How Tax Executives Craft Income Tax Disclosures
in Response to Tax-Based Proprietary Costs

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Abstract: We use semi-structured interviews with public company tax executives and archival data to provide new evidence on how tax executives shape the tax footnote in response to their belief that federal, foreign, and state tax authorities use public disclosures in their enforcement efforts. Interviewees express a desire for vague disclosures that nonetheless comply with applicable disclosure mandates. Using a validated measure of "vagueness," we provide corroborating large-sample evidence that tax footnotes are more vague than other footnotes and that tax footnote vagueness is increasing in tax-based proprietary costs. Consistent with some interviewees' belief that vague tax footnotes do not harm investors, we find limited evidence that more vague tax footnotes are associated with higher analysts' tax forecast errors. Our study extends the literature by documenting one way managers alter tax disclosures to reduce tax-based proprietary costs and how this behavior affects stakeholders.

I. INTRODUCTION

Even though tax authorities have access to firms' tax information through private tax return disclosures, they also seek information from public sources when enforcing tax laws (Bozanic, Hoopes, Thornock, and Williams [2017]; Mills and Sansing [2000]; Mills, Robinson, and Sansing [2010]). Thus, managers must balance the costs of publicly disclosing information to tax authorities that could increase the likelihood, length, or tax due after an audit, which we refer to as "tax-based proprietary costs" (Bozanic et al. [2017]; Hope, Ma, and Thomas [2013]), with the potential benefits of publicly disclosing decision-relevant information to investors and analysts (Bhojraj, Blacconiere, and D'Souza [2004]; Hanlon, Hoopes, and Shroff [2014]). We first interview tax executives responsible for their company's tax footnote to better understand how they evaluate these costs and benefits when crafting disclosures.[1] We then conduct large-sample archival analysis to validate and assess the generalizability of interviewees' responses.

Interest in public companies' taxes has grown in recent years. Because corporate tax returns are confidential, external stakeholders other than tax authorities seek information about corporate taxes from public disclosures, including the tax footnote to the financial statements. Financial statement users claim that currently mandated tax footnote disclosures provide insufficient data to assess a firm's tax risk and tax planning opportunities and how these items affect future cash flows (FASB [2023]). In response, the FASB has called for increased transparency in income tax disclosures (FASB [2023]). Nonetheless, firms retain significant control over the content of mandatory income tax disclosures, especially over narrative disclosures that could either enhance or impede financial statement users' comprehension of disclosed amounts. Although transparent disclosures of tax risk and tax planning activities could benefit firms by providing decision-useful

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[1] This study was approved by the Institutional Review Board for Human Participants (IRB) as required by the authors' universities.

information to investors and analysts, these disclosures could be costly if tax authorities use the information to further their enforcement efforts. Even if the disclosure does not result in additional tax assessments, tax authorities' inaccurate processing of disclosed information can be costly to the firm if it leads to unnecessary audits or extends the length of an audit (e.g., Seidman, Sinha, and Stomberg [2022]). The first part of our study leverages interviews with tax executives to further our knowledge of how their belief that tax authorities use public disclosures in their enforcement efforts affects the content of the tax footnote.

We interview tax executives at 27 corporations traded on a U.S. stock exchange. These individuals oversee the tax functions at their companies and have primary responsibility for preparing the tax footnote. Eighty-nine percent of interviewees believe at least some tax authorities seek information about their company from outside of the tax return — particularly from the 10-K and 10-Q. One interviewee noted, "They are using [our financial statements] as a tool to understand our business and where the potential hot buttons are."[2] However, executives do not believe that all tax authorities seek or understand information from public disclosures. Interviewees explained that the likelihood a tax authority will gather and understand information from public sources varies with their skill level and expertise and that not all tax agents have the requisite resources and knowledge to obtain or accurately process information from sources outside of the tax return. One interviewee noted that tax agents in non-English speaking countries are less likely to gather information from the tax footnotes of U.S. companies.

Several interviewees expressed a desire to craft "vague" tax-related public disclosures in an attempt to limit the tax-based proprietary costs of disclosing information to federal, foreign, and state tax authorities. Some discussed wanting to craft incomplete or imprecise disclosures

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[2] To ensure the anonymity of companies and interviewees, we refer to company identifiers in the tables and text. This quote is from the tax executive at Company 2, or C2.

around uncertain tax positions and tax settlements, both of which can negatively affect cash flows by informing tax authorities about the magnitude of tax benefits at stake during an audit (Robinson and Schmidt [2013]). However, tax executives noted that their ability to withhold information is constrained by standard setters and financial reporting monitors.

Motivated by these responses, we analyze the text of a broad sample of tax footnotes from 2011 through 2021.[3] We apply a custom dictionary created by Hiller [2014] to measure vague words and phrases (hereafter, "vague words") in the tax footnote. Vagueness refers to communication that is less precise in meaning (Channell [1994]) and prior studies find that organizations use vague language to conceal their strategic actions. For example, Guo, Yu, and Gimeno [2017] find that managers of incumbent firms in the airline industry successfully deter potential entrants through vague disclosures. In a sample that includes nearly 23,000 tax footnotes, we find a significantly higher percentage of vague words in the tax footnote than the average non-tax footnote. We also find that tax footnotes are significantly more vague than the derivatives and lease footnotes, which are governed by similarly complex accounting standards (Hoitash and Hoitash [2018]). Using regression analysis, we find that vagueness in the tax footnote is increasing in tax-based proprietary costs, consistent with interviewees' responses.

Although crafting vague tax disclosures can reduce tax-based proprietary costs, it could also harm investors and analysts by reducing the amount of information available to them. Despite many interviewees mentioning that they consider investors when preparing the tax footnote, some believe investors do not read the tax footnote or do not have the requisite skills and expertise to

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[3] Interviewees also noted tax authorities' interest in other corporate disclosures such as conference calls, earnings announcements, press releases, and company websites. Although tax executives often participate in the process of communicating information outside of the tax footnote, the executives we interviewed indicated that they have less control over these disclosures than over the tax footnote. Thus, we limit our archival analysis to the tax footnote where interviewees have the most control over content.

understand detailed tax disclosures. Further, some believe that investors and analysts care only about the forecasted effective tax rate (ETR) or that these stakeholders evaluate company performance using pre-tax metrics (e.g., EBITDA). These responses reveal a belief among some interviewees that detailed narrative tax disclosures are unhelpful to investors and analysts. Thus, some of the tax executives we interviewed do not believe they face a tradeoff between disclosing information that could benefit investors and disclosing costly information to tax authorities.

To explore whether an increase in vagueness is harmful to analysts, we examine the association between tax footnote vagueness and analysts' tax forecast errors. Across 48 different regression specifications, we estimate a significantly positive association between tax footnote vagueness and analyst tax forecast error in only 15. Further, the economic significance of these associations across all specifications is modest, suggesting that analyst forecast errors increase by approximately four percent relative to the mean for a one standard deviation increase in vagueness (Cready, He, Lin, Shao, Wang and Zhang [2022]). These results corroborate some interviewees' beliefs that there is little benefit lost in terms of meeting analysts' and investors' needs when tax footnotes are more vague.

Our study offers three contributions to the literature. First, we extend the literature on tax-based proprietary costs (Bozanic et al. [2017]; Ehinger, Lee, Stomberg, and Towery [2023]; Hope et al. [2013]; Inger, Meckfessel, Zhou, and Fan [2018]; McGuire [2009]; Robinson and Schmidt [2013]) by speaking directly with the individuals who craft tax footnotes. This approach complements existing archival research by allowing for rich narratives that get inside the "black box" of the public tax disclosure process (Bloomfield, Nelson, and Soltes [2016], Soltes [2014]). Our interviewees discuss crafting vague tax disclosures — particularly around uncertain tax positions and jurisdiction-specific information — in an effort to reduce tax-based proprietary costs.

Additionally, our interviewees regularly mention foreign and state tax authorities, which suggests managers consider tax-based proprietary costs from tax authorities besides the IRS. This finding complements Chi, Persson, Shevlin, and Urcan [2023] who find that tax authorities worldwide access firms' financial statements as part of their enforcement efforts.

Second, we answer the call in Beyer, Cohen, Lys, and Walther [2010] to extend the literature on firms' disclosure decisions and the tradeoffs managers face. Rather than assuming how managers weigh the competing interests of various stakeholders based on disclosure outcomes, a qualitative approach allows interviewees to inform us which stakeholders they consider important. Our interviews provide new evidence that some managers do not believe they face a tradeoff when crafting tax disclosures to minimize proprietary costs. Although we cannot evaluate interviewees' assertion that being vague reduces tax-based proprietary costs (because we do not have access to tax audit data), we provide archival evidence in support of some interviewees' belief that being vague does not significantly harm investors.

Finally, we extend the research on how financial reporting goals (here, reducing tax-based proprietary costs) impact disclosure attributes, such as vagueness (Asay, Libby, and Rennekamp [2018]). Our multi-method approach offers unique and detailed insights about managerial discretion over tax disclosures, which would be difficult to glean with an archival-only approach. Specifically, we show how tax executives balance the stringent requirements of public tax disclosure requirements with their goal of withholding specific information that could aid tax authorities when crafting tax footnote disclosures.

II. RELATED LITERATURE AND THEORETICAL FRAMEWORK

A. An overview of information outside of tax returns that could inform tax authorities

Tax authorities may benefit from public disclosures of both tax-specific information and general business information. Most publicly available tax-specific information comes from either mandatory disclosures in financial statements or voluntary disclosures in earnings announcements and conference calls. Regarding mandatory disclosures, ASC 740 requires firms to include an income tax footnote in the 10-K that conveys tax-specific information such as a reconciliation of the U.S. federal statutory tax rate to the effective tax rate (ETR) and a tabular roll-forward and narrative disclosure of reserves for uncertain tax positions.

Within the tax footnote, managers have latitude around the detail and transparency of the information disclosed. For example, Bozanic et al. [2017] show an interquartile range of 493 to 1,031 words in the tax footnotes of a sample of public companies from 2004 through 2014. In 2012, the Financial Accounting Foundation conducted a post-implementation review of ASC 740 and concluded that required disclosures do not provide financial statement users with sufficient information to analyze the cash flow effects of income taxes, particularly about expected income tax liabilities in foreign jurisdictions and expected settlements with tax authorities.[4]

Tax authorities and other stakeholders can also glean information about taxes from disclosures not specifically about taxes. For example, segment disclosures and Exhibit 21 data contain information about the firm's geographic footprint that could help tax authorities assert in which jurisdiction income should be taxed. Additionally, discussions about significant business

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[4] In response to these findings, the FASB began issuing Exposure Drafts in 2016 aimed at increasing the usefulness of mandatory tax disclosures. However, proposals for (1) more disclosure about cash settlements with tax authorities and (2) earnings and taxes paid by country were dropped after a period of public comment (FASB [2016]). Opponents to proposed enhanced country-by-country disclosures expressed concerns about the proprietary costs of disclosing such information, including a concern that one tax authority could use information about a different tax authority to collect revenue.

transactions offer potential insights into tax consequences of events like mergers and acquisitions and reorganizations.

Prior analytical studies demonstrate that tax authorities can benefit from acquiring additional information not disclosed on the tax return (Mills and Sansing [2000]; Mills et al. [2010]). Consistent with this, then IRS Commissioner Donald Korb announced in 2007 that the IRS was "not going to turn a blind eye" to disclosures newly required by FASB Interpretation No. 48 *Accounting for Uncertainty in Income Taxes* ("FIN 48," codified as ASC 740-10) (Leone [2007]). Bozanic et al. [2017] corroborate this statement by showing that IRS downloads of Forms 10-K increased significantly after the effective date of FIN 48.

B. *Public disclosure and tax-based proprietary costs*

Disclosure is critical for corporations to provide information to external parties and manage relationships with key stakeholders (Matsumoto, Pronk, and Roelofsen [2011]; Merkl-Davies and Brennan [2017]; Bhojraj et al. [2004]). Communicating accounting information is a multidimensional process in which a manager (the source) receives and interprets information about a firm's economic events, selects the information to be communicated (the message), then encodes and transmits the message to various stakeholder groups (the destination or audience) for use in decision making (Bedford and Baladoni [1962]). To meet stakeholders' needs effectively, the manager must decide what information will be useful to the relevant stakeholders and how to deliver it. In turn, stakeholders must be able to understand the message as the manager intended it to be understood.

Stakeholders demand that corporations communicate financial information because they are either affected by (e.g., investors) or monitor (e.g., regulators) their activities and performance (Bhojraj et al. [2004]). Investors demand communication about taxes because taxes materially

affect cash flows and earnings. Furthermore, tax avoidance may impose reputational and political costs on corporations. In recent years, the media has also become interested in corporate taxes, which can worsen political and reputational costs by raising the profile of a firm's tax avoidance (Brühne and Schanz [2022]; Chen, Schuchard, and Stomberg [2019]).

However, information firms disclose to meet the demands of investors or other stakeholder groups could be useful to tax authorities in their enforcement efforts. Therefore, managers must balance the costs and benefits of a disclosure that is used by multiple audiences.[5] Disclosures of proprietary information are costly when they reveal information to an adversarial party that can reduce the firm's future cash flows (Beyer et al. [2010]). Although a vast amount of research focuses on proprietary costs of disclosing information to competitors, prior research has found that tax authorities also impose proprietary costs on the firm (Bozanic et al. [2017]; Hope et al. [2013]). Drawing from that stream of research, we use the term "tax-based proprietary costs" for information that managers believe could (1) increase the likelihood of a tax audit, (2) increase the length of a tax audit, or (3) increase the likelihood of additional taxes, interest, and penalties collected at the conclusion of a tax audit.[6] These costs could arise either because a disclosure is informative regarding a tax position that the tax authority would likely win if they challenge or because the tax authority inaccurately processes disclosed information and pursues an issue in error. Even if no additional monies must be paid, increasing the likelihood or length of an audit is costly to the firm in terms of expending internal resources to respond to revenue agents' requests

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[5] Consistent with this argument, Brühne and Schanz [2022] interview German tax risk experts and provide evidence that managers have different preferences regarding the transparency of tax-related communication depending on the intended audience. External tax communication is therefore a complex process because audiences have different information needs as well as diverse skills and expertise that affect their ability to interpret messages as intended.

