In the context of tax regulations, we think of these words more broadly as directive words rather than restrictive, where directive is defined as "intended to guide, govern, or influence" (Merriam-Webster). The reason for this is that tax policy is sometimes used as a tool to incentivize certain behavior. In situations where tax law is allowing for a tax benefit, regulations are not necessarily restricting an activity and instead are providing guidance to comply.

We perform our tests using two versions of the directive word count. The first is the is the percent of directive words out of the total words in the IRC Section 482 regulations in year t, multiplied by 100 (*Directive Words%*) and the second is the natural log of the count of directive words in the IRC Section 482 regulations in year t (*Directive Words*). A negative coefficient on *Directive Words* or *Directive Words%* ($\beta_1 < 0$) would indicate lower UTBs as tax regulation guidance increases. Figure 1 presents graphs of the time series of the count and percentage of the directive words over our sample period. [11]

[Insert Figure 1 here.]

We include controls for various firm characteristics (*Size*, *Leverage*, *PTROA*, *MTB*, *SG&A*, and *Sales Growth*), as well as controls for the underlying activities that give rise to tax planning opportunities (*Intan Intensity*, *Cap Intensity*, *Foreign Ops*, and *R&D*). To address the possibility that *Regulation Guidance* also affects the level of tax planning (which we directly test in H2), we also control for the level of tax planning using the cash effective tax rate (*CETR*).

---

[11] There is a significant jump in directive words in 2009. In untabulated analysis, we examine UTBs for treated firms between a pre-period (2007-2008) and a post-period (2009-2011) and find a statistically significant difference. See Appendix B for details on the change in directive words in 2009.

CETR is calculated over three years (*CETR3*) in the *UTB End* specification and one year (*CETR1*) in the *UTB Add* specification. We define all variables in Appendix A. We winsorize *CETR1* and *CETR3* at zero and one. We winsorize all other continuous variables the 1st and 99th percentiles, except for *Directive Words* and *Directive Words%* because these variables take on a single value for each year in the sample. We estimate equation (1) with and without industry fixed effects, defined using 2-digit SIC codes. Our preferred specifications include industry fixed effects because tax planning opportunities tend to vary with industry. For example, Belnap, Kroeger, and Thornock (2023) estimate that industry fixed effects account for 12-13 percent of the total explained variation in common measures of tax planning. We do not include year fixed effects because the variation in *Regulation Guidance* arises from annual differences. We cluster standard errors by firm.

We estimate equation (1) using only the sample of firm-year observations likely subject to the IRC Section 482 regulations. However, we also improve identification by exploiting cross-sectional variation in the extent to which firms should be affected by regulatory guidance in the IRC Section 482 regulations and estimating a difference-in-difference specification using a sample that includes both treated and control firms:

$$
\begin{aligned}
UTB_{it} = \ & \beta_0 + \beta_1 Treat_{it} + \beta_2 Regulation\ Guidance_t + \\
& \beta_3 Treat_{it} xRegulation\ Guidance_t + \beta_4 CETR_{it} + \beta_5 Size_{it} + \beta_6 Leverage_{it} + \\
& \beta_7 PTROA_{it} + \beta_8 Intan\ Intensity_{it} + \beta_9 Cap\ Intensity_{it} + \beta_{10} Foreign\ Ops_{it} + \\
& \beta_{11} R\&D_{it} + \beta_{12} MTB_{it} + \beta_{13} SG\&A_{it} + \beta_{14} Sales\ Growth_{it} + IndustryFE + \varepsilon_{it} \quad (2)
\end{aligned}
$$

Treat is an indicator variable equal to one for firm-year observations in which a firm discloses a favorable foreign tax benefit in its ETR reconciliation in year *t* and *t-1* and zero for firms that never disclose a favorable foreign tax benefit in the sample period. In estimations of this model, we interact *Treat* with all predictive variables, but suppress the notation for brevity.

In equation (2), β_3 is our coefficient of interest. A significant negative coefficient indicates that treated firms decrease their UTBs incrementally more than control firms following increases in *Regulation Guidance*.

Tests of H2

We next examine the association between tax regulation guidance and investment in tax planning using ETR reconciliation data. First, we examine the association between tax regulation guidance and the likelihood of disclosing a favorable ETR rate reconciliation item related to foreign tax planning by estimating the following logistic regression model:

$$Foreign\ Ind_{it} = \beta_0 + \beta_1 Regulation\ Guidance_t + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 PTROA_{it} + \beta_5 Intan\ Intensity_{it} + \beta_6 Cap\ Intensity_{it} + \beta_7 Foreign\ Ops_{it} + \beta_8 R\&D_{it} + \beta_9 MTB_{it} + \beta_{10} SG\&A_{it} + \beta_{11} Sales\ Growth_{it} + IndustryFE + \varepsilon_{it} \qquad (3)$$

where *Foreign Ind* is equal to one when firm *i* discloses a favorable (i.e., ETR decreasing) foreign reconciling item in the ETR reconciliation in the tax footnote on the 10-K in year *t*, and zero otherwise. The classification of foreign reconciliation items is defined by Schwab et al. (2022). A positive β_1 would indicate a greater likelihood of disclosing an ETR reconciliation adjustment as tax regulation guidance increases. We include the same controls as in equation (1) to control for firm characteristics and opportunities for tax planning but exclude the *CETR* because we are examining investment in tax planning in these tests.

Next, we examine the association between tax regulation guidance and the magnitude of benefit of the related rate reconciliation item by estimating the following OLS regression model:

$$Foreign\ Mag_{it} = \beta_0 + \beta_1 Regulation\ Guidance_t + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 PTROA_{it} + \beta_5 Intan\ Intensity_{it} + \beta_6 Cap\ Intensity_{it} + \beta_7 Foreign\ Ops_{it} + \beta_8 R\&D_{it} + \beta_9 MTB_{it} + \beta_{10} SG\&A_{it} + \beta_{11} Sales\ Growth_{it} + IndustryFE + \varepsilon_{it} \qquad (4)$$

where *Foreign Mag* is defined as the magnitude of the ETR reconciliation adjustment classified as foreign by Schwab et al. 2022 for firm *i* in year *t*, multiplied by negative one. Amounts are

given as a percentage of pretax book income. For example, if the statutory tax rate is 35% of pretax book income and a firm's ETR is 32% solely due to favorable foreign items, the magnitude of the benefit would be -0.03. A more negative value indicates a greater tax benefit; therefore, we multiply the ETR reconciliation amount by negative one so that the variables are increasing in the magnitude of the benefit for easier interpretation. A positive β_1 would indicate greater average benefits disclosed in ETR reconciliations as tax regulation guidance increases.

