

# The Trade-Off between Reporting Complexity and Proprietary Costs in Voluntary Disclosure Decisions: Evidence from Voluntary Tax Disclosures

Anne C. Ehinger  
Florida State University

Joshua A. Lee  
University of Georgia

Bridget Stomberg  
Indiana University

Erin Towery  
University of Georgia

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**ABSTRACT:** This study uses voluntary income tax disclosures as a setting to examine how managers trade off the relative costs and benefits of voluntary disclosure. We first provide evidence that income tax mentions in quarterly earnings announcements and during earnings conference calls are increasing in tax reporting complexity. These results are consistent with managers attempting to improve the overall quality of the information environment through enhanced voluntary disclosure. However, we also find that income tax mentions are decreasing in the likelihood of near-continuous IRS audit, suggesting that proprietary costs discourage managers from voluntarily disclosing tax information. When comparing the magnitude of each effect, we find that reporting complexity is a relatively more significant consideration in managers' voluntary tax disclosure decisions. Even for firms with the highest proprietary costs, we find no difference in the relation between tax reporting complexity and disclosure. This study furthers our understanding of the relative importance of various inputs to the voluntary disclosure decision and provides insight into the drivers of voluntary *income tax* disclosures – a previously underexplored yet important area as regulators and activists worldwide call for greater tax transparency.

**Keywords:** Income tax expense; tax reporting complexity; proprietary costs; voluntary disclosure

**JEL Codes:** H25, M41, M48

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Contact author: Anne Ehinger. Physical address: Florida State University, College of Business, 821 Academic Way, Tallahassee, FL 32306. Telephone: (850) 644-8209. Email address: [ahinger@business.fsu.edu](mailto:ahinger@business.fsu.edu).

## I. INTRODUCTION

We exploit voluntary income tax disclosures as a setting to examine how managers weigh the relative costs and benefits of disclosure. Voluntary disclosure is an important mechanism for reducing information asymmetry between managers and shareholders, particularly when mandatory financial statement disclosures are complex (Hodder, Hopkins and Wood 2008; You and Zhang 2009; Miller 2010; Lehavy, Li and Merkley 2011; Loughran and McDonald 2014; Guay, Samuels and Taylor 2016). Disclosure is costly, however, when it reveals proprietary information to third parties such as competitors, labor unions or regulators (Beyer, Cohen, Lys and Walther 2010). Despite the potential importance of multiple factors to managers' voluntary disclosure decisions, much existing literature focuses on one aspect of disclosure in isolation, which can lead to incorrect inferences if these aspects are related (Beyer et al. 2010). Income taxes offer a powerful setting to address how both reporting complexity and proprietary costs interrelate to influence managers' voluntary disclosure decisions.

Managers have private information about firms' income taxes that is valuable to both investors and tax authorities. Financial reporting for income taxes is complex and some stakeholders believe mandatory financial statement disclosures are insufficient to communicate how well current-period taxes predict future tax cash flows (FASB 2016). Thus, consistent with prior findings that managers increase earnings guidance to mitigate the negative effects of overall financial reporting complexity (Hodder et al. 2008; You and Zhang 2009; Miller 2010; Lehavy et al. 2011; Loughran and McDonald 2014; Guay et al. 2016), we expect firms with greater tax reporting complexity provide more voluntary income tax disclosures to benefit shareholders.

However, income tax disclosures can also reveal proprietary information to tax authorities about areas of noncompliance or potentially aggressive tax avoidance. Adopting the framework from Wagenhofer (1990), proprietary costs are salient in voluntary income tax disclosures because

revealing private information to tax authorities, potential adversaries to the firm, can reduce firms' future cash flows. Bozanic, Hoopes, Thornock and Williams (2017) provide evidence that firms' financial statement tax disclosures are informative to tax authorities and other studies suggest that managers act strategically when publicly disclosing information not already available to the IRS in tax filings (e.g., Hope, Ma and Thomas 2013).<sup>1</sup> Even if firms' voluntary tax disclosures are not informative to tax authorities, managers' perceptions about whether these disclosures inform tax authorities could nonetheless affect their disclosure decisions (Dedman and Lennox 2009). Managers must therefore weigh the benefits of making voluntary tax disclosures to mitigate the negative effects of tax reporting complexity with the potential costs of revealing sensitive information to tax authorities.