[6] Tax authorities are likely a more important consideration than competitors when considering tax-based proprietary costs because tax planning strategies are often not secret. Accounting and legal advisory firms provide tax planning strategies to multiple clients. Moreover, Seidman et al. [2022] provide evidence that corporate taxpayers often confer with industry peers about tax planning strategies.

and/or engaging external consultants or attorneys to assist in the audit process (Seidman et al. [2022]).

Prior studies find significant associations between tax-based proprietary costs and attributes of firms' tax disclosures. McGuire [2009] finds managers are less likely to explain fourth-quarter decreases in GAAP ETR when those decreases are more likely attributable to proprietary tax planning strategies. Ehinger et al. [2023] find that firms mention income taxes less frequently and have shorter mentions of income taxes in conference calls and earnings announcements when IRS monitoring is higher. Robinson and Schmidt [2013] find less complete inaugural FIN 48 disclosures for firms that engage in a higher level of tax avoidance. Similarly, Inger et al. [2018] find a negative association between tax avoidance and the readability of the tax footnote for firms engaged in a high level of tax avoidance relative to industry peers. However, Balakrishnan, Blouin, and Guay [2017] find that managers attempt to use voluntary tax disclosures to reduce corporate transparency problems that arise from complex tax planning strategies. Similarly, Luo, Ma, Omer and Xie [2023] show that the market valuation of tax avoidance increases for firms that provide greater qualitative information in their tax footnote, suggesting that great tax disclosures mitigate the agency problems of tax avoidance. We extend this literature by speaking directly to the tax executives charged with preparing tax disclosures to provide new evidence on how they weigh the costs and benefits of withholding information in response to tax-based proprietary costs.

Our study also relates to the literature that examines the association between various disclosure attributes and analysts' forecasts. Hutchens [2021] finds that greater qualitative disclosures of complex tax items can increase analysts' tax forecast errors in some instances. Her findings suggest that greater tax disclosure is not necessarily beneficial to financial statement

users. Bratten, Gleason, Larocque and Mills [2017] show that discrete tax items and overall tax complexity reduce the likelihood of analysts mimicking managers' ETR forecasts but also lead to a decrease in analysts' tax forecast accuracy. Their results suggest analysts do not simply follow manager's ETR forecasts, and that analysts' ability to accurately forecast taxes is inhibited by more tax complexity.

III. INSIGHTS FROM SEMI-STRUCTURED INTERVIEWS OF TAX EXECUTIVES

A. *Interview method and sample*

Between June and December 2020, we conducted semi-structured interviews with tax executives using video conferencing software. The executives we spoke with (e.g., Tax Directors and VPs of Tax) are responsible for the tax function at their company and have the greatest influence over tax-related disclosures (e.g., Brühne and Schanz [2022]; Gracia and Oats [2002]; Morrell and Tuck [2014]; Mulligan and Oats [2016]; Radcliffe, Spence, Stein, and Wilkinson [2018]; Anesa, Gillespie, Spee, and Sadiq [2019]; Seidman et al. [2022]). We recruited interviewees through personal connections and outreach programs at two public universities. We focus on public, U.S. exchange-traded companies for consistency with prior research on public disclosure. None of the interviewees were compensated for participating in the study.

Semi-structured interviews utilize both structured and unstructured techniques to elicit responses, with the latter allowing interviewees to direct the conversation (Yin [2018]). The unstructured feature allows interviewees to share anecdotes or highlight important elements of the tax disclosure process not directly covered by our questions. This element of semi-structured interviews is crucial for our research question because it does not require us to enumerate all

possible answers to every question we asked.[7] We asked open-ended, neutral questions to minimize research bias and intrusion, which was especially important as corporate income taxes are a politicized and potentially sensitive topic (Bloomfield, Nelson, and Soltes [2016], Malsch and Salterio [2016], Yin [2018]).[8] We followed up with specific questions based on interviewees' responses whenever appropriate. Although we kept the foundation of the questions consistent across all interviews, we customized questions based on characteristics of the company, the interviewee's background, and interviewees' responses to other questions (e.g., Hirst and Koonce [1996]; Hayne and Vance [2019]; Westermann, Cohen, and Trompeter [2019]; Maksymov, Pickerd, Lowe, Peecher, and Reffett [2020]).[9] We conducted interviews during the COVID-19 pandemic but began all interviews by clarifying that our research is not focused on the effects of the pandemic.

To establish trust and rapport, which was important because we used video conferencing software instead of face-to-face interviews, we began each interview with introductions and informal chatting to break the ice (Lune and Berg [2017]; DeJonkheere and Vaughn [2019]). We also practiced active listening that incorporated visual (e.g., smiles and head nods) and verbal cues (e.g., verbal agreement and requests for interviewees to expand their responses). Interviewees spoke freely, and we intervened only when necessary.

Moreover, because income taxes are a politicized and potentially sensitive topic, we provided interviewees with a list of expected questions in advance of the interview to help establish

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[7] For example, a survey could have answered a question such as "Which stakeholders do you consider in your financial statement disclosures of tax?" but could not speak to how managers weigh these considerations and how they craft disclosures in response.

[8] After initial script creation, we conducted two exploratory interviews and modified our script based on feedback from (1) a former controller and (2) a former tax executive, both from U.S. headquartered, publicly traded companies.

[9] Responses to questions for to this study were collected as part of longer interviews that covered topics outside the scope of this paper. The approach of using data generated through field studies to address multiple research focuses is consistent with other published studies in accounting (e.g., Free [2007]; Free [2008]; Bills, Hayne, and Stein [2018]; Bills, Hayne, Stein, and Hatfield [2021]).

trust and allow them the opportunity to clear their participation in the study with appropriate parties at their company, if necessary. We audio-recorded all interviews with the interviewees' consent. Three of the authors independently read and coded the interview transcripts to highlight common responses (Yin [2018]).

Table 1 provides information about the companies where the tax executives who we interviewed worked at the time of the interview. To ensure the anonymity of companies and interviewees, we refer to company identifiers (e.g., C1, C2) in the tables and text and do not disclose personal information about interviewees (e.g., exact title). We also do not provide company-specific information with sufficient detail to identify the company. Thus, Table 1 presents numerical data in ranges rather than exact amounts.

Sample companies vary in terms of multinationality, industry, and size, with market capitalization ranging from slightly more than $1 billion to over $100 billion. Over two-thirds of the sample are multinational corporations (MNCs); one company is foreign headquartered but traded on a U.S. exchange. We observe variation in tax avoidance in the sample, measured using both GAAP and cash ETR. Finally, all of the companies were under audit in at least one jurisdiction at the time of the interview, although only 11 were under IRS audit.

Table 2 provides information about the tax executives we interviewed. We gathered information about their professional credentials and experience at the time of the interview in a post-interview survey.[10] Seventeen interviewees are CPAs and eight hold a J.D. Twenty of the 27 interviewees have at least 20 years of tax experience. We also asked interviewees how much influence they had over the tax information provided in various disclosures. On a scale of 0 to 100,

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[10] The post-interview survey was conducted between 28 and 34 months after the interviews. We collected responses from 22 of the 27 executives interviewed. We supplement information from survey responses with publicly available data where possible.

the average response for (1) tax footnotes, (2) tax disclosures elsewhere in financial statements, (3) tax information in earnings announcement, press releases and conference calls was 88.8%, 81.9%, and 79.2%, respectively. Thus, our interviewees are experienced tax executives who wield significant influence over the public tax disclosures of their companies.

B. Insights from Interviews

Managers' Perceptions about Tax Authorities Use of Public Disclosures

We asked interviewees to share their beliefs about tax authorities' use of disclosure outside the tax return in their enforcement efforts. We clarified with interviewees that "sources outside the tax return" could include communications other than the tax footnote or financial statements.

Almost 90 percent of interviewees believe tax authorities obtain information about their companies from sources outside of the tax return. Yet interviewees offered different opinions about which tax authorities they believe use information from outside the tax return to learn about the company. For example, an interviewee responded, "Outside the U.S., we think some of [the tax authorities] are [gathering information]." (C20). One interviewee speculated that language barriers outside of the U.S. can influence tax authorities' willingness to look at public disclosures noting, "auditors [in Asia] tend to not be as comfortable with English" and are therefore less likely to download the 10-K (C11). Another interviewee commented, "[N]ot every jurisdiction's sophisticated enough to know where to look for everything, but, yes, certain jurisdictions, IRS for sure, and other jurisdictions will […] I definitely think it does get looked at by certain jurisdictions." (C18). Other interviewees shared the belief that the skill level of the agent within a taxing jurisdiction was an important factor in determining the extent to which they use public

disclosure in their enforcement efforts, with "really good auditors" (C8), "good agents" (C12), and "good examination teams" (C13) accessing public disclosures.

Interviewees also elaborated on the various sources from which they believe tax authorities obtain information about the company and how tax agents use this information. Table 3 Panel B tabulates these responses. Of the interviewees who said they believe tax authorities gather information from outside the tax return, 92 percent mentioned publicly available financial statements, with one interviewee sharing, "I think they're looking at the financial statement[s] more than they're actually looking at the return." (C19) and another noting that tax authorities are "using more and more external resources to really get to know their taxpayer beyond just what you'd disclose in the tax return." (C8). Another interviewee noted that at the start of an audit, the 10-K is "one of the first things that [tax authorities] request" (C23). These insights complement archival research that finds that tax authorities review firms' financial statement disclosures (Bozanic et al. [2017]; Chi et al. [2023]).

One-third of interviewees responded they believe the tax authorities review earnings announcements, press releases, and conference calls and bring up information contained in those disclosures during an audit. One noted, "[I]t is not uncommon that they will ask us questions related to items that they have seen in the 10-Q or in a press release or heard on a conference call, on an earnings call. It's not necessarily just tax items that they ask." (C3). Additionally, one-third of interviewees mentioned news and media articles as a source of information for tax authorities. Two interviewees described situations where IRS agents reached out to them directly after reading something about the company's business in the media (C2, C4).

Finally, 45.5 percent of interviewees mentioned various other forms of communication such as board minutes (which the IRS often requests as part of its initial information document

request), company websites, and company materials from external conferences and presentations. A number of interviewees shared anecdotes of tax agents using other types of publicly available information to challenge issues related to global income sourcing. One interviewee mentioned agents looking at employees' LinkedIn profiles to try to understand the global reach of individuals' responsibilities, and the implications that might have from a transfer pricing perspective (C9). Another talked about the tax authority using slides that were presented at an industry conference to challenge assertions about the company's supply chain and global operations. (C5).[11] These responses add new insights about where tax agents seek out information and how they use the information in their enforcement efforts.

How Executives Shape Tax Disclosures in Response to their Perceptions

Overall, interviewees' responses suggest that tax executives believe some federal, foreign, and state tax authorities use public disclosures in their enforcement efforts. We asked interviewees how this belief shapes the content of the tax footnote. Several interviewees highlighted the desire to limit the usefulness of these disclosures to tax authorities, with three interviewees specifically using the word "vague" unprompted to characterize their ideal financial statement tax disclosures. For example, "We're always kind of vague," (C15), "We are a little bit vague […] as we discuss tax-specific items," (C17), and "We'll work with [our financial statement auditor] and say, 'Okay.

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[11] These responses show tax authorities' influence reaches beyond the tax department. Almost one-third (30%) of interviewees mentioned conflicts among internal stakeholders over tax-related disclosure. One interviewee characterized their own appetite for detail as "very different than the CFO who wants to describe everything to the minute detail." (C19). Another characterized their Chief Accounting Officer as a "man of few words" (C4) and another explained, "… we're players and participants in that process but if [interviewee referring to themselves in third person] wants something in there that the other people don't, or I want something excluded that they think should be included, [interviewee] loses." (C16). Although managers in the tax department (1) drive actual tax decisions and tax-related outcomes (e.g., Gracia and Oats [2002]; Morrell and Tuck [2014]; Mulligan and Oats [2016]; Radcliffe et al. [2018]; Anesa et al. [2019]; Seidman et al. [2022]), (2) are knowledgeable about the potential costs of disclosing tax information, and (3) could face reputation costs of adverse outcomes from tax-related disclosures, they do not always prevail in shaping tax-related disclosure outside the tax footnote.

We've got to meet this disclosure requirement,' but we're not going to specifically say, 'We're going to be more vague…'" (C18).[12]

Other interviewees' suggested a desire for vagueness without using the word "vague," such as one interviewee who noted, "We don't need to over disclose this […] That's really the only interplay with the audit […] knowing that the examiners are going to look at it. That drives a lot of how I want to disclose or phrase things." (C19). Others expressed not wanting to be specific about which jurisdiction tax issues relate to such as, "We kind of dance around things … we'll never mention a specific jurisdiction or even if it's foreign, or U.S., or state." (C2).