IV.   Results

Descriptive Statistics

Table 2 presents descriptive statistics for variables used in our analyses. Approximately 44.2 percent of observations disclose a favorable foreign tax benefit in their ETR reconciliation. The average magnitude of the foreign reconciling item is 2.9 percent of pretax income. Within the sample used to test H1, 53 percent of firm-year observations are treated, which means they disclose a favorable foreign tax benefit in year *t* and year *t-1*. The mean logged number of directive words in the transfer pricing regulations across the panel is 5.977, equating to a mean total number of directive words of 394 (untabulated). On average, the directive words make up 0.314 percent of the total words in the transfer pricing regulations. The average firm in the sample is large ($882 million in assets, untabulated), profitable (pretax ROA of 11.9 percent), has positive sales growth (9.4 percent) and extensive foreign operations (61.6 percent of observations have foreign operations).

The average value of UTB ending balances is 1.024 percent of total assets and the average value of UTB additions is 0.141 percent of total assets. The average beginning total assets in our sample is approximately $882 million, and therefore average UTB balances and UTB additions equate to $10.6 million and $1.2 million, respectively (untabulated).

[Insert Table 2 here.]

Tests of H1

We present tests of H1 in Tables 3 through 6. Table 3 reports the results of estimating equation (1) using the sample of treated firms with *Directive Words%* as the independent variable. Panel A reports the results using *UTB End* as the dependent variable. Panel B reports the results using *UTB Add* as the dependent variable. Column 1 excludes fixed effects and Column 2 includes industry fixed effects. Across each specification, we find a negative and statistically significant coefficient on *Directive Words%*, indicating that among treated firms, a greater proportion of directive words to total words in the transfer pricing regulations are associated with lower UTB ending balances and current year UTB additions. A one standard deviation increase in *Directive Words%* is associated with ending UTBs and UTB additions that are lower on average by .13% and .02% of total assets, respectively. [12] This difference is approximately 13% of the mean value of *UTB End* and 14% of the mean value of *UTB Add*.

[Insert Table 3 here.]

Table 4 reports the results of estimating equation (2) using the sample of treated and control firms with *Directive Words%* as the independent variable. Panel A reports the results using *UTB End* as the dependent variable. Panel B reports the results using *UTB Add* as the dependent variable. Column 1 excludes fixed effects and Column 2 includes industry fixed effects. Across most specifications, we find a negative and statistically significant coefficient on *Directive Words%* and the interaction of *Directive Words%* and *Treat*. However, the coefficient on the interaction of *Directive Words%* and *Treat* in the specification in the second column of Table 4 Panel B is not statistically significant, using a two-tailed test. Overall, these results

---

[12] These estimates are computed using specifications in column 2 of Table 3. (0.011 * -12.085 = -0.13 and 0.011 * -1.818 = -0.02)

indicate that a greater proportion of directive words to total words is associated with lower levels and additions to UTBs across both control and treated firms, but that UTBs are incrementally lower for treated firms.

[Insert Table 4 here.]

Table 5 reports the results of estimating equation (1) using the sample of treated firms with *Directive Words* as the independent variable. Columns 1 and 2 report the results using *UTB End* as the dependent variable. Columns 3 and 4 report the results using *UTB Add* as the dependent variable. Columns 1 and 3 exclude fixed effects and columns 2 and 4 include industry fixed effects. Across each specification, we find a negative and statistically significant coefficient on *Directive Words*, indicating that among treated firms, greater directive words in the transfer pricing regulations are associated with lower UTB ending balances and current year UTB additions. A one standard deviation increase in *Directive Words* is associated with ending UTBs and UTB additions that are lower on average by .20% and .03% of total assets, respectively. [13] This difference is approximately 19% of the mean value of *UTB End* and 21% of the mean value of *UTB Add*.

[Insert Table 5 here.]

Table 6 reports the results of estimating equation (2) using the sample of treated and control firms with *Directive Words* as the independent variable. Columns 1 and 2 report the results using *UTB End* as the dependent variable. Columns 3 and 4 report the results using *UTB Add* as the dependent variable. Columns 1 and 3 exclude fixed effects and columns 2 and 4 include industry fixed effects. Across each specification, we find a negative and statistically

---

[13] These estimates are computed using specifications in columns 2 and 4 of Table 5. (0.171 * -1.191 = -0.20 and 0.171 * -0.171 = -0.03)

significant coefficient on *Directive Words* and the interaction of *Directive Words* and *Treat*. These results indicate that greater directive words in the regulations are associated with lower levels and additions to UTBs across both control and treated firms, but that UTBs are incrementally lower for treated firms.

[Insert Table 6 here.]

Overall, the results across the tests of H1 are consistent with greater levels or proportions of directive words in the transfer pricing tax regulations having a negative association with UTBs. Our results are consistent with the prediction that updates to tax regulation reduces tax uncertainty, resulting in lower reserves for unrecognized tax benefits. We therefore reject the null hypothesis that there is no association between tax regulation guidance and reserves for unrecognized tax benefits.

Tests of H2

We present tests of H2 in Table 7 and Table 8. Table 7 reports the results of equation (3) and equation (4) using *Directive Words%* as the independent variable. Columns 1 and 2 report the results of equation (3) examining the incidence of disclosure of favorable foreign tax benefits. Columns 3 and 4 report results of equation (4) examining the magnitude of foreign tax benefits. Columns 1 and 3 exclude fixed effects and columns 2 and 4 include industry fixed effects. We find statistically significant positive coefficients on *Directive Words%* across each specification. A one standard deviation increase in *Directive Words%* is associated with an incidence of disclosing the benefit that is on average 9% greater and with a magnitude of the benefit that is greater on average by .3% of pretax income.[14] The increase in the incidence is a

---

[14] These estimates are computed using specifications in columns 2 and 4 of Table 7. (0.011*8.280 = 0.09 and 0.011*0.242= 0.003)

20% increase over the mean incidence in the sample of 44%. The increase in the magnitude is a 10% increase over the mean magnitude in the sample of 2.9%.

[Insert Table 7 here.]

Table 8 reports the results of equation (3) and equation (4) using *Directive Words* as the independent variable. Columns 1 and 2 report the results of equation (3) and columns 3 and 4 report results of equation (4). Columns 1 and 3 exclude fixed effects and columns 2 and 4 include industry fixed effects. We find statistically significant positive coefficients on *Directive Words* across each specification. Consistent with the previous results, a one standard deviation increase in *Directive Words* is associated with an incidence of disclosing the benefit that is 9% greater and with magnitude of the benefit that is greater by .3% of pretax income.[15] The increase in the incidence is a 20% increase over the mean incidence in the sample of 44%. The increase in the magnitude is a 10% increase over the mean magnitude in the sample of 2.9%.

[Insert Table 8 here.]

Overall, the results across the tests of H2 are consistent with greater levels or proportions of directive words in the transfer pricing regulations having a positive association with both the incidence of a favorable foreign tax benefit and the magnitude of the benefit. Our results are consistent with the prediction that updates to tax regulation reduce tax uncertainty, resulting in greater investment in tax planning. We therefore reject the null hypothesis that there is no association between tax regulation guidance and investment in tax planning.