We measure the supply of voluntary income tax disclosure using income tax mentions in 30,000 quarterly earnings announcements and conference calls from 2002 to 2015. We focus on earnings announcements and conference calls because prior research documents that firms use these disclosure mediums to provide new information to market participants (e.g., Tasker 1998; Frankel, Johnson and Skinner 1999; Bowen, Davis and Matsumoto 2002; Matsumoto, Pronk and Roelofsen 2011; Brown, Call, Clement and Sharp 2018). Indeed, earnings announcements and conference calls are the most important voluntary disclosures coinciding with earnings news (Li and Ramesh 2009). Conference calls, in particular, are a unique forum for voluntary disclosure because their interactive nature allows us to observe not only managers' supply of voluntary tax disclosures, but also analysts' demand for additional tax information.

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<sup>1</sup> Voluntary income tax disclosures also potentially provide information to a firm's competitors about their tax planning strategies. We do not focus on proprietary costs with respect to competitors because (i) empirical proxies for firm competition are unreliable and provide mixed evidence in other settings, and (ii) competitors can gather information about tax planning strategies directly from external tax consultants because tax planning is generally not subject to confidentiality agreements. We view our focus on proprietary costs related to tax authorities as a primary benefit of our setting. Doing so allows us to directly measure variation in proprietary costs of disclosure without using unreliable measures of product market competition (e.g., Herfindahl index).

We begin by analyzing the frequency and content of income tax mentions in earnings announcements and conference calls. Doing so allows us to provide new descriptive evidence on the tax topics most frequently mentioned in voluntary disclosures. We document that 89 percent of firm-quarters contain a mention of income taxes by management in the conference call and/or the earnings announcement. The frequency of these mentions is relatively constant across quarters, and management often mentions income taxes during every quarter of the year. Approximately 73 (45) percent of conference calls (earnings announcements) with management income tax mentions include forward looking tax information, approximately 68 (55) percent include historical and operational tax expense information, and approximately 54 (36) percent include a comparison of current-period taxes to a prior period.<sup>2</sup> Analysts initiate tax-related questions during 27 percent of conference calls, and those questions most often relate to forward looking tax information, historical and operational tax expense information, and comparisons of current-period taxes to a prior period.

We next examine the number and length of income tax mentions in conference calls and earnings announcements as a function of the potential costs and benefits of disclosure. Voluntary tax disclosures are more beneficial to the firm when information is more complex. Following Bratten, Gleason, Larocque, and Mills (2017), we use principal component analysis to extract a single factor from three proxies for tax reporting complexity: the volatility of a firm's effective tax rate (ETR) over time, the firm's ETR surprise, and the magnitude of the firm's permanent tax avoidance. We expect each of these factors makes it more difficult for market participants to forecast future income tax cash flows and therefore increases managers' incentives to provide

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<sup>2</sup> We developed an initial algorithm to classify income tax mentions into sub-topics based on key words we identified after reading quarterly earnings conference call transcripts from 2012 for a sample of the 100 largest and 100 smallest firms that host earnings conference calls. We further refined the algorithm by reading additional tax mentions from our sample. See Appendix B for our final classification algorithm.

voluntary tax disclosures. On the other hand, voluntary tax disclosures are more costly when a firm faces greater IRS scrutiny. We measure the proprietary costs of voluntary tax disclosure using an estimate of whether the firm is part of the IRS' Coordinated Industry Case (CIC) program (Ayers, Seidman and Towery 2018). CIC firms are under near-continual IRS audit, and IRS auditors devote between six and 10 times as many hours on audits of CIC firms relative to non-CIC firms (Ayers et al. 2018). Thus, we expect CIC firms face the highest proprietary costs of voluntary tax disclosure because they face the greatest scrutiny from the IRS.