Interviewees regularly mentioned wanting to minimize qualitative disclosures around FIN 48 so as not to inform tax authorities about how much they have "put to the side" in FIN 48 reserves for potential repayment (C11). For example, one interviewee stated, "We would use language like 'in certain foreign jurisdictions.' We would never call out a specific country where a reserve was or anything like that." (C27). With respect to state tax authorities specifically, another said, "We're very careful if we've got a state tax reserve. We certainly don't identify how much reserve we have with each state." (C8). A few commented about not wanting to provide a clear "roadmap" to tax authorities such as, "I try not to give a roadmap […] Will I say that I have state tax reserves? Yes. Am I going to provide a list of states where I think I have economic nexus problems? No." (C25). Similarly, another noted, "You don't want to give a roadmap." (C26). Another interviewee stated, "I don't want to over disclose, because I know somebody's going to be looking at it and my attempt

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[12] Vague tax disclosures can comply with disclosure mandates without providing clear detail to tax authorities or revealing managers' strategic intentions. For example, firms can implement a tax planning strategy involving IP migration that requires firms to restructure their subsidiaries. To explain this strategy, firms can disclose that differences between their ETR and the statutory tax rate include the effect of restructuring "various" or "certain" subsidiaries without specifying whether the restructuring involved relocating subsidiaries to a different jurisdiction or changing their organizational form, or which foreign subsidiaries were involved. Although this disclosure meets the letter of the SEC disclosure requirements, it is vague because it does not precisely quantify the nature of the tax planning strategy implemented, nor the extent of the benefit derived from it.

is always to be honest but not over disclose." (C21). In addition to disclosures around the location of tax reserves, a number of interviewees mentioned that disclosures around settlements with tax authorities can be problematic if they make tax authorities feel they left money on the table after an audit. One interviewee noted, "I'm very sensitive to if we settle some audits and then we have a large reserve release … are they looking at that going, 'Was that us? You released that much money related to this audit?'" (C15).

Despite a desire to be vague, interviewees discussed the constraints that financial reporting regulators and monitors place on them. More than half (52%) of all interviewees mentioned financial reporting regulators as a key external stakeholder group that influences their tax disclosures. For example, one interviewee summarized they want to be "as skinny as we can be for disclosures without violating any SEC rules." (C10). Another noted, "I would always comply with the SEC first and foremost and let the chips fall where they may with the tax authorities." (C12). Other interviewees discussed the role their financial statement auditors play in shaping mandatory disclosures, especially with pressure from PCAOB inspections. For example, "I mean, we disclose what we have to disclose, and our external auditors will tell us we need to include certain things if we don't." (C8).

Many interviewees mentioned investors as a group they consider when making tax disclosure decisions. However, interviewees were split on whether extensive disclosure — particularly of complex tax information — was useful to investors. For example, in response to the question, "Do you think a lot about investors when you're making tax related disclosures?", one interviewee said, "I think we're much more sensitive in disclosures to thinking about how investors will view something," (C9) but another stated, "I don't know how much the reader really

understands regardless of what you say." (C14). Another interviewee said, "I do not think that many [investors] spend much time in the tax footnote." (C19).[13]

Interviewees were also skeptical that analysts, who are often considered to be more sophisticated than the average investor, benefit from detailed qualitative tax disclosures. One interviewee stated, "The analysts' call – they're so concerned about the top line and our operating margins. Then, our CFO will talk to the tax rate. Analysts don't ask questions about it. So we don't talk much about it other than we tell them what the rate is for the quarter and for the year to date." (C10). Another said, "I don't feel like there's much loss because all they care about at the end of the day is that tax rate and the projected tax rate … all they care about is the number and how to build that into their models." (C1). These perceptions are consistent with the findings in Ehinger et al. [2023] that managers focus on discussions of tax expense and ETR during conference calls.

Thus, some interviewees believe that the investors and analysts who do engage with the tax footnote care only about what the ETR is and do not demand additional qualitative disclosure that explains the rate. As such, some interviewees believe that vague tax disclosures do not harm investors and analysts. Some interviewees indicated hesitance to provide highly disaggregated (e.g., jurisdiction specific) tax disclosure because of worries that investors are not be able to correctly interpret the information. These responses echoed some public commentary on the FASB's Exposure Draft that providing more granular disclosure of taxes and income to investors could create confusion, especially if the tax disclosure conflicts with other disclosures (FASB [2016]).

Researchers often assume that managers face a tradeoff when deciding whether to disclose information that could help investors better understand complex issues but that could also bear

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[13] Robinson and Schmidt [2013] find some support for the theory that proprietary costs reduce investor demand for full disclosure [Verrecchia 1983]. Our interviewees did not offer any discussion of this phenomenon.

proprietary costs. Interviewee responses challenge this assumption — at least for tax disclosures — and indicate that managers sometimes doubt whether investors and analysts understand and appropriately interpret detailed tax disclosures. Given interviewees' stated preference for tax footnotes to be "vague," which is not a construct that has been examined in prior tax research, we next undertake large-sample archival analyses to explore the vagueness of the tax footnote.

IV. CORROBORATING INTERVIEW RESULTS WITH ARCHIVAL DATA

A. *Defining the sample and variables of interest*

Drawing from language used by our interviewees, we use large-sample archival data to validate and assess the generalizability of interviewees' responses about "vague" tax footnote disclosures. Hiller, Marcotte, and Martin [1969], a seminal paper in the exploration of vagueness, discuss vagueness as an important characteristic of written communication. Vague language often includes qualifiers such as "about" or "nearly" and uses terms that reflect approximation rather than precision (e.g., "may", "perhaps", etc.).[14] Prior research has shown that organizations use vague language to conceal their strategic intentions and successfully deter potential competitors from entering the market (Guo et al. [2017]).

We begin by providing descriptive data on the vagueness of the tax footnote compared to the average non-tax footnote. We do this because one interviewee noted, "Of course, [tax executives are] very different than the CFO who wants to describe everything to the minor of detail. Really, we don't want to do that in the tax world." (C21). Thus, we might expect the tax footnote to be more vague than other footnotes, on average. We also compare the vagueness of the tax footnote to other footnotes governed by similarly complex accounting standards to address any

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[14] Vagueness is distinct from readability and length. Appendix A provides excerpts from firm's tax footnotes to show that even a short disclosure can be vague (Example 1) and that vagueness can differ while holding readability constant (Example 2 compared to Example 3).

correlation between complexity and vague words. Next, we examine whether the vagueness of the tax footnote is increasing in tax-based proprietary costs. Finally, we examine whether analysts' tax forecast errors are increasing in the vagueness of the tax footnote.

Sample construction

Our sample begins with the 43,768 Compustat observations between 2011 and 2021 that are incorporated in the U.S. and publicly traded. We match Compustat data to firms' tax footnote text data from the XBLR Research website (Hoitash, Hoitash, and Morris [2021]). We remove observations missing data needed to compute regression variables. Because we use ETRs as a proxy for tax-based proprietary costs, we also eliminate observations where pre-tax income is missing or non-positive, consistent with prior research. For our tests examining the association between the vagueness of the tax footnote and tax-based proprietary costs, our sample consists of 22,737 firm-year observations from 4,247 unique firms. Tests that examine the association between analysts' tax forecast errors and the vagueness of the tax footnote use a sample of 5,781 observations across 1,704 unique firms. Table 4 summarizes the sample selection process.

Measuring Tax Footnote Vagueness

We implement textual analysis to identify vague words or phrases using the Hiller "communication vagueness" dictionary (Hiller [2014]; Hiller et al. [1969]). The dictionary is comprised of 362 vague words and phrases. Appendix A provides examples of vague words and phrases in firms' tax footnotes. We measure the vagueness of a firm's tax footnote, *Tax FN Vagueness*, in two ways: 1) *Tax FN Vague Percent* is the count of vague words and phrases divided

by the count of all words in firm i's tax footnote in year t, and 2) *Tax FN Vague Count* is the count of vague words and phrases in firm i's tax footnote in year t.[15]

B. *Validating statements about vagueness: Simple statistical analysis*

First, we test whether our interviewees' stated preference for vague tax footnote disclosures is evident in a broad sample of firms by comparing the relative vagueness of the tax footnote. We measure vagueness as the percentage of vague words and phrases in the footnote divided by the count of all words in the footnote. Figure 1 compares the tax footnote to (1) the average non-tax footnote, (2) the derivatives footnote, and (3) the lease footnote. We choose the derivatives and lease footnotes for comparison because they are governed by similarly complex accounting standards as the tax footnote (Hoitash and Hoitash [2018]). We require an observation to have both footnotes (e.g., a tax footnote and a lease footnote) to be included in that comparison. We find that the tax footnote is significantly more vague than the average non-tax footnote, the derivatives footnote, and the lease footnote. Overall, this analysis validates that interviewees' statements about preferring vague tax disclosures generalizes.

C. *Tax footnote vagueness as a function of tax-based proprietary costs*

Research Design

We estimate the equation below to test the association between the vagueness of the tax footnote and tax-based proprietary costs:

$$Tax\ FN\ Vagueness = \beta_0 + \beta_1 Tax\ Proprietary\ Cost + \Sigma\beta\ Controls + Fixed\ Effects + \varepsilon \quad (1)$$

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[15] We use the count of vague words and phrases (*Tax FN Vague Count*) when this measure of vagueness is the dependent variable because of econometric and interpretation issues when using the log of one plus the outcome variable (Cohn, Liu, and Wardlaw [2022]). We use the natural log of one plus the count of vague words and phrases (*Ln(Tax FN Vague Count)*) when this measure of vagueness is an independent variable.

When *Tax FN Vague Percent* is the dependent variable, we estimate equation (1) using ordinary least squares (OLS) regression. When *Tax FN Vague Count* is the dependent variable, we estimate equation (1) using a fixed-effects Poisson model (Cohn et al. [2022]).

Based on interviewees' responses, we construct multiple proxies to capture *Tax Proprietary Cost*. First, we include two measures of tax avoidance. *GAAP ETR* (*Cash ETR*) equals total tax expense (cash taxes paid) divided by pre-tax income multiplied by negative one so that each measure is increasing in tax avoidance. An implicit assumption is that tax-based proprietary costs are increasing in the level of tax avoidance; when firms claim larger benefits on tax returns, there is the possibility for a more negative impact on future cash flows if these benefits are disallowed upon audit. Thus, we expect to find a positive coefficient on β_1 when *GAAP ETR* and *Cash ETR* are the variables of interest. Second, we include two variables to capture proprietary costs that arise from firms' uncertain tax positions, which many of our interviewees' specifically notes as an area of concern. *UTB* is an indicator variable equal to one if the firm reports a non-zero and non-missing ending balance in its reserve for uncertain tax benefits (UTB). *Settle* is an indicator variable equal to one if the firm reports a non-missing and non-zero value for settlements related to uncertain tax benefits. Proprietary costs are increasing in both of these measures of uncertain tax benefits. Thus, we expect to find a positive coefficient on β_1 when *UTB* and *Settle* are the variables of interest.

Third, we measure tax-based proprietary costs using *Footprint*, which is measured as the natural log of one plus the number of unique states and countries mentioned in a firm's 10-K. Interviewees indicate that they consider federal, foreign, and state jurisdictions when crafting tax disclosures. Thus, the desire to be vague should be higher when a firm operates in more jurisdictions because the likelihood that a tax authority finds information in public disclosures

increases with the number of interested tax authorities. Therefore, we expect to find a positive coefficient on β_1 when *Footprint* is the variables of interest.

We draw a robust array of control variables from prior literature (e.g., Bozanic et al. [2017]; Inger et al. [2018]). When *Tax FN Vague Count* is the dependent variable, we also control for the non-vague information included in the tax footnote using *Tax FN Non-Vague Count*. We winsorize all continuous variables at the 1st and 99th percentile. Finally, we include year and Fama French 49 industry fixed effects and cluster standard errors by firm (Petersen [2009]). We define all variables in Appendix B.

Descriptive Data

Table 5 provides descriptive statistics for the sample used to estimate equation (1). The mean (median) percentage of vague words and phrases in the tax footnote is 2.29 (2.29), and the mean (median) number of vague words is 17.29 (15.00). The mean *GAAP ETR* (*Cash ETR*) in our sample is -21.49 percent (-24.96 percent). Further, 55.44 percent of sample observations report a non-zero value of uncertain tax benefits, and 22.66 percent of sample observations report a current year settlement in their FIN 48 roll-forward. The raw mean (median) of the total number of unique states and countries mentioned in a firm's 10-K is 27.31 (22.00).[16]

Results

Table 6, Panel A (Panel B) provides the results of estimating equation (1) with *Tax FN Vague Percent* (*Tax FN Vague Count*) as the dependent variable. In Panel A (Panel B), we estimate statistically significant positive coefficients as predicted across four (three) of our five proxies for

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[16] Vagueness is distinct from both length and readability. The correlation between *Tax FN Vague Percent* and the length of the tax footnote is 0.1591 and is significant at the 1% level. Although positive, the correlation is relatively low. The correlation between *Tax FN Vague Percent* and Fog Index is -0.0519 and is significant at the 1% level. Thus, vague disclosures are *more* readable. Appendix A provides examples of tax footnote paragraphs with varying levels of vagueness and readability.

tax-based proprietary costs. In Panel A, the coefficient on *GAAP ETR* suggests that a one percentage point increase in the *GAAP ETR* is associated with a 0.040 percentage point increase in the percentage of vague words and phrases, which is 1.7 percent of the sample mean. The coefficient on *Footprint* indicates that a one percent increase in the count of unique states and countries mentioned in a firm's Form 10-K is associated with a 0.087 percentage point increase in *Tax FN Vague Percent*, which is 3.8 percent of the sample mean. In Panel B, when the dependent variable is *Tax FN Vague Count*, the coefficient on *Settle Indicator* indicates firms that report settlements in the FIN48 roll-forward are associated with an increase in *Tax FN Vague Count* by a factor of 1.021. Together, these results provide evidence that the vagueness of tax footnotes in increasing in tax-based proprietary costs. This analysis corroborates interviewees' responses about their desire to use vague language in the tax footnote to reduce tax-based proprietary costs.