V.   Additional Analysis

In additional analysis, we examine whether increasing tax regulation results in decreased tax authority monitoring. If increasing tax regulation guidance decreases uncertainty, which

---

[15] These estimates are computed using specifications in columns 2 and 4 of Table 8. (0.171*0.545 = 0.09 and 0.171*0.015= 0.003)

results in more agreement about proper tax treatment between taxpayers and the IRS, there should be fewer income tax audits related to the tax position after the change in regulation. To test whether tax regulation guidance is associated with less IRS monitoring, we re-estimate equation (1) using *Tax Monitor$_{it}$* as the dependent variable. We measure IRS monitoring based on the measure of net tax monitoring created in Finley and Stekelberg (2022) that uses decreases to the UTB balance due to settlements with tax authorities or due to lapses in the statute of limitations. The intuition behind the measure is that settlements with tax authorities are positively associated with monitoring, and lapses are negatively associated with monitoring. Therefore, relatively more decreases in the UTB due settlements compared to lapses, would indicate greater monitoring.

We adjust the measure to represent future monitoring, rather than past monitoring. Our calculation of *Tax Monitor$_{it}$* is as follows:

$$Tax\ Monitor = \frac{\sum_{t+1}^{3} TXTUBSETTLE - \sum_{t+1}^{3} TXTUBSOFLIMIT}{TXTUBEND_t} \qquad (5)$$

A greater value of *Tax Monitor* represents greater tax monitoring. The mean value of *Tax Monitor* in our sample is negative, indicating that on average, the decreases in UTBs due to lapses in the statute of limitation is greater than the decreases due to settlements. Negative coefficients of interest in these tests would indicate tax regulation guidance is associated with decreased future tax monitoring.

Table 9 presents the results of these tests. Columns 1 and 2 report the results using *Directive Words%* as the dependent variable and columns 3 and 4 report the results using *Directive Words* as the dependent variable. Columns 1 and 3 exclude fixed effects and columns 2 and 4 include industry fixed effects. In the specifications using *Directive Words*, we find negative and statistically significant coefficients of interest. A one standard deviation increase in *Directive*

24

Words is associated with future monitoring that is lower on average by 3% of the UTB balance. [16]

However, we do not find statistically significant coefficients of interest in the specifications

using *Directive Words%*, using a two-tailed test. Overall, these results suggest that greater

guidance in the form of more tax regulation may serve as a substitute for tax authority

monitoring, resulting in decreased income tax audits.

[Insert Table 9 here.]

VI.   **Conclusion**

In this study, we investigate whether clarified guidance through tax regulation reduces

tax uncertainty. Treasury Regulations are intended to provide taxpayers with crucial guidance

regarding interpretation and application of the law. However, there is a lack of empirical

evidence demonstrating that the regulations are useful in resolving firms' uncertainty. We

specifically examine whether tax regulation guidance leads to lower reserves for uncertain tax

positions and whether tax regulation guidance leads to more investment in tax planning.

We utilize the text of the Treasury Regulations to create a measure of tax regulation guidance,

identifying the use of directive words in the regulation.

Our results suggest that an increase in tax regulation guidance – in particular, more

directive words, is associated with reduced tax uncertainty. Specifically, we find that both the

count and proportion of directive words in the regulatory guidance is associated with lower

levels of unrecognized tax benefits, as well as fewer new additions to the reserve for

unrecognized tax benefits. Further, our results are strongest in the firms that should be most

affected by the change in regulation. We also investigate the role of tax regulation guidance on

real tax planning decisions and find that increased regulatory guidance is associated with both an

---

[16] This estimate is computed using the specification in column 4 of Table 9. (0.171 * -0.192 = -0.033)

increase in the incidence and the magnitude of tax planning. In our final set of tests, we examine how tax regulatory guidance is associated with tax monitoring. To the extent that guidance reduces uncertainty for firms, it is possible that it will allow the tax authority to expend fewer resources monitoring these firms, as the allowed and prohibited activities are more clearly specified. We find some evidence consistent with this, as we document a negative association between tax regulatory guidance measured by total directive words and tax authority monitoring. Overall, our results suggests that greater tax regulatory guidance reduces tax uncertainty, leads to more investment in tax planning, and allows the tax authority to expend fewer resources monitoring firms.

Our study makes an important contribution to the tax literature, specifically contributing to tax policy research in accounting by focusing on the Treasury Regulation, which has been understudied in previous work. To this point, the total length of Federal Tax Laws and Regulations has dramatically increased over time, as of 2015 the length stands at over 10 million words – however over 75% of this text is related to the *regulations* (7.65 million words)*,* not the internal revenue code itself (2.4 million words) (Greenberg 2015). We document the role of regulatory guidance in reducing tax uncertainty and helping firms make real decisions regarding investments in tax planning. As such, our paper contributes to tax policy makers by providing evidence regarding the usefulness of tax regulatory guidance to firms.

References

Al-Ubaydli, O., and P.A. McLaughlin. 2017. Regdata: A numerical database on industry specific regulations for all united states industries and federal regulations, 1997–2012. *Regulation & Governan*ce 11(1):109–123.

Belnap, A., K. Kroeger, and J. Thornock. 2023. *Explaining Tax Avoidance: Insights from Thirty Years of Research.* Working paper

Bernanke, B. 1983. Irreversibility, uncertainty, and cyclical investment. *The Quarterly Journal of Economics* 98(1): 85–106.

Blouin, J. 2014. Defining and measuring tax planning aggressiveness. *National Tax Journal* 67 (4): 875-899.

Cazier, R., S. Rego, X. Tian, and R. Wilson. 2009. *Early evidence on the determinants of unrecognized tax benefits.* Working paper.

De Simone, L., J. R. Robinson, and B. Stomberg. 2014. Distilling the reserve for uncertain tax positions: The revealing case of Black Liquor. *Review of Accounting Studies* 19 (1): 456–472.

Dixit, A. and R. Pindyck (1994). *Investment under uncertainty*. Princeton: Princeton University Press.

Donohoe, M., G. McGill, and E. Outslay. 2014. Risky business: The prosopography of corporate tax planning. *National Tax Journal* 67 (4): 851-874.

Financial Accounting Standards Board (FASB). 2006. *Accounting for Uncertainty in Income Taxes*. FASB Interpretation No. 48. Norwalk, CT: FASB.

Fan, G., and X. Wu. 2022. *Going Green: The Governance Role of Environmental Regulations on Firm Innovation and Value*. Working paper.

Graham, J., M. Hanlon, T. Shevlin, and N. Shroff. 2014. Incentives for tax planning and avoidance: Evidence from the field. *The Accounting Review* 89 (3): 991–1023.

Greenberg, S. 2015. Federal Tax Laws and Regulations are Now Over 10 Millon Words Long. *Tax Foundation.* Available at https://taxfoundation.org/blog/federal-tax-laws-and-regulations-are-now-over-10-million-words-long

Hanlon, M., and S. Heitzman. 2010. A review of tax research. *Journal of Accounting and Economics* 50 (2/3): 127–178.