As expected, we find a positive association between reporting complexity and voluntary disclosure, and a negative association between proprietary costs and voluntary disclosure. A one standard deviation increase in tax reporting complexity increases the number (length) of tax mentions by 15 (14) percent. In contrast, a one standard deviation increase in CIC score decreases the number (length) of tax mentions by 7.5 (8.6) percent. Comparing the relative magnitude of these effects, we find that tax reporting complexity has a significantly larger association with the number of tax mentions; the difference is marginally significant for the length of tax mentions. Thus, it appears the effects of reporting complexity are relatively more important than the effects of proprietary costs in managers' decisions about tax mentions in earnings announcements and conference calls, on average. We also examine whether the effect of tax reporting complexity on voluntary tax mentions holds for firms facing the highest level of proprietary costs. We find no difference in the relation between tax reporting complexity and the amount of voluntary tax disclosure for firms with the highest proprietary costs. These results collectively suggest reporting complexity is a relatively more important determinant of voluntary tax disclosures, even for firms facing high proprietary costs.

We next exploit the richness of our data to understand which factor(s) influences the likelihood of specific tax disclosures. We find that tax reporting complexity and proprietary costs influence selected disclosure topics in expected ways. Tax reporting complexity has a stronger association with managers' decisions to disclose forward looking information and information about valuation allowances, deferred taxes, losses, state, local and foreign tax issues, and current or historical operations. In contrast, proprietary costs dominate managers' decisions to mention persistent tax planning strategies and reserves for uncertain tax positions. These results speak to the relative importance of proprietary costs and reporting complexity on different types of voluntary income tax disclosure. Managers are more likely to disclose a particular item when the item is likely to inform investors about future performance and unlikely to inform the IRS about potential areas of noncompliance (e.g., valuation allowances). Conversely, managers are less likely to disclose information that could be relatively more beneficial to the IRS.

Our study contributes to two streams of literature. We extend the voluntary disclosure literature in three ways. First, by jointly examining the effects of reporting complexity and proprietary costs, our study addresses the concern in Beyer et al. (2010) that most studies focus on only one aspect of disclosure in isolation (e.g., reporting complexity *or* proprietary costs), which can lead to incorrect inferences to the extent that these aspects are related. Second, because we focus on conference calls and earnings announcements, which are strictly voluntary, our setting is not subject to the limitation of examining disclosures such as the MD&A that contain both mandatory and voluntary disclosures. Finally, despite theoretical work predicting that proprietary costs reduce voluntary disclosure (e.g., Verrecchia 1983; Dye 1985; Darrough and Stoughton 1990; Wagenhofer 1990; Gigler 1994), empirical evidence of a connection between management earnings forecasts and product market competition as a measure of proprietary costs is mixed (e.g.,

Ajinkya, Bhojraj and Sengupta 2005; Wang 2007). These inconclusive empirical findings could be attributable to several research design limitations including weak measures of proprietary costs, voluntary disclosure, or both. One of our contributions is measuring cross-sectional variation in proprietary costs in a way that does not rely on measures of product market competition that often exploit industry structure to estimate variation (Li, Lin, and Zhang 2018).

We also advance the literature examining managers' voluntary disclosures of tax information. Whereas other studies focus on specific types of voluntary tax disclosures such as uncertain tax avoidance (Bozanic et al. 2017), book-tax differences (Schwab 2009), ETR decreases (McGuire 2009), and ETR forecasts (Chen, Chi and Shevlin 2018; Koutney 2018; Green 2013), we select search terms that capture a broad spectrum of income tax issues. In doing so, we identify the specific topics of voluntary tax disclosures and provide some of the first large sample descriptive evidence on the income tax issues management views as important. Our use of conference call data also allows us to provide evidence of which tax topics analysts view as important. Exploring a wide variety of income tax disclosures across multiple disclosure mediums is important given the increased visibility and scrutiny of corporate income tax in the U.S. and global calls for increased tax transparency. We are also among the first studies in this literature to consider the effects of multiple factors that influence voluntary tax disclosures. Although prior studies consider the effect of managers' incentives on tax disclosures in isolation (e.g., Balakrishnan, Blouin and Guay 2018; Bozanic et al. 2017; McGuire 2009; Robinson and Schmidt 2013), we jointly consider the effects of tax reporting complexity and proprietary costs.