Robustness

We undertake a number of additional specifications to gauge the robustness of our results. In Column (1) of Table A1 in the Online Appendix, we include all measures of tax-based proprietary costs in the same regression. We find statistically significant coefficients in the predicted direction on *GAAP ETR*, *Settle Indicator*, and *Footprint* using both of our dependent variables, consistent with our main results. In Columns (2) and (3), we use average three-year industry-size adjusted measures of GAAP and Cash ETR (which reduces the sample size due to additional data requirements) and find *Tax FN Vague Percent* increases for firms with GAAP ETRs that are lower than the industry-size average. Consistent with our main results, neither *Tax FN Vague Percent* nor *Tax FN Vague Count* are significantly related to the three-year industry-size adjusted Cash ETR. In Columns (4) and (5) of Table A1, we estimate *Tax FN Vague Percent* and *Tax FN Vague Count* as a function of continuous Settlement and UTB measures. We find that

tax footnote vagueness is increasing in the continuous UTB measure when *Tax FN Vague Percent* is the dependent variable. Further, tax footnote vagueness is increasing in the continuous Settlement measure across both dependent variables. These results are broadly consistent with our main results. Additionally, in Table A2 of the Online Appendix, we estimate equation (1) with u*Ln(Tax FN Vague Count)* as the dependent variable using OLS regression instead of a fixed-effects Poisson model. We again find statistically similar results compared to Panel B of Table 6.

Finally, Table A3 of the Online Appendix presents a replication of the analysis in Table 5 of Bozanic et al. [2017]. Bozanic et al. [2017] study the effect of tax-based proprietary costs on the length of tax footnotes around the implementation of Schedule UTP.[17] We replicate their result that footnotes are longer after the implementation of Schedule UTP, and we find that tax footnotes are *more vague* after the implementation of Schedule UTP. Thus, our findings reveal a potentially more nuanced relationship between Schedule UTP and the informativeness of tax footnotes.

D. *The impact of tax footnote vagueness on users of financial statements*

Several interviewees stated they do not believe investors or analysts read or understand tax disclosures. Thus, our final analysis examines how vagueness in the tax footnote impacts users of the financial statements. We focus on analyst forecast errors for two reasons. First, analysts are important capital market intermediaries that use the financial statements for their forecasts. Second, prior tax research that focuses on users of the financial statements often examines the association between disclosures and analyst forecast accuracy (e.g., Balakrishnan et al. [2018];

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[17] Bozanic et al. [2017] posit that the implementation of Schedule UTP reduced the tax-based proprietary costs of public disclosure by requiring firms to privately disclose information about their uncertain tax positions to the IRS. They find longer tax footnotes after the implementation of Schedule UTP for firms subject to the disclosure and conclude that tax footnotes are more informative.

Ehinger et al. [2023]; Hutchens [2021]). Thus, focusing on analysts helps contextualize our findings within the existing literature.

Research design

We estimate the following regression on the sample of firms with analyst forecast data:

Tax Forecast Error$_{t+1}$ = β$_0$ + β$_1$Tax FN Vagueness + Σβ Controls + Fixed Effects + ε   *(2)*

The dependent variable, *Tax Forecast Error$_{t+1}$*, takes on one of three values. First, *Tax Expense Forecast Error$_{t+1}$* is equal to the absolute value of the difference between the implied I/B/E/S consensus analyst tax expense forecast per share and the implied I/B/E/S actual tax expense per share for year *t+1*. We scale the tax expense forecast error by ending stock price in year *t* (Balakrishnan et al. [2018]; Bratten et al. [2017]; Francis, Neuman, and Newton [2019]). When *Tax Expense Forecast Error$_{t+1}$* is the dependent variable, we also control for the pre-tax book income analyst forecast error (*PTBI Forecast Error$_{t+1}$*) because tax expense forecast error is affected by forecast errors of pre-tax income. Second, *ETR Forecast Error$_{t+1}$* is equal to the absolute value of the difference between the implied I/B/E/S consensus analyst ETR forecast and the implied I/B/E/S actual ETR for year *t+1* (Bratten et al. [2017]; Francis et al. [2019]). Third, *ETR Forecast Error/Price$_{t+1}$* is equal to *ETR Forecast Error$_{t+1}$* divided by ending stock price in year *t* (Hutchens [2021]). We scale by price to address the possible influence of outliers and to make the ETR forecast error variable more comparable to the scaling used to compute *ETR Forecast Error$_{t+1}$*. For all three measures of *Tax Forecast Error$_{t+1}$*, we measure mean consensus analyst tax forecast as the first I/B/E/S mean consensus forecast for year *t+1* issued within 60 days of the issuance of Form 10-K for year *t*.

The variable of interest is either *Tax FN Vague Percent* or *Ln(Tax FN Vague Count)*. A positive and significant coefficient on either indicates that the vagueness of the tax footnote

impedes analysts' abilities to accurately forecast future taxes. Following prior research, we include a robust array of control variables that are associated with analyst tax forecast errors (e.g., Balakrishnan et al. [2018], Bratten et al. [2017], Ehinger et al. [2023]; Hutchens [2021]). Importantly, we include variables that capture other textual characteristics of the tax footnote including the length of a firm's tax footnote (*Tax FN Length*) (Hutchens [2021]), and the readability of the firm's tax footnote (*Tax FN Fog*) (Inger et al. [2018]). Finally, we include year Fama French 49 industry fixed effects and cluster standard errors by firm (Petersen [2009]). We define all variables in Appendix B.

Descriptive Data

Table 7 provides descriptive statistics for the sample used to estimate equation (2). The mean percentage (raw count) of vague words and phrases in the tax footnote is 2.32 (18.94), similar to the larger sample used to estimate equation (1). The mean (median) of *Tax Expense Forecast Error$_{t+1}$* is 0.0116 (0.0048), which is consistent with Balakrishnan et al. [2018]. The mean (median) value of *ETR Forecast Error $_{t+1}$* is 0.1271 (0.0260), which is consistent with Bratten et al. [2017]. Finally, the mean (median) value of *ETR Forecast Error/Price $_{t+1}$* is 0.0103 (0.0008).

Results

Table 8, Panel A (Panel B) provides the results of estimating equation (2) when the variable of interest is *Tax FN Vague Percent* (*Ln(Tax FN Vague Count)*). Across both panels, we estimate a positive and significant coefficient on *Tax FN Vagueness* in only one-third of the specifications. This finding suggests that additional vagueness in the tax footnote is at most only weakly associated with an increase in analyst tax forecast errors.

To gauge the robustness of these results, we estimate 42 additional specifications that modify the calculation of analysts' forecast errors. Whereas in our main specification in which we

measure analyst tax forecast errors using the *mean* value of the first consensus analyst tax forecast issued within *60 days* of the issuance Form 10-K and winsorized the variable at the *1st* and *99th* percentile, we make the following modifications in the robustness tests: (1) we measure analyst tax forecast errors using the *median* value of the first consensus forecast issued by I/B/E/S, (2) we use forecasts issued within *90* days of the issuance of Form 10-K, and (3) we winsorize the analyst tax forecast errors at the 5th and 95th percentile because Balakrishnan et al. [2018] note analyst forecasts errors of tax expense contain significant noise. We re-estimate equation (2) using all combinations of these three modifications. By incorporating these additional methods of calculating analyst tax forecast errors, we provide assurance that our main inferences are not purely a result of certain choices made for calculating analyst tax forecast errors.

Table 9, Panels A, B, and C provide the results of estimating equation (2) incorporating these alternative methods for calculating analyst tax forecast errors. Though all controls and fixed effects are included as detailed above, for brevity we report only the coefficients and t-statistics on our variables of interest (i.e., *Tax FN Vague Percent* and *Ln(Tax FN Vague Count)*). Panel A (Panel B) [Panel C] provides the results when the dependent variable is *Tax Expense Forecast Error$_{t+1}$* (*ETR Forecast Error$_{t+1}$*) [*ETR Forecast Error/Price$_{t+1}$*]. The first row of each panel reproduces the coefficients and t-statistics from Table 8, Panels A and B, for ease of comparison. Across all 48 specifications, we find positive and significant association between *Tax FN Vagueness* and *Tax Forecast Error$_{t+1}$* in only 15 specifications. Further, averaging across all specifications, we estimate that analyst tax forecast errors increase by approximately 3.89 percent relative to the mean for a one standard deviation increase in vagueness. Overall, our evidence suggests that more vague disclosures are at most weakly associated with higher analyst tax forecast

errors. This result corroborates the beliefs of some interviewees that vague tax disclosures do not harm investors.

V. CONCLUSION

We use semi-structured interviews with public company tax executives to offer new evidence regarding how tax authorities influence external communication. Interviewees overwhelmingly believe tax authorities seek information outside of the tax return in their enforcement efforts. The vast majority of these interviewees believe quarterly and annual disclosures provide potentially useful information to tax authorities, especially narrative disclosures about uncertain tax positions in the tax footnote. In response, several interviewees communicated a desire to provide "vague" disclosures. However, they also discussed frictions to this objective, including FASB and SEC disclosure requirements and financial statement auditor monitoring. In addition, even though some interviewees believe investors are an important audience of tax disclosures, a number also question whether the average investor is sophisticated enough to understand and benefit from tax disclosures. These results suggest that some managers do not view vague disclosures as costly to investors.

We use tax footnote data to test whether interviewees' stated preference for vagueness is observable in tax footnotes. Consistent with interviewees' responses, we find that the tax footnote is significantly more vague than nearly all other individual footnotes. Further, we find that vagueness increases with tax-based proprietary costs. Finally, we test whether statements by some interviewees that investors do not bear costs of vague tax reporting are borne out in the data. Consistent with these claims, we do not find strong evidence that vague tax disclosures are associated with increased analyst tax forecast errors. Overall, our archival results support most of our interviewees' statements around vagueness in tax disclosures.

APPENDIX A: EXAMPLES OF VAGUE WORDS AND PHRASES IN TAX FOOTNOTES

This appendix provides excerpts from firms' tax footnotes to highlight the usage of vague words and phrases per Hiller's [2014] communication vagueness dictionary. Vague words and phrases are bold and highlighted. Following each excerpt, the percentage of vague words and phrases is provided, where the percentage is calculated as the total number of vague words and phrases divided by the total number of words within the excerpt. For context, the average percentage of vague words within the entire tax footnote is 2.29 percent.

To capture readability, the Fog Index is provided. The value of the Fog Index corresponds with the grade level needed to understand the context. Higher values of the Fog Index indicate lower readability. For context, Li [2008] finds the mean Fog Index of the notes to the financial statements is 18.96.

Example 1: High Readability and Highly Vague

Fulton Financial Corporation – 10-K FYE 12/31/2013

> Substantially **all of these** losses **may** be carried forward through 2018. If sufficient capital gains are not realized during this period, **some** or **all of this** deferred tax asset may need to be written off.

Percentage of vague words and phrases: 11.43%, Fog Index: 11.57

Example 2: Low Readability and Highly Vague

Hormel Food Crop – 10-K FYE 10/31/2020

> The Company is in **various** stages of audit by **several** state taxing authorities on a variety of fiscal years, as far back as 2011. While **it** is possible that one or more of these audits **may** be completed within the next 12 months and the related unrecognized tax benefits **may** change based on the status of the examinations, **it** is not possible to estimate the effect of any amount of **such** change to previously recorded uncertain tax positions.

Percentage of vague words and phrases: 8.97%, Fog Index: 21.75

Example 3: Low Readability and Not Vague

Mikros Systems Corp – 10-K FYE 12/31/2012

> During 2012, the Company utilized federal net operating loss carryforwards of $298,382 and $40,574 of net operating loss carry forwards expired for purposes of the Company's tax provision. The Company's valuation allowance associated with the related deferred tax assets was decreased by approximately $108,565 and $253,081 in 2012 and 2011, respectively, based on the Company's new contracts and continued profitability on existing contracts.

Percentage of vague words and phrases: 0.00%, Fog Index: 21.49

APPENDIX B: VARIABLE DEFINITIONS
Variables of interest in equation (1)

Variable Name	Description
Tax FN Vague Percent	The count of vague words and phrases in firm *i*'s tax footnote in year *t* divided by the count of total words in firm *i*'s tax footnote in year *t*. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. Tax footnote data is obtained from www.XBRLresearch.com.
Tax FN Vague Count	The count of vague words and phrases in firm *i*'s tax footnote in year *t*. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. Tax footnote data is obtained from www.XBRLresearch.com.
GAAP ETR	Total tax expense (TXT) divided by pre-tax book income (PI) for firm *i* in year *t*.
Cash ETR	Total cash taxes paid (TXPD) divided by pre-tax book income (PI) for firm *i* in year *t*.
UTB Indicator	An indicator variable equal to one if firm *i* in year *t* reports a non-missing and non-zero value for ending uncertain tax benefits (TXTUBEND), and zero otherwise.
Settle Indicator	An indicator variable equal to one if firm *i* in year *t* reports a non-missing and non-zero value for settlements related to uncertain tax benefits (TXTUBSETTLE), and zero otherwise.
Footprint	The natural log of one plus the number of unique states and countries mentioned in a firm *i*'s 10-K in year *t* per 10-K textual data obtain from the Notre Dame Software Repository for Accounting and Finance website.

Variables of interest in equation (2)

Variable Name	Description
Tax Expense Forecast Error$_{t+1}$	The mean analyst forecast implied tax expense error for firm *i* in year *t+1* calculated as the absolute value of the difference between the implied I/B/E/S actual tax expense and the analyst consensus implied I/B/E/S tax expense forecast scaled by total shares outstanding (CSHPRI) and divided by the ending stock price (PRCC_F) for year *t*. I/B/E/S implied tax expense is calculated as the difference between I/B/E/S pre-tax income (PRE) and after-tax income (NET). The analyst consensus forecast is the mean value of the first consensus analyst forecast per I/B/E/S' summary file issued during the first 60 days following the issuance of the 10-K for year *t*.
ETR Forecast Error$_{t+1}$	The mean analyst forecast implied ETR error for firm *i* in year *t+1* calculated as the absolute value of the difference between the implied I/B/E/S actual ETR and the analyst consensus implied I/B/E/S ETR forecast. I/B/E/S implied ETR is calculated as the difference between I/B/E/S pre-tax income (PRE) and after-tax income (NET), divided by I/B/E/S pre-tax income. The analyst consensus forecast is the mean value of the first consensus analyst forecast per I/B/E/S' summary file issued during the first 60 days following the issuance of the 10-K for year *t*.