Hanlon, M., E. Maydew, and D. Saavedra. 2017. The taxman cometh: Does tax uncertainty affect corporate cash holdings? *Review of Accounting Studies* 22 (3): 1198–1228.

Jackson & Campbell. 2016. "Retroactive Treasury Regulations?" *Jackson & Campbell*. Available at https://www.jackscamp.com/all-resources/retroactive-treasury-regulations/

Jacob, M., K. Wentland, and S. Wentland. 2022. Real Effects of Tax Uncertainty: Evidence from Firm Capital Investments. *Management Science* 68 (6): 4065-4089.

Leahy, J., and T. Whited. 1996. The effect of uncertainty on investment: Some stylized facts. *Journal of Money, Credit and Banking* 28(1): 64–83.

Marino, A., and L. Watson. 2023. *Investor Reactions to Treasury Regulations: The Case of GILTI.* Working paper.

McLaughlin, P., S. Strosko, and A. DeJoy. 2017. *The Unbearable Weight of the IRS*. Arlington, VA: Mercatus Center. Available at https://www.mercatus.org/publications/regulation/unbearable-weight-irs.

Mills, L., M. Erickson, and E. Maydew. 1998. Investments in tax planning. *Journal of the American Taxation Association* 20 (1): 1–20.

Mills, L., L. Robinson, and R. Sansing. 2010. FIN 48 and Tax Compliance. *The Accounting Review* 85 (5): 1721–42.

Schwab, C., B. Stomberg, and J. Xia. 2022. What determines effective tax rates? The relative influence of tax and other factors. *Contemporary Accounting Research* 39 (1): 459-497.

Seidman, J., R. Sinha, and B. Stomberg. 2022. *The Effect of Tax Authorities on Corporate Tax Planning: Insights from Tax Executives*. Working paper.

Snyder, W. 2018. *Investors' Valuation of Tax Certainty: Evidence from Tax Policy Guidance.* Working paper, University of Illinois.

Towery, E. 2017. Unintended consequences of linking tax return disclosures of tax uncertainty to financial reporting for income taxes: Evidence from schedule UTP. *The Accounting Review* 92 (5): 201–226.

Wu, X. 2020. *SEC Regulations and Firms.* Working paper, University of California

Appendix A – Variable Definitions

Dependent variables	
Foreign Ind	Indicator variable equal to one if foreign item in Schwab et al. (2022) is less than zero; zero otherwise
Foreign Mag	Value of foreign ETR rate reconciliation item in Schwab et al. (2022), multiplied by negative one
Tax Monitor	Sum of settlements with tax authorities (*TXTUBSETTLE*) from t+1 to t+3, less the sum of UTB decreases due to statute of limitation expirations (*TXTUBSOFLIMIT*) from t+1 to t+3, scaled by the ending UTB balance (*TXTUBEND*) in year t. *TXTUBSETTLE* and *TXTUBSOFLIMIT* reset to zero when missing. Definition modified from Finley and Stekelberg (2022)
UTB End	Ending UTB balance (*TXTUBEND*) scaled by beginning of year total assets (*AT*), multiplied by 100
UTB Add	Additions UTB from current year positions (TXTUBPOSINC) scaled by beginning of year total assets (*AT*), multiplied by 100
Independent variables	
Directive Words	Natural log of directive word count in the text of Treas. Reg. §1.482
Directive Words%	Directive word count divided by total word count in the text of Treas. Reg. §1.482, multiplied by 100
Treat	Indicator variable equal to one if *Foreign Ind* is equal to one in year t and year t-1 and equal to zero if *Foreign Ind* is equal to zero in all sample years
Control variables	
Cap Intensity	Net property, plant, and equipment (*PPENT*) scaled by beginning of year total assets (*AT*)
CETR1	Cash taxes paid (*TXPD*) divided by pre-tax income (PI) minus special items (SPI)
CETR3	*CETR1* calculated over three-year period
Intan Intensity	Intangible assets (*INTAN*) scaled by beginning of year total assets (*AT*). *INTAN* reset to 0 if missing
Foreign Ops	Indicator variable equal to one if foreign pre-tax income (*PIFO*) is non-zero; zero otherwise
Leverage	Total debt (*DLTT* + *DLC*) scaled by beginning of year total assets (*AT*). *DLTT* and *DLC* reset to zero when missing
MTB	Ratio of the market value of equity (*CSHO* x *PRCC_F*) and common book equity (*CEQ*)
PTROA	Pre-tax income (*PI*) scaled by beginning of year total assets (AT)
R&D	Research and development expense (*XRD*) scaled by beginning of year total assets (*AT*). *XRD* reset to 0 if missing
Sales Growth	Percentage change in sales (*SALE*) from year *t-1* to year *t*
Size	Natural log of one plus beginning total assets (*AT*)
SG&A	Selling, general, and administrative expenses (*XSGA*) scaled by beginning of year total assets (*AT*). *SGA* reset to zero if missing.

Appendix B

Panel A: Comparison of Individual Directive Words in 2008 and 2009
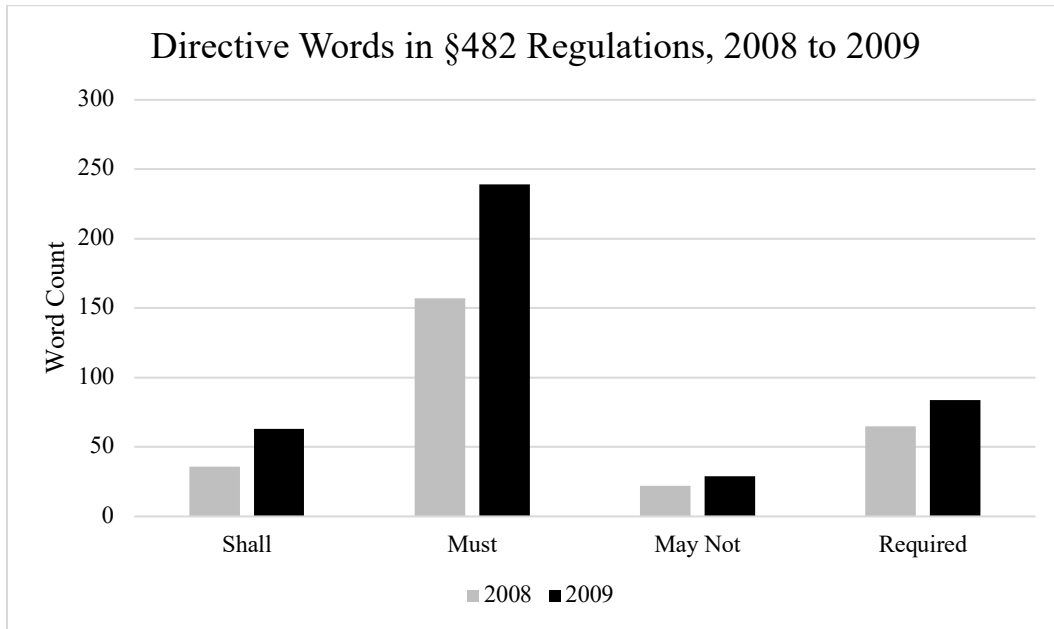
This panel presents a comparison of the counts of each of the directive words *shall*, *must*, *may not*, and *required* used in Treas. Reg. §1.482 for the years 2008 and 2009. The directive word *prohibited* is not used in either of these years, so it is excluded from this panel.