Despite the strengths of our setting, limitations remain. First, because we focus on a measure of proprietary costs with respect to tax authorities, which are but one adversarial party to the firm, it is not clear that our results generalize to other adversarial parties such as competitors.

Second, we may measure proprietary cost with error. We attempt to address this issue by using multiple measures of proprietary costs – each with their own strengths and limitations – and continue to find consistent results, which provides comfort that our inferences are robust. However, we look forward to future research that continues to develop innovative ways to measure these costs. Nonetheless, we believe our study takes an important step in furthering our understanding of the cost-benefit trade-off in voluntary disclosure decisions.

## **II. BACKGROUND & RELATED LITERATURE**

Our study explores the relative importance of financial reporting complexity and proprietary costs on firms' voluntary disclosure decisions. In the following subsections, we first summarize studies that examine the effect of each factor on firms' broad voluntary disclosure decisions and studies that examine the effect of each factor on voluntary income tax disclosure decisions specifically. We then discuss the trade-off between financial reporting complexity and proprietary costs in the tax setting.

### *Financial reporting complexity and voluntary disclosure*

A substantial literature documents that financial reporting complexity can impair a firm's information environment and increase users' information processing costs (e.g., Hodder et al. 2008; You and Zhang 2009; Miller 2010; Lehavy et al. 2011). Theoretical research predicts increased disclosure can reduce market participants' information processing costs and lead to more precise estimates of future performance (e.g., Grossman and Stiglitz 1980; Kim and Verrecchia 1991). Empirical evidence also suggests firms with more informative disclosures have greater analyst following, more accurate analyst forecasts, less disperse analyst forecasts, and less volatility in analyst forecast revisions (Lang and Lundholm 1996). Thus, more informative disclosures can lead to reduced estimation risk and information asymmetry, both of which can

affect a firm's cost of capital. As such, managers of firms with more complex financial reporting have greater incentives to enhance their disclosure environment. Consistent with this prediction, studies find that financial reporting complexity is associated with greater voluntary disclosure. For example, Guay et al. (2016) provide evidence that financial reporting complexity is associated with increased management forecasts.<sup>3</sup>

Income taxes are a material component of firms' earnings and cash flows, but are notoriously difficult for financial statement users to comprehend because accounting for income tax reporting is complex. Even when mandatory disclosures provide financial statement users with the information necessary to process tax effects, evidence suggests they fail to do so. For example, Chen and Schoderbek (2000) find that analysts did not incorporate the effect of tax rate changes on deferred tax balances arising from the passage of the Omnibus Budget Reconciliation Act of 1993 into their forecasts despite having all of the required information; even more sophisticated analysts did not impound the information. Thus, we expect the potential for reduced information quality and/or higher information processing costs increases with income tax reporting complexity. In this case, managers have an incentive to increase tax disclosures to mitigate the negative effects of tax reporting complexity on the firm's information environment.

Indeed, prior studies offer evidence that analysts' forecast errors are associated with tax reporting complexity and the quality of the firm's information environment. Although Weber (2009) provides evidence that tax-based forecast errors decrease with analyst following (a proxy for firms' external information environments), Kim, Schmidt, and Wentland (2017) extend these results and find that analysts underreact to the tax change component of earnings to a greater extent

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<sup>3</sup> In related studies, Coller and Yohn (1997) and Billings, Jennings, and Lev (2015) find a positive relation between market-based measures of uncertainty and management forecasts. These results could suggest that managers increase voluntary disclosures (in the form of earnings announcements) in response to investor uncertainty.