APPENDIX B: VARIABLE DEFINITIONS (CONTINUED)

Variable Name	Description
ETR Forecast Error/Price$_{t+1}$	*ETR Forecast Error$_{t+1}$* scaled by the ending stock price (PRCC_F) for year *t*.
Ln(Tax FN Vague Count)	The natural log one plus *Tax FN Vague Count*.

Control Variables

Variable Name	Description
Tax FN Non-Vague Count	The natural log one plus the count of non-vague words in firm *i*'s tax footnote in year *t*. Tax footnote data is obtained from www.XBRLresearch.com.
Assets	The natural log of firm *i*'s total assets (AT) at the end of year *t*.
ROA	Pre-tax book income (PI) divided by total assets (AT) for firm *i* in year *t*.
Leverage	Total ending debt (DLTT) divided by lagged total assets (AT) for firm *i* in year *t*.
R&D Intensity	R&D expense (XRD) divided by total sales (SALE) for firm *i* in year *t*. Missing values of R&D expense are reset to zero.
Capital Intensity	Net property, plant, and equipment divided by lagged total assets (AT) for firm *i* in year *t*.
Intangible Intensity	Intangible assets (INTAN) divided by lagged total assets (AT) for firm *i* in year *t*.
Change in NOL	The difference between net operating losses (TLCF) between year *t* and year *t-1*, divided by lagged total assets (AT) for firm *i*. Missing values of net operating losses are reset to zero.
10-K Length	The natural log of one plus the count of the total number of words in firm *i*'s 10-K in year *t* per data obtain from the Notre Dame Software Repository for Accounting and Finance website.
APTS	The natural log of one plus the dollar value of auditor provided tax services per Audit Analytics.
Auditor Tenure	The natural log of one plus the number of years firm *i*'s current auditor has served as auditor per Audit Analytics.
UTB	Total ending uncertain tax benefits (TXTUBEND) scaled by total assets (AT) for firm *i* in year *t*.
ETR Volatility	The standard deviation of firm *i*'s *GAAP ETR* from *t-4* through year *t*.
Book-Tax Differences	Book-tax differences calculated as the absolute value of pre-tax income (PI) less taxable income scaled by lagged total assets (AT). Taxable income is calculated as federal tax expense grossed up by the federal statutory tax rate plus pre-tax foreign income (PIFO) less the change in net operating losses.
Firm Age	The natural log of the number of years firm *i* is publicly traded using the date of the firm *i*'s first return (BEGRET) per CRSP.
Geographic Complexity	The multinational complexity of a firm following Balakrishnan et al. [2018] and Bushman, Chen, Engel, and Smith [2004], calculated as the sum of the squares of each geographic segment's sales (SALE) as a percentage of total firm sales (SALE) for firm *i* in year *t*.

APPENDIX B: VARIABLE DEFINITIONS (CONTINUED)

Variable Name	Description
Market-to-Book	The ending market value of equity, calculated as the ending share price (PRCC_F) multiplied by the number of common shares outstanding (CSHO), divided by book value of equity (CEQ) for firm i in year t.
Sales Volatility	The standard deviation of total sales (SALE) from year $t-4$ through year t for firm i.
Analyst Following	The natural log of one plus the number of analysts following firm i in year t.
Tax FN Length	The natural log one plus the count of the total words in firm i's tax footnote in year t per footnote data obtained from www.XBRLresearch.com.
Tax FN FOG	The Fog Index of the firm i's tax footnote in year t per footnote data obtained from www.XBRLresearch.com.
PTBI Forecast Error$_{t+1}$	The median analyst forecast pre-tax book income error for firm i in year $t+1$ calculated as the difference between the I/B/E/S actual pre-tax income (PRE) and the analyst consensus implied I/B/E/S pre-tax income forecast scaled by total shares outstanding (CSHPRI) and divided by the ending stock price (PRCC_F) for year t. The analyst consensus forecast is the median value of all analysts' forecasts issued during the first 60 days following the issuance of the 10-K for year t. For analysts issuing more than one forecast within the first 60 days following the issuance of the 10-K, only the first forecast is retained.

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FIGURE 1: FOOTNOTE VAGUENESS BY FOOTNOTE TYPE
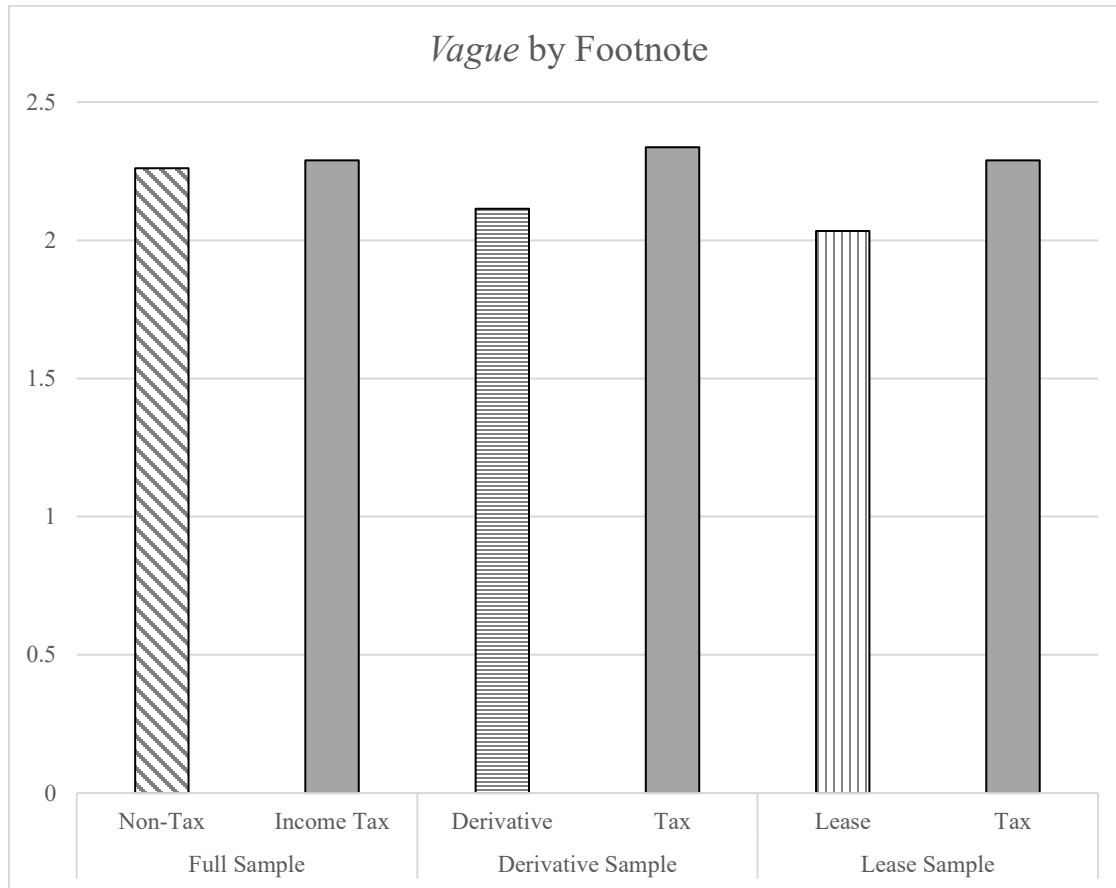
This figure plots the percentage of vague words and phrases in the tax footnote relative to other footnotes for the period 2011-2021 using the Hiller [2014] communication vagueness dictionary and footnote data provided at www.XBRLresearch.com. The first two columns compare the tax footnote to the average non-tax footnote for the main sample of 23,737 firm-years; vague and total words are first summed across all non-tax footnotes and then the percentage of vague words is calculated. The next two columns compare the tax footnote to the derivatives footnote for the 10,202 firm-years with both a tax footnote and a derivatives footnote. The final two columns compare the tax footnote to the lease footnote for the 5,059 firm-years with both a tax footnote and a lease footnote. We select derivatives and leases as comparative footnotes following Hoitash and Hoitash [2018] who consider leases, derivatives, and taxes to have similar accounting reporting complexity based on FASB Exposure Drafts aimed at their simplification. All differences are statistically significant at p < 0.01.

TABLE 1: DESCRIPTIVE STATISTICS: SEMI-STRUCTURED INTERVIEW SAMPLE

Company code	MNE?	Industry	Market Cap	*GAAP ETR*	*Cash ETR*	Under Audit?
C1	No	Other	Medium	High	Low	State
C2	Yes	Consumer Goods	Medium	High	High	State, For
C3	No	Other	Large	Low	Low	US, State
C4	Yes	Other	Large	Low	Low	US, For
C5	Yes	Consumer Goods	Large	Low	Low	State, For
C6	Yes	Consumer Goods	Medium	High	High	US, State, For
C7	Yes	Other	Large	High	High	US, State, For
C8	No	Other	Large	High	Low	State
C9	Yes	Manufacturing	Large	High	High	US, State, For
C10	Yes	Health	Large	Low	Low	US, State, For
C11	Yes	Consumer Goods	Medium	High	Low	State, For
C12	Yes	Health	Large	Low	High	US, State, For
C13	Yes	Consumer Goods	Large	Low	Low	US, State, For
C14	Yes	Other	Large	High	Low	US, State, For
C15	No	Other	Large	Low	Low	State
C16	No	Other	Large	High	High	US, State
C17	No	Other	Medium	Low	High	State
C18	Yes	Other	Small	Low	Low	State, For
C19	No	Other	Medium	Low	Low	State
C20	Yes	High Tech	Large	Low	Low	State, For
C21	Yes	High Tech	Large	Low	Low	State, For
C22	No	High Tech	Medium	Low	Low	State
C23	Yes	Manufacturing	Medium	High	High	State, For
C24	Yes	Other	Medium	Low	High	State, For
C25	Yes	High Tech	Large	High	High	US, For[a]
C26	Yes	High Tech	Medium	High	Low	State, For
C27	Yes	Manufacturing	Medium	High	High	For
MEDIAN			**$11,490 M**	**20.41%**	**18.87%**	

This table shows information about the companies where the tax executive interviewees were employed at the time of the interview. MNE is "YES" if the company reports either non-missing pre-tax foreign income (PIFO) or foreign tax expense (TXFO or TXFED) in Compustat or if they are incorporated in a foreign country, "NO" otherwise. Industry is based on the Fama-French five industry groupings. Market Cap is share price at the end of the fiscal year (PRCC_F) times shares outstanding (CSHO). Medium companies have market capitalization between $1 billion and $10 billion USD and Large companies have market capitalization in excess of $10 billion. *GAAP ETR* is tax expense (TXT) scaled by pretax income (PI). *Cash ETR* is taxes paid (TXPD) scaled by pretax income. Low (High) values of ETRs are under (over) the U.S. statutory tax rate of 21%. Values are from companies' fiscal years ending in 2020 except for two companies that were acquired in 2019 and 2020 and for which we use fiscal 2018 and 2019 data, respectively. The final column indicates whether the company was under audit by the U.S., a U.S. state, or a foreign jurisdiction at the time of the interview.

[a] The state audit status of C25 was unclear from the interview.

TABLE 2: DESCRIPTIVE STATISTICS: SEMI-STRUCTED INTERVIEW SAMPLE

Company code	Credentials	Years of Tax Experience	Tax footnote in the financial statements	Other tax-related disclosures in the financial statements	Tax information in earnings announcements, press releases and conference calls
			Self-reported control over		
C1	CPA	10-19	95	95	95
C2	CPA	20-29	80	75	70
C3	CPA	20-29	90	75	90
C4	CPA	10-19	80	80	80
C5	J.D.	30-39	90	70	20
C6	CPA	40+	95	95	95
C7	CPA	10-19	100	100	100
C8	CPA, J.D.	30-39	90	20	80
C9	CFA	10-19	70	80	85
C10	##	30-39			
C11	CPA	30-39	100	82	58
C12	J.D.	10-19	90	90	90
C13	CPA	30-39	90	90	75
C14	##	30-39			
C15	CPA	30-39	95	95	95
C16	J.D. ##	30-39			
C17	CPA	30-39	100	100	100
C18	CPA	20-29	100	100	90
C19	CPA	20-29	90	80	70
C20	N/A	20-29	10	10	10
C21	CPA, J.D.##	20-29			
C22	##	30-39			
C23	CPA	20-29	98	95	90
C24	J.D.	10-19	90	80	60
C25	CPA, J.D.	30-39	100	100	100
C26	J.D.	30-39	100	100	100
C27	CPA	10-19	100	90	90
MEAN			**88.8%**	**81.9%**	**79.2%**

This table provides information about the tax executives we interviewed. We gathered information using a post-interview survey to which 22 interviewees who responded. ## denotes interviewees who did not respond to the survey. These five individuals had left the company where they were employed at the time of the interview, and we did not have updated contact information. For these five interviewees, we obtain information on their credentials and years of tax experience from publicly available data sources (e.g., LinkedIn), but we do not estimate the control these individuals had over their company's tax disclosures.

TABLE 3: SUMMARY OF INTERVIEWEES' RESPONSES

PANEL A: Do you think tax authorities get information from sources outside of the tax return (Answers sum to 100%)	
Yes	89%
No	7%
Ambiguous response	4%
PANEL B: Sources that interviewees believe tax authorities review (subset of the 89% from above)	
10-K/10-Q	92%
Earnings announcements, press releases, and conference calls	33%
News and media	33%
Other sources (e.g., board minutes, LinkedIn)	46%

This table summarizes interviewees' responses. The sample is 27 tax executives from corporations traded on U.S. exchanges. When providing percentages for "Sources that interviewees believe tax authorities review," we include only the 24 executives who responded "Yes" to the question of whether they think tax authorities get information from sources outside of the tax return.