Panel B: Comparison of Total Directive Words in 2008 and 2009
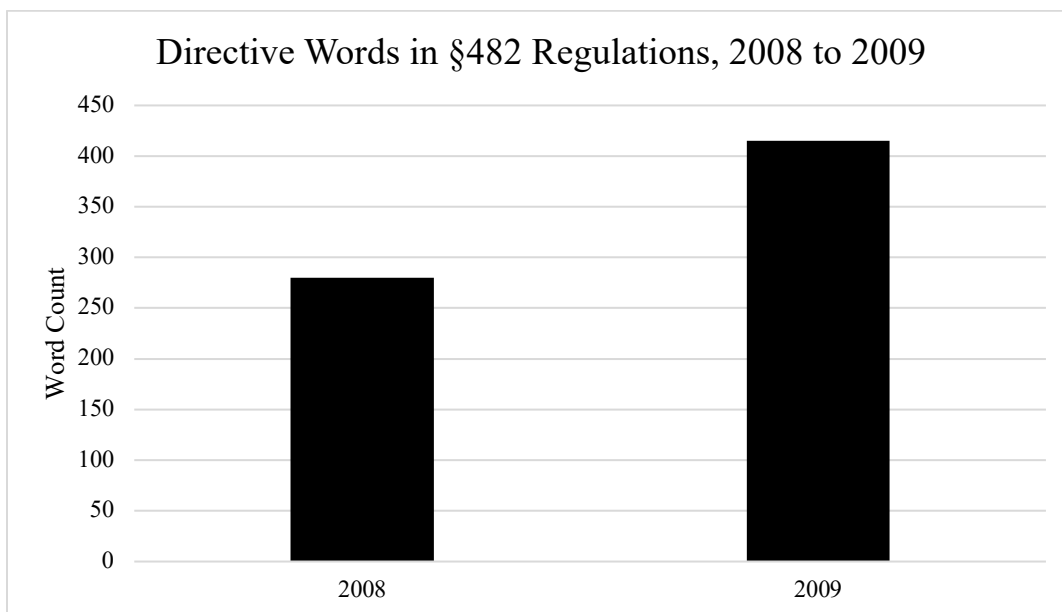
This panel presents a comparison of the counts of the total directive words used in Treas. Reg. §1.482 for the years 2008 and 2009.

Figure 1.

Panel A: Time Series of Directive Words in Regulation Section 482
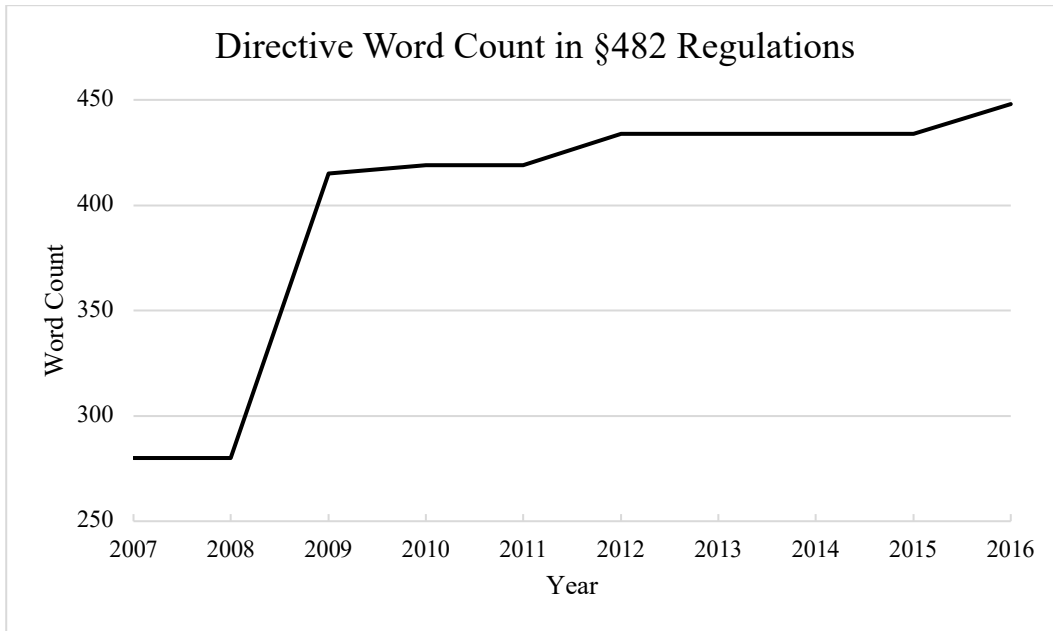
This panel presents a time series plot of the total directive words used in Treas. Reg. §1.482 over the sample period 2007 to 2016.

Panel B: Time Series of Percent of Directive Words in Regulation Section 482
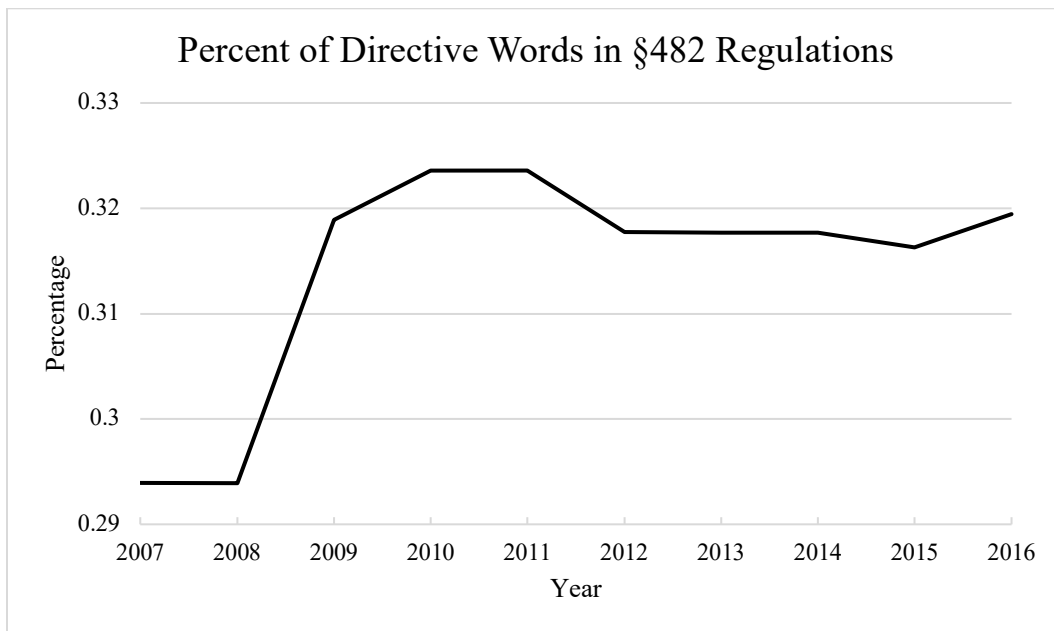
This panel presents a time series plot of the percentage of directive words out of total words used in Treas. Reg. §1.482 over the sample period 2007 to 2016.