TABLE 4: SAMPLE SELECTION

	Firm-year Observations
Observations of Publicly Traded U.S. firms in Compustat with fiscal years ending June 30, 2011 through September 30, 2021	43,768
Less: Observations missing tax footnote variables	(1,712)
Less: Observations missing data to compute required variables	(17,038)
Less: Observations with pre-tax income less than or equal to zero	(2,281)
Total firm-year observations for tests of equation (1):	**22,737**
Less: Observations missing I/B/E/S analyst forecast variables	(16,956)
Total firm-year observations for tests of equation (2):	**5,781**

This table describes the sample selection process. We define all variables in Appendix B.

TABLE 5: DESCRIPTIVE STATISTICS: VAGUENESS AND PROPRIETARY COSTS

Variable	Mean	Std Dev	P25	Median	P75
# of Obs. = 23,148					
Variables of Interest:					
Tax FN Vague Percent	2.2892	0.8822	1.7595	2.2889	2.8455
Tax FN Vague Count	17.285	12.507	8.000	15.000	23.000
GAAP ETR	-0.2149	0.4820	-0.3571	-0.2708	-0.1671
Cash ETR	-0.2496	0.3202	-0.3198	-0.2058	-0.0741
UTB Indicator	0.5544	0.4970	0.0000	1.0000	1.0000
Settle Indicator	0.2266	0.4186	0.0000	0.0000	0.0000
Footprint (Raw)	27.3051	19.1660	13.0000	22.0000	37.0000
Footprint	3.1153	0.6979	2.6391	3.1355	3.6376
Control Variables:					
Tax FN Non-Vague Count (Raw)	710.70	424.16	402.00	630.00	931.00
Tax FN Non-Vague Count	6.3755	0.6614	5.9989	6.4473	6.8373
Assets (Millions of dollars)	9,976.6	29,492.8	452.2	1,564.2	5,630.0
Assets	7.3309	2.0387	6.1141	7.3551	8.6359
ROA	0.0784	0.0815	0.0175	0.0551	0.1069
Leverage	0.2166	0.2431	0.0201	0.1390	0.3356
R&D Intensity	0.0231	0.0531	0.0000	0.0000	0.0133
Capital Intensity	0.2213	0.2600	0.0255	0.1152	0.3159
Intangible Intensity	0.0012	0.0039	0.0000	0.0000	0.0006
Change in NOL	-0.0025	0.0781	-0.0007	0.0000	0.0000
10-K Length	10.8581	0.4588	10.5789	10.8407	11.1242
APTS	8.1841	5.5841	0.0000	10.6028	12.4505
Auditor Tenure	2.4350	0.9235	1.7918	2.4849	3.0445

This table presents descriptive statistics for the variables used to estimate equation (1). We define all variables in Appendix B.

TABLE 6: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS
PANEL A: TAX FOOTNOTE VAGUENESS – *Tax FN Vague Percent*

DV =	pred.	(1)	(2)	(3)	(4)	(5)
				Tax FN Vague Percent		
GAAP ETR	(+)	0.040***				
		(3.33)				
Cash ETR	(+)		-0.003			
			(-0.14)			
UTB Indicator	(+)			0.057**		
				(1.72)		
Settle Indicator	(+)				0.087***	
					(3.68)	
Footprint	(+)					0.064**
						(2.32)
Assets		0.038***	0.037***	0.033***	0.030***	0.029***
		(4.09)	(4.05)	(3.48)	(3.17)	(2.76)
ROA		-0.339**	-0.350**	-0.367**	-0.380**	-0.372**
		(-2.17)	(-2.19)	(-2.34)	(-2.44)	(-2.38)
Leverage		0.031	0.035	0.031	0.035	0.027
		(0.62)	(0.69)	(0.61)	(0.69)	(0.54)
R&D Intensity		-0.463*	-0.437	-0.482*	-0.435	-0.429
		(-1.70)	(-1.61)	(-1.77)	(-1.60)	(-1.58)
Capital		-0.310***	-0.308***	-0.297***	-0.296***	-0.294***
		(-4.57)	(-4.53)	(-4.36)	(-4.37)	(-4.32)
Intangible		0.717	0.827	0.953	0.767	0.817
		(0.27)	(0.31)	(0.35)	(0.29)	(0.30)
Change in NOL		-0.203**	-0.212***	-0.219***	-0.215***	-0.219***
		(-2.50)	(-2.61)	(-2.69)	(-2.64)	(-2.68)
10-K Length		0.059**	0.060**	0.058**	0.064**	0.039
		(1.98)	(2.01)	(1.96)	(2.15)	(1.28)
APTS		0.004*	0.004*	0.004*	0.004	0.003
		(1.80)	(1.79)	(1.70)	(1.57)	(1.54)
Auditor Tenure		-0.029**	-0.029**	-0.032**	-0.031**	-0.032**
		(-2.01)	(-2.04)	(-2.19)	(-2.17)	(-2.20)
Adjusted R^2		0.0383	0.0378	0.0383	0.0390	0.0388

TABLE 6: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS (CONTINUED)
PANEL A: TAX FOOTNOTE VAGUENESS – *Tax FN Vague Count*

DV =	pred.	(1)	(2)	(3)	(4)	(5)
				Tax FN Vague Count		
GAAP ETR	(+)	0.011**				
		(2.23)				
Cash ETR	(+)		0.007			
			(0.73)			
UTB Indicator	(+)			-0.020		
				(-1.45)		
Settle Indicator	(+)				0.021**	
					(2.31)	
Footprint	(+)					0.022**
						(1.91)
Tax FN Non-Vague Count		1.053***	1.054***	1.057***	1.052***	1.051***
		(97.66)	(97.95)	(95.83)	(97.59)	(97.70)
Assets		0.007*	0.007*	0.008**	0.005	0.004
		(1.85)	(1.80)	(2.05)	(1.30)	(0.98)
ROA		-0.054	-0.064	-0.053	-0.066	-0.063
		(-0.89)	(-1.04)	(-0.87)	(-1.10)	(-1.04)
Leverage		0.005	0.006	0.007	0.006	0.003
		(0.22)	(0.28)	(0.35)	(0.29)	(0.16)
R&D Intensity		-0.274**	-0.270**	-0.259**	-0.264**	-0.255**
		(-2.56)	(-2.52)	(-2.41)	(-2.46)	(-2.38)
Capital		-0.106***	-0.106***	-0.108***	-0.103***	-0.101***
		(-3.75)	(-3.76)	(-3.85)	(-3.63)	(-3.55)
Intangible		0.922	0.953	0.889	0.925	0.938
		(0.89)	(0.91)	(0.85)	(0.89)	(0.90)
Change in NOL		-0.029	-0.029	-0.029	-0.032	-0.034
		(-0.83)	(-0.84)	(-0.83)	(-0.92)	(-0.97)
10-K Length		-0.003	-0.003	-0.004	-0.002	-0.009
		(-0.27)	(-0.26)	(-0.33)	(-0.16)	(-0.74)
APTS		0.002**	0.002**	0.002**	0.002**	0.002*
		(2.19)	(2.18)	(2.25)	(2.04)	(1.92)
Auditor Tenure		-0.011*	-0.011*	-0.010*	-0.011**	-0.012**
		(-1.87)	(-1.89)	(-1.74)	(-1.98)	(-2.06)
Psuedo R^2		0.497	0.497	0.497	0.497	0.497

This table presents the results of estimating equation (1). In Panel A (Panel B), we estimate equation (1) using an OLS regression (a fixed-effects Poisson model). Across all columns in both panels, the total number of observations is 22,737. The dependent variable in Panel A is *Tax FN Vague Percent*, which is the count of vague words and phrases in firm *i*'s tax footnote in year *t* divided by the count of total words in firm *i*'s tax footnote in year *t*. The dependent variable in Panel B is *Tax FN Vague Count*, which is the count of vague words and phrases in firm *i*'s tax footnote in year *t*. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. We define all other variables in Appendix B. All columns include year and Fama French 49 industry fixed effects, untabulated for parsimony, and standard errors clustered at the firm level. In Panel A (Panel B), values in parentheses represent t-statistics (z-statistics). ***, **, and * denote significance at the one-, five-, and ten-percent level using one-tailed tests (two-tailed tests) for variables of interest (for control variables).

TABLE 7: DESCRIPTIVE STATISTICS: VAGUENESS AND FORECAST ERRORS

			# of Obs. = 5,781		
Variable	**Mean**	**Std Dev**	**P25**	**Median**	**P75**
Variables of Interest:					
Tax Expense Forecast Error$_{t+1}$	0.0116	0.0201	0.0018	0.0049	0.0118
ETR Forecast Error $_{t+1}$	0.1271	0.3794	0.0099	0.0260	0.0768
ETR Forecast Error/Price $_{t+1}$	0.0103	0.0396	0.0002	0.0008	0.0032
Tax FN Vague Percent	2.3200	0.8380	1.7995	2.3313	2.8628
Tax FN Vague Count	18.940	12.127	10.000	17.000	25.000
Ln(Tax FN Vague Count)	2.7701	0.7554	2.3979	2.8904	3.2581
Control Variables:					
GAAP ETR	-0.2353	0.4521	-0.3665	-0.2950	-0.1939
UTB	0.0059	0.0097	0.0000	0.0022	0.0071
Assets	7.2991	1.5892	6.2044	7.2415	8.3263
Footprint	3.3546	0.5383	2.9957	3.3673	3.7377
Tax FN Non-Vague Count	0.0294	0.0498	0.0042	0.0117	0.0300
PTBI Forecast Error$_{t+1}$	0.4258	1.0831	0.0257	0.0873	0.2762
ETR Volatility	0.0920	0.1151	0.0243	0.0555	0.1132
Book-Tax Differences	0.2480	0.2408	0.0378	0.2046	0.3662
Leverage	2.9259	0.8836	2.3979	3.0445	3.5553
Firm Age	0.7450	0.2672	0.5150	0.8287	1.0000
Geographic Complexity	3.1911	48.9293	1.5516	2.4322	4.0624
Market-to-Book	0.1674	0.1660	0.0631	0.1198	0.2095
Sales Volatility	1.7622	0.8606	1.0986	1.7918	2.3979
Analyst Following	0.0880	0.0606	0.0443	0.0736	0.1161
Return Volatility	10.8376	0.4187	10.5540	10.7896	11.0754
10-K Length	6.5453	0.5427	6.2383	6.5751	6.9068
Tax FN Length	12.8363	2.3828	11.1500	12.6300	14.2400
Tax FN Fog	-0.2353	0.4521	-0.3665	-0.2950	-0.1939

This table presents descriptive statistics for the variables used to estimate equation (2). We define all variables in Appendix B.

TABLE 8: REGRESSION ANALYSIS: VAGUENESS AND FORECAST ERRORS
PANEL A: *Tax FN Vague Percent*

DV =	(1) *Tax Expense* *Forecast* *Error$_{t+1}$*	(2) *ETR* *Forecast* *Error$_{t+1}$*	(3) *ETR* *Forecast* *Error/Price$_{t+}$*
Tax FN Vague Percent	0.000	0.004	0.001
	(1.31)	(0.62)	(1.56)
GAAP ETR	0.000	0.029	0.003
	(0.07)	(1.47)	(1.18)
UTB	-0.036*	0.145	0.114
	(-1.67)	(0.21)	(1.20)
Assets	0.001***	-0.014**	-0.003***
	(2.61)	(-2.01)	(-4.46)
Footprint	-0.000	0.001	0.001
	(-1.06)	(0.07)	(0.56)
ETR Volatility	0.000*	0.025***	0.003***
	(1.66)	(3.41)	(3.67)
Book-Tax Differences	0.005	0.025	0.010
	(1.42)	(0.38)	(1.26)
Leverage	0.001	0.036	0.007**
	(1.40)	(1.25)	(2.27)
Firm Age	-0.001**	-0.016*	-0.001
	(-2.10)	(-1.93)	(-1.33)
Geographic Complexity	0.002	-0.008	0.002
	(1.31)	(-0.25)	(0.60)
Market-to-Book	-0.000	0.000	-0.000
	(-0.32)	(0.73)	(-0.06)
Sales Volatility	0.000	0.082*	0.010*
	(0.28)	(1.71)	(1.91)
Analyst Following	-0.002***	-0.041***	-0.005***
	(-3.90)	(-4.27)	(-4.96)
Return Volatility	0.002	0.212**	0.019*
	(0.56)	(2.03)	(1.68)
10-K Length	0.001**	0.070***	0.005***
	(2.14)	(3.99)	(3.19)
Tax FN Length	-0.001	0.017	0.002
	(-0.97)	(1.14)	(1.34)
Tax FN Fog	0.000	-0.000	0.000
	(0.47)	(-0.18)	(0.86)
PTBI Forecast Error$_{t+1}$	0.299***		
	(29.61)		
Adjusted R^2	0.591	0.0623	0.0797

TABLE 8: REGRESSION ANALYSIS: VAGUENESS AND FORECAST ERRORS (CONTINUED)
PANEL B: *Ln(Tax FN Vague Count)*

DV =	(1) Tax Expense Forecast Error_{t+1}	(2) ETR Forecast Error_{t+1}	(3) ETR Forecast Error/Price_{t+}
Ln(Tax FN Vague Count)	0.001*	0.012	0.002*
	(1.78)	(1.29)	(1.80)
GAAP ETR	0.000	0.029	0.003
	(0.07)	(1.47)	(1.18)
UTB	-0.036*	0.136	0.113
	(-1.69)	(0.20)	(1.19)
Assets	0.001***	-0.014**	-0.003***
	(2.62)	(-2.02)	(-4.46)
Footprint	-0.000	0.001	0.001
	(-1.07)	(0.06)	(0.56)
ETR Volatility	0.000*	0.025***	0.003***
	(1.65)	(3.39)	(3.66)
Book-Tax Differences	0.005	0.025	0.010
	(1.41)	(0.37)	(1.25)
Leverage	0.001	0.036	0.007**
	(1.41)	(1.26)	(2.27)
Firm Age	-0.001**	-0.016*	-0.001
	(-2.12)	(-1.94)	(-1.35)
Geographic Complexity	0.002	-0.007	0.002
	(1.33)	(-0.22)	(0.61)
Market-to-Book	-0.000	0.000	-0.000
	(-0.33)	(0.73)	(-0.07)
Sales Volatility	0.000	0.083*	0.010*
	(0.31)	(1.72)	(1.94)
Analyst Following	-0.002***	-0.041***	-0.005***
	(-3.91)	(-4.27)	(-4.97)
Return Volatility	0.002	0.212**	0.018*
	(0.56)	(2.03)	(1.67)
10-K Length	0.001**	0.070***	0.005***
	(2.11)	(3.97)	(3.15)
Tax FN Length	-0.001*	0.005	0.000
	(-1.73)	(0.32)	(0.24)
Tax FN Fog	0.000	-0.001	0.000
	(-1.60)	(0.31)	(0.32)
PTBI Forecast Error_{t+1}	0.299***		
	(29.61)		
R^2	0.591	0.0625	0.0798