Table 1. Sample Selection

Compustat observations for U.S. firms for fiscal years 2007-2016	80,992
Less: Flow-through entities	(6,443)
Less: Financial services firms and utilities	(30,260)
Less: Loss firms	(20,963)
Less: Observations missing data to calculate control variables	(4,008)
Less: Observations without match to Schwab et al. (2022) data	(4,631)
Investment in Tax Planning Sample (H2)	**14,687**
Less: Observations with negative or missing *UTB End* or *UTB Add*	(3,092)
Less: Observations not meeting control or treated definition	(3,802)
UTB Sample (H1)	**7,793**
Treated Observations	**4,199**
Control Observations	**3,594**

Table 1 describes the sample selection process. Flow-through entities are REITs or firms with LP or Trust in the name. Financial services firms are firms with SIC codes in 6000-6999. Utilities are firms with SIC codes in 4900-4999. Loss firms are firms that have an average pretax income (PI-SPI) in the sample period that is less than 0. Firm-year observations are defined as treated observations in year t when the firm has disclosed a favorable foreign tax benefit in the ETR reconciliation in both year t and t-1. Firm-year observations are defined as control observations in year t if the firm never discloses a favorable foreign tax benefit within the sample period.

Table 2. Descriptive Statistics

VARIABLES	(1) N	(2) Mean	(3) SD	(4) P25	(5) P50	(6) P75
Foreign Ind	14,687	0.442	0.497	0.000	0.000	1.000
Foreign Mag	14,687	0.029	0.103	0.000	0.000	0.042
Directive Words	14,687	5.977	0.171	6.028	6.038	6.073
Directive Words%	14,687	0.314	0.011	0.316	0.318	0.319
Cap Intensity	14,687	0.254	0.227	0.087	0.181	0.349
CETR1	14,687	0.246	0.181	0.117	0.237	0.336
CETR3	14,687	0.247	0.164	0.140	0.246	0.330
Intan Intensity	14,687	0.241	0.240	0.034	0.174	0.383
Foreign Ops	14,687	0.616	0.486	0.000	1.000	1.000
Leverage	14,687	0.228	0.231	0.017	0.185	0.345
MTB	14,687	3.008	3.834	1.398	2.218	3.661
PTROA	14,687	0.119	0.095	0.054	0.096	0.154
R&D	14,687	0.028	0.048	0.000	0.000	0.034
Sales Growth	14,687	0.094	0.185	-0.004	0.067	0.159
Size	14,687	6.782	1.876	5.520	6.768	8.036
SG&A	14,687	0.279	0.228	0.116	0.223	0.379
UTB End	7,793	1.024	1.431	0.144	0.522	1.292
UTB Add	7,793	0.141	0.255	0.000	0.042	0.160
Tax Monitor	6,022	-0.011	0.533	-0.274	0.000	0.152
Treat	7,793	0.539	0.499	0.000	1.000	1.000

This table reports descriptive statistics. All continuous variables are winsorized at the 1st and 99th percentiles except for *CETR1* and *CETR3* (which are bounded at 0 and 1), *Directive Words*, and *Directive Words%*. All variables are defined in Appendix A.

Table 3 – Percent of Directive Words and UTBs

Panel A: Percent of Directive Words and the Level of UTBs

VARIABLES	(1) UTB End	(2) UTB End
Directive Words%	-12.889***	-12.085***
	(-4.56)	(-4.44)
CETR3	-1.661***	-1.461***
	(-4.60)	(-4.32)
Size	0.161***	0.201***
	(5.06)	(5.66)
Leverage	0.327	0.546*
	(1.06)	(1.65)
PTROA	2.438***	2.476***
	(2.75)	(2.95)
Intan Intensity	-0.296	-0.648***
	(-1.34)	(-2.61)
Cap Intensity	-0.573*	-0.580
	(-1.94)	(-1.58)
Foreign Ops	0.412***	0.300**
	(3.23)	(2.44)
R&D	9.186***	8.482***
	(7.34)	(6.31)
MTB	-0.014	-0.018
	(-1.11)	(-1.41)
SG&A	0.886***	1.087***
	(2.91)	(3.01)
Sales Growth	0.112	0.142
	(0.47)	(0.58)
Observations	4,199	4,198
R-squared	0.197	0.246
Industry FE	NO	YES

This panel reports regression results from equation (1) using *UTB END* as the dependent variable. Column 1 presents results using no fixed effects and column 2 presents results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A.***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 3 - Percent of Directive Words and UTBs

Panel B: Percent of Directive Words and Additions to UTBs

VARIABLES	(1) UTB Add	(2) UTB Add
Directive Words%	-1.925***	-1.818***
	(-3.49)	(-3.34)
CETR1	-0.126***	-0.100**
	(-2.96)	(-2.38)
Size	0.024***	0.030***
	(4.82)	(5.44)
Leverage	0.062	0.097*
	(1.15)	(1.67)
PTROA	0.853***	0.865***
	(4.82)	(5.04)
Intan Intensity	-0.068*	-0.128***
	(-1.70)	(-2.83)
Cap Intensity	-0.152***	-0.147**
	(-2.99)	(-2.41)
Foreign Ops	0.052**	0.035*
	(2.11)	(1.72)
R&D	1.425***	1.321***
	(6.90)	(5.63)
MTB	-0.001	-0.001
	(-0.30)	(-0.61)
SG&A	0.099	0.099
	(1.63)	(1.26)
Sales Growth	0.058	0.060
	(1.32)	(1.30)
Observations	4,199	4,198
R-squared	0.181	0.213
Industry FE	NO	YES

This panel reports regression results from equation (1) using *UTB ADD* as the dependent variable. Column 1 presents results using no fixed effects and column 2 presents results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 4 - Cross-sectional Differences in the Effect of Percent of Directive Words on UTBs

Panel A: Cross-sectional Differences in the Effect of Percent of Directive Words on the Level of UTBs