TABLE 8: REGRESSION ANALYSIS: VAGUENESS AND FORECAST ERRORS (CONTINUED)

This table presents the results of estimating equation (2). Across all columns in both panels, the total number of observations is 5,781. In both panels, the dependent variable in column (1) is *Tax Expense Forecast Error*$_{t+1}$, which is the mean analyst forecast implied tax expense error for firm *i* in year *t+1* calculated as the absolute value of the difference between the implied I/B/E/S actual tax expense and the analyst consensus implied I/B/E/S tax expense forecast scaled by total shares outstanding and divided by the ending stock price for year *t*. In both panels, the dependent variable in column (2) is *ETR Forecast Error*$_{t+1}$, which is the mean analyst forecast implied ETR error for firm *i* in year *t+1* calculated as the absolute value of the difference between the implied I/B/E/S actual ETR and the analyst consensus implied I/B/E/S ETR forecast. In both panels, the dependent variable in column (3) is *ETR Forecast Error/Price*$_{t+1}$, which is *ETR Forecast Error*$_{t+1}$ scaled by price at the end of year *t*. We define all other variables in Appendix B. All columns include year and Fama French 49 industry fixed effects, untabulated for parsimony, and standard errors clustered at the firm level. Values in parentheses represent t-statistics. ***, **, and * denote significance at the one-, five-, and ten-percent level using two-tailed tests.

TABLE 9: REGRESSION ANALYSIS: VAGUENESS AND FORECAST ERRORS - ROBUSTNESS

DV	Forecast Period	Consensus Measure	Winsorizing	Tax FN Vague Percent coeff.	t-stat	Ln(Tax FN Vague Count) coeff.	t-stat
Tax Expense Forecast Error$_{t+1}$	60 days	Mean	1,99	0.000	(1.31)	0.001*	(1.78)
	60 days	Mean	5,95	0.000	(1.29)	0.000**	(1.99)
	60 days	Median	1,99	0.000	(1.23)	0.001*	(1.74)
	60 days	Median	5,95	0.000	(1.30)	0.000**	(1.97)
	90 days	Mean	1,99	0.000	(1.41)	0.001*	(1.92)
	90 days	Mean	5,95	0.000	(1.24)	0.000*	(1.90)
	90 days	Median	1,99	0.000	(1.32)	0.001*	(1.91)
	90 days	Median	5,95	0.000	(0.90)	0.000*	(1.70)
ETR Forecast Error$_{t+1}$	60 days	Mean	1,99	0.004	(0.62)	0.012	(1.29)
	60 days	Mean	5,95	-0.002	(-0.88)	0.001	(0.20)
	60 days	Median	1,99	0.004	(0.60)	0.011	(1.21)
	60 days	Median	5,95	-0.002	(-0.92)	0.000	(0.09)
	90 days	Mean	1,99	0.004	(0.68)	0.012	(1.31)
	90 days	Mean	5,95	-0.001	(-0.50)	0.001	(0.43)
	90 days	Median	1,99	0.004	(0.63)	0.010	(1.21)
	90 days	Median	5,95	-0.001	(-0.53)	0.001	(0.34)
ETR Forecast Error/Price$_{t+1}$	60 days	Mean	1,99	0.001	(1.56)	0.002*	(1.80)
	60 days	Mean	5,95	0.000	(0.13)	0.000	(0.80)
	60 days	Median	1,99	0.001*	(1.67)	0.002*	(1.86)
	60 days	Median	5,95	0.000	(0.17)	0.000	(0.80)
	90 days	Mean	1,99	0.001*	(1.65)	0.002*	(1.84)
	90 days	Mean	5,95	0.000	(0.24)	0.000	(0.87)
	90 days	Median	1,99	0.001*	(1.81)	0.002*	(1.96)
	90 days	Median	5,95	0.000	(0.22)	0.000	(0.81)
Number of specifications where p < 0.01 (p < 0.05) [p < 0.10]						0 (2) [15]	
Percentage of specifications where p < 0.01 (p < 0.05) [p < 0.10]						0.0% (6.3%) [31.3%]	

TABLE 9: REGRESSION ANALYSIS: VAGUENESS AND FORECAST ERRORS - ROBUSTNESS (CONTINUED)

This table presents coefficients and t-statistics for our variables of interest (i.e., *Tax FN Vague Percent* and *Ln(Tax FN Vague Count)*) for a series of robustness tests that vary the calculation of the dependent variable, *Tax Forecast Error$_{t+1}$*. Across all rows when the forecast period is 60 days (90 days), the total number of observations is 5,781 (6,445). The Forecast Period column indicates whether the calculation of *Tax Forecast Error$_{t+1}$* uses the first consensus analyst forecast issued during the first 60 days or 90 days following the issuance of the 10-K for year *t*. The Consensus Measure column indicates whether the calculation of *Tax Forecast Error$_{t+1}$* uses the mean or median consensus analyst forecast. The Winsorizing column indicates whether *Tax Forecast Error$_{t+1}$*, is winsorized at the 1st and 99th percentile or 5th and 95th percentile. All estimations include firm controls, year and Fama French 49 industry fixed effects, and standard errors clustered at the firm level. ***, **, and * denote significance at the one-, five-, and ten-percent level using two-tailed tests.

Online Appendix

How Tax Executives Craft Income Tax Disclosures in Response to Tax-Based Proprietary Costs

TABLE A1: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS

PANEL A: TAX FOOTNOTE VAGUENESS – *Tax FN Vague Percent*

DV =	pred.	(1)	(2)	(3)	(4)	(5)
				Tax FN Vague Percent		
GAAP ETR	(+)	0.043***				
		(3.59)				
Cash ETR	(+)	0.000				
		(0.02)				
UTB Indicator	(+)	0.033				
		(0.99)				
Settle Indicator	(+)	0.072***				
		(3.16)				
Footprint	(+)	0.056**				
		(1.99)				
TA GAAP – 3 yr.	(+)		0.022**			
			(2.18)			
TA Cash – 3 yr.	(+)			0.001		
				(0.31)		
UTB / Assets	(+)				2.657***	
					(2.34)	
Settle / Assets	(+)					28.129***
						(3.54)
Assets		0.021**	0.034***	0.035***	0.035***	0.035***
		(2.02)	(3.45)	(3.47)	(3.80)	(3.82)
ROA		-0.388**	-0.359**	-0.374**	-0.385**	-0.368**
		(-2.42)	(-2.14)	(-2.18)	(-2.46)	(-2.36)
Leverage		0.022	0.059	0.058	0.033	0.035
		(0.44)	(1.08)	(1.04)	(0.65)	(0.69)
R&D Intensity		-0.480*	-0.532*	-0.541*	-0.577**	-0.454*
		(-1.77)	(-1.83)	(-1.84)	(-2.09)	(-1.67)
Capital Intensity		-0.281***	-0.308***	-0.295***	-0.300***	-0.306***
		(-4.12)	(-4.22)	(-4.02)	(-4.42)	(-4.51)
Intangible Intensity		0.731	-1.609	-0.869	0.827	0.816
		(0.27)	(-0.52)	(-0.28)	(0.31)	(0.30)
Change in NOL		-0.216***	-0.201**	-0.172*	-0.213***	-0.216***
		(-2.67)	(-2.21)	(-1.80)	(-2.61)	(-2.65)
10-K Length		0.043	0.062**	0.061*	0.058*	0.061**
		(1.42)	(1.97)	(1.93)	(1.96)	(2.04)
APTS		0.003	0.005*	0.005*	0.004*	0.004*
		(1.35)	(1.91)	(1.93)	(1.73)	(1.72)
Auditor Tenure		-0.034**	-0.029*	-0.030*	-0.029**	-0.029**
		(-2.36)	(-1.86)	(-1.94)	(-2.06)	(-2.06)
Num. of Obs.		22,737	19,193	18,917	22,737	22,737
Adjusted R^2		0.0403	0.0376	0.0372	0.0379	0.0384

TABLE A1: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS (CONTINUED)

PANEL B: TAX FOOTNOTE VAGUENESS – *Tax FN Vague Count*

DV =	pred.	(1)	(2)	(3)	(4)	(5)
				Tax FN Vague Count		
GAAP ETR	(+)	0.011**				
		(2.20)				
Cash ETR	(+)	0.007				
		(0.74)				
UTB Indicator	(+)	-0.028				
		(-2.00)				
Settle Indicator	(+)	0.023***				
		(2.59)				
Footprint	(+)	0.024**				
		(2.02)				
TA GAAP – 3 yr.	(+)		0.004			
			(1.03)			
TA Cash – 3 yr.	(+)			0.001		
				(0.84)		
UTB / Assets	(+)				0.417	
					(0.94)	
Settle / Assets	(+)					6.186**
						(2.00)
Tax FN Non-Vague Count		1.054***	1.064***	1.063***	1.052***	1.053***
		(95.45)	(95.40)	(94.77)	(96.47)	(97.63)
Assets		0.003	0.005	0.005	0.007*	0.007*
		(0.76)	(1.16)	(1.22)	(1.76)	(1.70)
ROA		-0.065	-0.072	-0.071	-0.066	-0.063
		(-1.05)	(-1.12)	(-1.08)	(-1.09)	(-1.05)
Leverage		0.004	0.013	0.013	0.005	0.006
		(0.21)	(0.58)	(0.61)	(0.27)	(0.28)
R&D Intensity		-0.246**	-0.331***	-0.332***	-0.288***	-0.270**
		(-2.29)	(-2.97)	(-2.94)	(-2.66)	(-2.52)
Capital Intensity		-0.103***	-0.098***	-0.096***	-0.104***	-0.105***
		(-3.63)	(-3.25)	(-3.16)	(-3.68)	(-3.72)
Intangible Intensity		0.710	-0.160	0.093	0.969	0.962
		(0.68)	(-0.14)	(0.08)	(0.93)	(0.92)
Change in NOL		-0.029	-0.023	-0.008	-0.031	-0.033
		(-0.83)	(-0.61)	(-0.21)	(-0.88)	(-0.93)
10-K Length		-0.009	-0.004	-0.004	-0.003	-0.003
		(-0.73)	(-0.32)	(-0.35)	(-0.24)	(-0.23)
APTS		0.002*	0.002**	0.002**	0.002**	0.002**
		(1.88)	(2.26)	(2.24)	(2.15)	(2.12)
Auditor Tenure		-0.011*	-0.011*	-0.011*	-0.011*	-0.011*
		(-1.95)	(-1.86)	(-1.87)	(-1.89)	(-1.90)
Num. of Obs.		22,737	19,193	18,917	22,737	22,737
Psuedo R^2		0.498	0.504	0.503	0.497	0.497

TABLE A1: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS (CONTINUED)

This table presents the results of estimating equation (1). In Panel A (Panel B), we estimate equation (1) using an OLS regression (a fixed-effects Poisson model). The dependent variable in Panel A is *Tax FN Vague Percent*, which is the count of vague words and phrases in firm i's tax footnote in year t divided by the count of total words in firm i's tax footnote in year t. The dependent variable in Panel B is *Tax FN Vague Count*, which is the count of vague words and phrases in firm i's tax footnote in year t. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. *GAAP ETR* is equal to total tax expense (TXT) divided by pre-tax book income (PI) for firm i in year t. *Cash ETR* is equal to total cash taxes paid (TXPD) divided by pre-tax book income (PI) for firm i in year t. *UTB Indicator* is an indicator variable equal to one if firm i in year t reports a non-missing and non-zero value for ending uncertain tax benefits (TXTUBEND), and zero otherwise. *Settle Indicator* is an indicator variable equal to one if firm i in year t reports a non-missing and non-zero value for settlements related to uncertain tax benefits (TXTUBSETTLE), and zero otherwise. *Footprint* is equal to the natural log of one plus the number of unique states and countries mentioned in a firm i's 10-K in year t per 10-K textual data obtain from the Notre Dame Software Repository for Accounting and Finance website. *TA GAAP – 3 yr.* is the difference between firm i's mean industry size *GAAP ETR* and firm i's three-year *GAAP ETR* for years $t-2$ through year t. *TA Cash – 3 yr.* is the difference between firm i's mean industry size *Cash ETR* and firm i's three-year *Cash ETR* for years $t-2$ through year t. *UTB/Assets* is equal to firm i's ending uncertain tax benefits (TXTUBEND) divided by total assets (AT) in year t. *Settle/Assets* is equal to firm i's ending uncertain tax benefits (TXTUBSETTLE) divided by total assets (AT) in year t. *Assets* is equal to the natural log of firm i's total assets (AT) at the end of year t. *Tax FN Non-Vague Count* equals the natural log one plus the count of non-vague words in firm i's tax footnote in year t. *ROA* is equal to pre-tax book income (PI) divided by total assets (AT) for firm i in year t. *Leverage* is equal to total ending debt (DLTT) divided by lagged total assets (AT) for firm i in year t. *R&D Intensity* is equal to R&D expense (XRD) divided by total sales (SALE) for firm i in year t. Missing values of R&D expense are reset to zero. *Capital Intensity* is equal to net property, plant, and equipment divided by lagged total assets (AT) for firm i in year t. *Intangible Intensity* is equal to intangible assets (INTAN) divided by lagged total assets (AT) for firm i in year t. *Change in NOL* is equal to the difference between net operating losses (TLCF) between year t and year $t-1$, divided by lagged total assets (AT) for firm i. Missing values of net operating losses are reset to zero. *10-K Length* is equal to the natural log of one plus the count of the total number of words in firm i's 10-K in year t per data obtain from the Notre Dame Software Repository for Accounting and Finance website. *APTS* is equal to the natural log of one plus the dollar value of auditor provided tax services per Audit Analytics. *Auditor Tenure* is equal to the natural log of one plus the number of years firm i's current auditor has served as auditor per Audit Analytics. Tax footnote data is obtained from www.XBRLresearch.com. All columns include year and Fama French 49 industry fixed effects, untabulated for parsimony, and standard errors clustered at the firm level. In Panel A (Panel B), values in parentheses represent t-statistics (z-statistics). ***, **, and * denote significance at the one-, five-, and ten-percent level using one-tailed tests (two-tailed tests) for variables of interest (for control variables).

TABLE A2: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS

DV =	pred.	(1)	(2)	(3)	(4)	(5)
				Ln(Tax FN Vague Count)		
GAAP ETR	(+)	0.013**				
		(1.81)				
Cash ETR	(+)		-0.003			
			(-0.22)			
UTB Indicator	(+)			-0.007		
				(-0.46)		
Settle Indicator	(+)				0.032***	
					(2.71)	
Footprint	(+)					0.022**
						(1.69)
Tax FN Non-Vague Count		1.014***	1.015***	1.016***	1.013***	1.013***
		(74.19)	(74.41)	(72.15)	(74.04)	(73.57)
Assets		0.008*	0.008*	0.008*	0.005	0.005
		(1.81)	(1.78)	(1.85)	(1.16)	(1.06)
ROA		-0.132*	-0.134*	-0.134*	-0.147**	-0.144**
		(-1.86)	(-1.85)	(-1.88)	(-2.07)	(-2.01)
Leverage		0.009	0.010	0.011	0.010	0.008
		(0.38)	(0.42)	(0.44)	(0.42)	(0.32)
R&D Intensity		-0.321**	-0.313**	-0.310**	-0.311**	-0.309**
		(-2.50)	(-2.44)	(-2.39)	(-2.42)	(-2.40)
Capital		-0.149***	-0.148***	-0.150***	-0.145***	-0.144***
		(-4.45)	(-4.41)	(-4.43)	(-4.30)	(-4.27)
Intangible		2.469**	2.505**	2.482**	2.484**	2.503**
		(2.21)	(2.24)	(2.21)	(2.22)	(2.23)
Change in NOL		-0.070	-0.074*	-0.072*	-0.074*	-0.075*
		(-1.63)	(-1.70)	(-1.66)	(-1.71)	(-1.74)
10-K Length		-0.000	-0.000	-0.001	0.002	-0.007
		(-0.03)	(-0.02)	(-0.04)	(0.12)	(-0.47)
APTS		0.002	0.002	0.002	0.001	0.001
		(1.49)	(1.48)	(1.51)	(1.31)	(1.31)
Auditor Tenure		-0.010	-0.010	-0.010	-0.011	-0.011
		(-1.48)	(-1.49)	(-1.43)	(-1.60)	(-1.61)
Num. of Obs.		22,737	22,737	22,737	22,737	22,737
Adjusted R2		0.681	0.681	0.681	0.681	0.681

TABLE A2: REGRESSION ANALYSIS: VAGUENESS AND PROPRIETARY COSTS (CONTINUED)

This table presents the results of estimating equation (1). We estimate equation (1) using an OLS regression. The dependent variable is *Ln(Tax FN Vague Count)*, which is the natural log of one plus the count of vague words and phrases in firm *i*'s tax footnote in year *t*. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. *GAAP ETR* is equal to total tax expense (TXT) divided by pre-tax book income (PI) for firm *i* in year *t*. *Cash ETR* is equal to total cash taxes paid (TXPD) divided by pre-tax book income (PI) for firm *i* in year *t*. *UTB Indicator* is an indicator variable equal to one if firm *i* in year *t* reports a non-missing and non-zero value for ending uncertain tax benefits (TXTUBEND), and zero otherwise. *Settle Indicator* is an indicator variable equal to one if firm *i* in year *t* reports a non-missing and non-zero value for settlements related to uncertain tax benefits (TXTUBSETTLE), and zero otherwise. *Footprint* is equal to the natural log of one plus the number of unique states and countries mentioned in a firm *i*'s 10-K in year *t* per 10-K textual data obtain from the Notre Dame Software Repository for Accounting and Finance website. *Tax FN Non-Vague Count* equals the natural log one plus the count of non-vague words in firm *i*'s tax footnote in year *t*. *Assets* is equal to the natural log of firm *i*'s total assets (AT) at the end of year *t*. *ROA* is equal to pre-tax book income (PI) divided by total assets (AT) for firm *i* in year *t*. *Leverage* is equal to total ending debt (DLTT) divided by lagged total assets (AT) for firm *i* in year *t*. *R&D Intensity* is equal to R&D expense (XRD) divided by total sales (SALE) for firm *i* in year *t*. Missing values of R&D expense are reset to zero. *Capital Intensity* is equal to net property, plant, and equipment divided by lagged total assets (AT) for firm *i* in year *t*. *Intangible Intensity* is equal to intangible assets (INTAN) divided by lagged total assets (AT) for firm *i* in year *t*. *Change in NOL* is equal to the difference between net operating losses (TLCF) between year *t* and year *t-1*, divided by lagged total assets (AT) for firm *i*. Missing values of net operating losses are reset to zero. *10-K Length* is equal to the natural log of one plus the count of the total number of words in firm *i*'s 10-K in year *t* per data obtain from the Notre Dame Software Repository for Accounting and Finance website. *APTS* is equal to the natural log of one plus the dollar value of auditor provided tax services per Audit Analytics. *Auditor Tenure* is equal to the natural log of one plus the number of years firm *i*'s current auditor has served as auditor per Audit Analytics. Tax footnote data is obtained from www.XBRLresearch.com. All columns include year and Fama French 49 industry fixed effects, untabulated for parsimony, and standard errors clustered at the firm level. Values in parentheses represent t-statistics. ***, **, and * denote significance at the one-, five-, and ten-percent level using one-tailed tests (two-tailed tests) for variables of interest (for control variables).

TABLE A3: BOZANIC ET AL. [2017] REPLICATION AND EXTENSION

DV =	(1) *Tax FN Length*	(2) *Tax FN Length*	(3) *Tax FN Vague Percent*	(4) *Tax FN Vague Count*	(5) *Tax FN Non-Vague*
UTP Firm	0.071	0.104**	0.086	0.126**	0.103**
	(1.49)	(2.37)	(1.16)	(2.19)	(2.36)
UTP Disclosure Period	-0.021	0.078***	0.114***	0.168***	0.077***
	(-0.83)	(3.30)	(2.79)	(5.28)	(3.27)
UTP Firm * UTP Disclosure Period	0.259***	0.194***	-0.098	0.133**	0.195***
	(5.59)	(4.74)	(-1.40)	(2.48)	(4.79)
Assets	0.047***	0.054***	0.028***	0.064***	0.054***
	(7.43)	(10.41)	(3.02)	(8.88)	(10.41)
MNE	0.285***	0.289***	0.183***	0.351***	0.287***
	(13.15)	(15.63)	(5.47)	(13.90)	(15.61)
Market-to-Book	-0.000	-0.000***	-0.000	-0.000**	-0.000***
	(-0.35)	(-2.98)	(-0.23)	(-2.33)	(-3.01)
Leverage	0.019	0.030	0.054	0.064	0.029
	(0.47)	(0.99)	(1.03)	(1.56)	(0.97)
R&D Intensity	0.597***	0.530***	-0.720**	0.147	0.538***
	(3.22)	(3.22)	(-2.57)	(0.67)	(3.29)
Inventory Intensity	-0.017	0.007	0.025	0.018	0.007
	(-0.20)	(0.10)	(0.22)	(0.19)	(0.10)
Capital Intensity	-0.042	-0.107***	-0.275***	-0.249***	-0.104***
	(-0.87)	(-2.72)	(-3.99)	(-4.48)	(-2.67)
ROA	-0.608***	-0.518***	-0.500***	-0.719***	-0.513***
	(-5.27)	(-5.86)	(-3.01)	(-5.68)	(-5.85)
Change in NOL	-0.065	-0.103**	-0.269***	-0.242***	-0.100**
	(-0.99)	(-2.06)	(-3.14)	(-3.50)	(-2.01)
Cash	0.271***	0.218***	0.215***	0.304***	0.216***
	(4.97)	(4.82)	(2.68)	(4.97)	(4.80)
Sales Growth	0.021	0.040*	-0.016	0.008	0.041*
	(0.68)	(1.92)	(-0.44)	(0.26)	(1.94)
Intangible Intensity	3.294	3.471*	1.886	6.518***	3.456*
	(1.58)	(1.83)	(0.68)	(2.79)	(1.83)
10-K Length	0.323***	0.309***	0.051*	0.310***	0.309***
	(15.02)	(18.11)	(1.72)	(13.47)	(18.17)
Total # of Observations	9,514	22,132	22,132	22,132	22,132
Sample Period	2008-2014	2008-2021	2008-2021	2008-2021	2008-
Adjusted R^2	0.456	0.447	0.0382	0.449	0.449

Test of equivalence of UTP Firm * UTP Disclosure term across columns (4) and (5):

χ^2 Statistic				2.522	
P-Value				0.112	

This table presents the results of estimating the following equation, modeled after Bozanic et al. [2017]'s equation 4:

$$\textit{Tax FN Measure} = \beta_0 + \beta_1 \, \textit{UTP Firm} + \beta_2 \, \textit{UTP Disclosure Period} + \beta_3 \, \textit{UTP Firm} \times \textit{UTP Disclosure Period} + \Sigma\beta \, \textit{Controls} + \textit{Fixed Effects} + \varepsilon$$

The dependent variable in columns (1) and (2) is *Tax FN Length*, which is the natural log one plus the count of the total words in firm *i*'s tax footnote in year *t*. For fiscal years 2011 to 2021, we use footnote data obtained from www.XBRLresearch.com. For fiscal years 2008 through 2011, we obtain cleaned 10-K text files from the Notre Dame Software Repository for Accounting and Finance website and capture the text of the income tax footnote using common headers to the income tax footnote. The dependent variable in column (3) is *Tax FN Vague Percent*, which is the count of vague words and phrases in firm *i*'s tax footnote in year *t* divided by the count of total words in firm *i*'s tax footnote in year *t*. The dependent variable in column (4) is *Tax FN Vague Count*, which is the natural log of one plus the count of vague words and phrases in firm *i*'s tax footnote in year *t*. We identify vague words and phrases per Hiller's [2014] communication vagueness dictionary. The dependent variable in column (5) is *Tax FN Non-Vague Count*, which is the natural log one plus the count of non-vague words in firm *i*'s tax footnote in year *t*. *UTP Firm* is an indicator variable set equal to one for firms subject to Schedule UTP reporting requirements, and zero otherwise. A firm has a Schedule UTP reporting requirement if the firm had assets (AT) greater than $100 ($50) million in fiscal year 2010 (2012) and had a non-zero ending uncertain tax benefit (TXTUBEND) value. *UTB Disclosure Period* is an indicator variable set equal to one starting in fiscal year 2010 for firms with assets (AT) greater than $100 million, starting in fiscal year 2012 for firms with assets (AT) greater than $50 million, and starting in a random year between 2010 and 2013 for firms with less than $50 million in assets. *Assets* is equal to the natural log of firm *i*'s total assets (AT) at the end of year *t*. *MNE* is an indicator variable set equal to one for multinational firms, and zero otherwise. Multinational firms are identified as firms with non-missing and non-zero values for pre-tax foreign income (PIFO). *Market-to-Book* is equal to the ending market value of equity, calculated as the ending share price (PRCC_F) multiplied by the number of common shares outstanding (CSHO), divided by book value of equity (CEQ) for firm *i* in year *t*. *Leverage* is equal to the total ending debt (DLTT) divided by lagged total assets (AT) for firm *i* in year *t*. *R&D Intensity* is equal to R&D expense (XRD) divided by total sales (SALE) for firm *i* in year *t*. Missing values of R&D expense are reset to zero. *Inventory Intensity* is equal to inventory (INVT) divided by lagged total assets (AT) for firm *i* in year *t*. Missing values of inventory are reset to zero. *Capital Intensity* is equal to net property, plant, and equipment divided by lagged total assets (AT) for firm *i* in year *t*. *ROA* is equal to pre-tax book income (PI) divided by total assets (AT) for firm *i* in year *t*. *Change in NOL* is equal to the difference between net operating losses (TLCF) between year *t* and year *t-1*, divided by lagged total assets (AT) for firm *i*. Missing values of net operating losses are reset to zero. *Cash* is equal to cash holdings (CH) divided by lagged total assets (AT) for firm *i* in year *t*. *Sales Growth* is equal to the difference between total sales (SALE) between year *t* and year *t-1*, divided by total sales in year *t-1* for firm *i*. *Intangible Intensity* is equal to intangible assets (INTAN) divided by lagged total assets (AT) for firm *i* in year *t*. *10-K Length* is equal to the natural log of one plus the count of the total number of words in firm i in year t per data obtain from the Notre Dame Software Repository for Accounting and Finance website. All columns include Fama French 49 industry fixed effects, untabulated for parsimony, and standard errors clustered at the firm level. Values in parentheses represent t-statistics. ***, **, and * denote significance at the one-, five-, and ten-percent level using two-tailed tests.