VARIABLES	(1) UTB End	(2) UTB End
Treat	1.324	1.369
	(1.07)	(1.17)
Directive Words%	-6.610***	-6.802***
	(-2.72)	(-3.04)
Treat x Directive Words%	-6.278*	-6.040*
	(-1.68)	(-1.71)
CETR3	0.020	-0.012
	(0.09)	(-0.06)
Size	0.049**	0.100***
	(2.49)	(4.31)
Leverage	0.537**	0.575***
	(2.51)	(2.59)
PTROA	0.660*	0.755**
	(1.92)	(2.12)
Intan Intensity	-0.226	-0.547***
	(-1.36)	(-2.83)
Cap Intensity	-0.415**	-0.408**
	(-2.55)	(-2.18)
Foreign Ops	0.216**	0.194*
	(2.18)	(1.88)
R&D	6.725***	6.048***
	(4.46)	(3.72)
MTB	-0.003	-0.010
	(-0.43)	(-1.15)
SG&A	0.256	0.483**
	(1.46)	(2.32)
Sales Growth	-0.313*	-0.220
	(-1.86)	(-1.30)
Observations	7,793	7,793
R-squared	0.218	0.261
Industry FE	NO	YES

This panel reports regression results from equation (2) using *UTB END* as the dependent variable. *Treat* is interacted with each variable in the regression, but coefficients are suppressed for brevity. Column 1 presents results using no fixed effects and column 2 presents results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 4 - Cross-sectional Differences in the Effect of Percent of Directive Words on UTBs

Panel B: Cross-sectional Differences in the Effect of Percent of Directive Words on the Additions to UTBs

VARIABLES	(1) UTB Add	(2) UTB Add
Treat	0.321	0.307
	(1.44)	(1.41)
Directive Words%	-0.773*	-0.833**
	(-1.92)	(-2.10)
Treat x Directive Words%	-1.152*	-1.056
	(-1.69)	(-1.57)
CETR1	0.054**	0.057**
	(2.14)	(2.21)
Size	0.015***	0.022***
	(5.90)	(7.03)
Leverage	0.058**	0.070**
	(2.10)	(2.24)
PTROA	0.206***	0.207***
	(3.08)	(3.08)
Intan Intensity	-0.027	-0.089***
	(-1.24)	(-3.43)
Cap Intensity	-0.026	-0.046*
	(-1.33)	(-1.72)
Foreign Ops	0.024*	0.021
	(1.81)	(1.53)
R&D	1.239***	1.153***
	(5.01)	(4.46)
MTB	0.000	-0.001
	(0.08)	(-0.63)
SG&A	0.084***	0.107***
	(3.36)	(3.60)
Sales Growth	0.025	0.043*
	(1.05)	(1.83)
Observations	7,793	7,793
R-squared	0.208	0.228
Industry FE	NO	YES

This panel reports regression results from equation (2) using *UTB ADD* as the dependent variable. *Treat* is interacted with each variable in the regression, but coefficients are suppressed for brevity. Column 1 presents results using no fixed effects and column 2 presents results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 5 - Directive Words and UTBs

VARIABLES	(1) UTB End	(2) UTB End	(3) UTB Add	(4) UTB Add
Directive Words	-1.244***	-1.191***	-0.177***	-0.171***
	(-6.48)	(-6.39)	(-4.89)	(-4.77)
CETR3	-1.713***	-1.519***		
	(-4.73)	(-4.47)		
CETR1			-0.129***	-0.104**
			(-3.05)	(-2.49)
Size	0.160***	0.199***	0.024***	0.030***
	(5.05)	(5.62)	(4.82)	(5.42)
Leverage	0.374	0.595*	0.069	0.104*
	(1.21)	(1.80)	(1.27)	(1.79)
PTROA	2.417***	2.462***	0.850***	0.862***
	(2.75)	(2.95)	(4.82)	(5.04)
Intan Intensity	-0.286	-0.632**	-0.066*	-0.126***
	(-1.30)	(-2.55)	(-1.68)	(-2.79)
Cap Intensity	-0.597**	-0.596	-0.155***	-0.150**
	(-2.03)	(-1.62)	(-3.06)	(-2.45)
Foreign Ops	0.429***	0.319***	0.054**	0.037*
	(3.40)	(2.61)	(2.21)	(1.85)
R&D	9.168***	8.511***	1.425***	1.327***
	(7.35)	(6.35)	(6.92)	(5.66)
MTB	-0.012	-0.016	-0.000	-0.001
	(-0.96)	(-1.26)	(-0.17)	(-0.47)
SG&A	0.875***	1.052***	0.097	0.094
	(2.88)	(2.90)	(1.60)	(1.19)
Sales Growth	-0.002	0.026	0.042	0.043
	(-0.01)	(0.11)	(0.94)	(0.93)
Observations	4,199	4,198	4,199	4,198
R-squared	0.204	0.253	0.185	0.217
Industry FE	NO	YES	NO	YES

This table reports regression results from equation (1) using *Directive Words* as the independent variable. Columns 1 and 2 use *UTB END* as the dependent variable and columns 3 and 4 use *UTB ADD* as the dependent variable. Columns 1 and 3 present results using no fixed effects and columns 2 and 4 present results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 6 - Cross-sectional Differences in the Effect of Directive Words on UTBs

VARIABLES	(1) UTB End	(2) UTB End	(3) UTB Add	(4) UTB Add
Treat	2.669*	2.648*	0.557**	0.551**
	(1.70)	(1.76)	(2.07)	(2.08)
Directive Words	-0.688***	-0.693***	-0.077***	-0.079***
	(-4.23)	(-4.52)	(-3.08)	(-3.17)
Treat x Directive Words	-0.555**	-0.532**	-0.100**	-0.096**
	(-2.21)	(-2.20)	(-2.28)	(-2.23)
CETR3	-0.013	-0.048		
	(-0.06)	(-0.23)		
CETR1			0.052**	0.055**
			(2.07)	(2.13)
Size	0.049**	0.100***	0.015***	0.022***
	(2.53)	(4.34)	(5.94)	(7.05)
Leverage	0.537**	0.574***	0.058**	0.070**
	(2.52)	(2.59)	(2.10)	(2.25)
PTROA	0.654*	0.757**	0.206***	0.207***
	(1.91)	(2.14)	(3.06)	(3.08)
Intan Intensity	-0.233	-0.543***	-0.028	-0.088***
	(-1.40)	(-2.80)	(-1.27)	(-3.39)
Cap Intensity	-0.432***	-0.415**	-0.027	-0.046*
	(-2.66)	(-2.22)	(-1.42)	(-1.74)
Foreign Ops	0.221**	0.199*	0.025*	0.021
	(2.23)	(1.93)	(1.84)	(1.57)
R&D	6.696***	6.046***	1.237***	1.154***
	(4.43)	(3.71)	(5.00)	(4.46)
MTB	-0.002	-0.008	0.000	-0.001
	(-0.24)	(-0.98)	(0.22)	(-0.50)
SG&A	0.240	0.455**	0.082***	0.104***
	(1.36)	(2.19)	(3.28)	(3.49)
Sales Growth	-0.331*	-0.241	0.023	0.040*
	(-1.96)	(-1.42)	(0.96)	(1.72)
Observations	7,793	7,793	7,793	7,793
R-squared	0.224	0.267	0.211	0.231
Industry FE	NO	YES	NO	YES

This table reports regression results from equation (2) using *Directive Words* as the independent variable. Columns 1 and 2 use *UTB END* as the dependent variable and columns 3 and 4 use *UTB ADD* as the dependent variable. Columns 1 and 3 present results using no fixed effects and columns 2 and 4 present results using industry fixed effects. *Treat* is interacted with each variable in the regression, but coefficients are suppressed for brevity. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 7 - Percent of Directive Words and Tax Planning

VARIABLES	(1) *Foreign Ind*	(2) *Foreign Ind*	(3) *Foreign Mag*	(4) *Foreign Mag*
Directive Words%	6.908***	8.280***	0.241***	0.242***
	(3.40)	(3.93)	(3.34)	(3.34)
Size	0.158***	0.225***	0.005***	0.007***
	(5.73)	(7.66)	(5.31)	(6.80)
Leverage	-0.170	-0.047	-0.012*	-0.009
	(-0.87)	(-0.24)	(-1.77)	(-1.35)
PTROA	0.662	0.776*	-0.021	-0.019
	(1.49)	(1.80)	(-1.38)	(-1.25)
Intan Intensity	0.032	0.235	0.006	0.012
	(0.17)	(1.15)	(0.86)	(1.61)
Cap Intensity	-1.283***	-0.661**	-0.022***	-0.003
	(-5.33)	(-2.33)	(-3.36)	(-0.43)
Foreign Ops	2.565***	2.289***	0.025***	0.016***
	(25.82)	(21.30)	(9.16)	(5.30)
R&D	2.570***	0.076	0.242***	0.148***
	(3.23)	(0.08)	(5.56)	(3.08)
MTB	-0.019**	-0.015*	-0.001**	-0.000
	(-2.42)	(-1.88)	(-2.23)	(-1.58)
SG&A	-0.715***	-0.584**	-0.010	-0.005
	(-3.22)	(-2.31)	(-1.52)	(-0.56)
Sales Growth	0.550***	0.551***	0.025***	0.024***
	(3.63)	(3.55)	(4.16)	(4.03)
Observations	14,687	14,653	14,687	14,687
R-squared			0.057	0.083
Industry FE	NO	YES	NO	YES

This table reports regression results from equations (3) and (4) using *Directive Words%* as the independent variable. Columns 1 and 2 report the results of equation (3) and columns 3 and 4 report the results of equation (4). Columns 1 and 3 present results using no fixed effects and columns 2 and 4 present results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. Z-statistics and T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 8 –Directive Words and Tax Planning

VARIABLES	(1) Foreign Ind	(2) Foreign Ind	(3) Foreign Mag	(4) Foreign Mag
Directive Words	0.450***	0.545***	0.015***	0.015***
	(3.36)	(3.91)	(3.09)	(3.06)
Size	0.158***	0.225***	0.005***	0.007***
	(5.71)	(7.65)	(5.29)	(6.79)
Leverage	-0.180	-0.059	-0.012*	-0.009
	(-0.92)	(-0.30)	(-1.81)	(-1.39)
PTROA	0.668	0.783*	-0.021	-0.019
	(1.50)	(1.82)	(-1.37)	(-1.25)
Intan Intensity	0.030	0.231	0.006	0.012
	(0.15)	(1.13)	(0.85)	(1.60)
Cap Intensity	-1.280***	-0.657**	-0.022***	-0.003
	(-5.31)	(-2.32)	(-3.35)	(-0.42)
Foreign Ops	2.565***	2.289***	0.025***	0.016***
	(25.81)	(21.28)	(9.16)	(5.30)
R&D	2.575***	0.080	0.242***	0.148***
	(3.24)	(0.09)	(5.56)	(3.08)
MTB	-0.020**	-0.016**	-0.001**	-0.000*
	(-2.50)	(-1.98)	(-2.30)	(-1.65)
SG&A	-0.714***	-0.583**	-0.010	-0.005
	(-3.22)	(-2.31)	(-1.52)	(-0.55)
Sales Growth	0.576***	0.582***	0.025***	0.025***
	(3.78)	(3.73)	(4.26)	(4.14)
Observations	14,687	14,653	14,687	14,687
R-squared			0.057	0.083
Industry FE	NO	YES	NO	YES

This table reports regression results from equation (3) and (4) using *Directive Words* as the independent variable. Columns 1 and 2 report the results of equation (3) and columns 3 and 4 report the results of equation (4). Columns 1 and 3 present results using no fixed effects and columns 2 and 4 present results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. Z-statistics and T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.

Table 9 - Directive Words and Tax Monitoring

VARIABLES	(1) Tax Monitor	(2) Tax Monitor	(3) Tax Monitor	(4) Tax Monitor
Directive Words%	-1.469	-1.663		
	(-1.36)	(-1.53)		
Directive Words			-0.179***	-0.192***
			(-2.60)	(-2.73)
CETR3	0.044	-0.001	0.033	-0.014
	(0.44)	(-0.01)	(0.34)	(-0.13)
Size	0.076***	0.073***	0.076***	0.072***
	(8.70)	(7.17)	(8.68)	(7.14)
Leverage	-0.003	-0.095	0.004	-0.086
	(-0.05)	(-1.22)	(0.05)	(-1.11)
PTROA	0.113	-0.038	0.112	-0.039
	(0.71)	(-0.23)	(0.71)	(-0.24)
Intan Intensity	-0.156**	-0.087	-0.153**	-0.083
	(-2.32)	(-1.26)	(-2.28)	(-1.21)
Cap Intensity	-0.018	0.076	-0.020	0.073
	(-0.18)	(0.62)	(-0.21)	(0.60)
Foreign Ops	-0.001	0.041	0.005	0.048
	(-0.02)	(0.78)	(0.08)	(0.90)
R&D	0.192	-0.190	0.189	-0.186
	(0.69)	(-0.61)	(0.68)	(-0.60)
MTB	-0.002	0.000	-0.001	0.001
	(-0.42)	(0.05)	(-0.35)	(0.13)
SG&A	-0.094	-0.028	-0.095	-0.034
	(-1.27)	(-0.30)	(-1.29)	(-0.36)
Sales Growth	0.124	0.123	0.107	0.103
	(1.57)	(1.57)	(1.35)	(1.31)
Observations	3,634	3,632	3,634	3,632
R-squared	0.058	0.096	0.059	0.098
Industry FE	NO	YES	NO	YES

This table reports regression results from equation (1) using *Tax Monitor* as the dependent variable. Columns 1 and 2 use *Directive Words%* as the independent variable and columns 3 and 4 use *Directive Words* as the independent variable. Columns 1 and 3 present results using no fixed effects and columns 2 and 4 present results using industry fixed effects. Industry fixed effects are defined using two-digit SIC codes. T-statistics are reported in parentheses. Standard errors are clustered by firm. All variables are defined in Appendix A. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed p-values.