than other earnings components when information processing costs are high. McGuire (2009) provides evidence that analysts' one-year-ahead earnings estimates are less accurate when a greater part of net earnings is related to a reduction in taxes, but he also provides evidence that this inaccuracy is mitigated when firms explain the reasons for the ETR decreases in their earnings announcements. Focusing on conference calls, Schwab (2009) finds that disclosures related to book-tax differences are more likely for firms with large book-tax differences, firms with greater tax avoidance, and firms with low earnings quality, all of which could signal greater tax reporting complexity. Balakrishnan et al. (2018) provide evidence that managers at tax aggressive firms attempt to mitigate the negative consequences of *overall* financial reporting opacity by increasing tax disclosures in the MD&A and conference calls. Similarly, Chen et al. (2018) provide evidence that managers are more likely to provide ETR forecasts when they face greater *operational* complexity, but not when they face greater tax reporting complexity. Finally, Bratten et al. (2017) provide evidence that discrete income tax items recorded during the quarter reduce the informativeness of the quarterly ETR as a forecast of the annual ETR. Their results suggest analysts gather additional information from management to understand how quarterly discrete items affect the annual ETR and, through this channel, analysts achieve greater forecast accuracy relative to the year-to-date ETR.

In sum, most existing empirical studies suggest that market participants struggle to comprehend income tax reporting and its effect on earnings, which creates uncertainty for market participants. Theoretical papers on voluntary disclosure predict that an increase in market participants' uncertainty about the implications of current earnings for firm value leads to increased voluntary disclosures by management (Jung and Kwon 1988; Verrecchia 1990). Thus, we expect greater income tax reporting complexity is associated with more voluntary income tax

disclosures.<sup>4</sup>

### *Proprietary costs and voluntary disclosure*

Analytical studies derive conditions under which managers will voluntarily disclose information (e.g., Grossman and Hart 1980), and among the most important conditions is that disclosure is costless. This stream of literature consistently predicts that proprietary costs reduce managers' incentives to voluntarily disclose information (Verrecchia 1983; Wagenhofer 1990). Disclosures of proprietary information are costly when they reveal information to potentially adversarial parties such as competitors, labor unions, or regulators (Beyer et al. 2010) that reduces the disclosing firm's future cash flows. However, empirical evidence of the effect of proprietary costs on voluntary disclosure decisions is mixed. For example, although Bamber and Cheon (1998) report that firms facing less industry competition provide fewer voluntary disclosures, Verrecchia and Weber (2006) find that firms facing greater industry competition are more likely to redact information. Beyer et al. (2010) attributes the mixed evidence to the difficulty in measuring and quantifying proprietary costs. As Li et al. (2018) explain, researchers cannot directly observe proprietary costs and instead rely on measures of product market competition (i.e., industry structure) to measure variation in proprietary costs. However, the relation between industry structure and proprietary costs is ambiguous (e.g., Darrough and Stoughton 1990) and researchers often measure industry structure with error (e.g., Ali, Klasa, and Yeung 2008). Thus, although the theoretical relation between proprietary costs and voluntary disclosure seems clear, empirical evidence in support of theoretical predictions is limited.

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<sup>4</sup> An alternative to voluntarily providing income tax information in earnings announcements and conference calls when faced with tax reporting complexity is modifying financial statement disclosures. For example, Hutchens (2018) provides evidence that managers' discretionary use of jargon in the tax footnote decreases analyst forecast accuracy, while managers' discretionary use of quantitative information in the tax footnote increases analyst forecast accuracy.

Voluntary income tax disclosures offer an alternative way to measure the effects of proprietary costs (i.e., without relying on industry structure). Revealing proprietary information to tax authorities can increase the firm's risk of being audited or increase the likelihood of the tax authority targeting a specific position for firms already subject to audit, both of which are potentially costly to the firm because they can reduce future cash flows. Bozanic et al. (2017) provide evidence that firms' public disclosures are useful to the IRS. Even if tax authorities do not find voluntary tax disclosures informative, managers might still withhold tax information if they perceive these costs are real.

Yet research examining the effect of proprietary costs on voluntary tax disclosures is somewhat limited. Using low effective tax rates as a proxy for high proprietary costs, Robinson and Schmidt (2013) report that firms provide lower quality mandatory disclosures for uncertain tax positions in their financial statements when proprietary costs are higher, and McGuire (2009) finds that managers are less likely to explain their fourth quarter ETR decreases in earnings announcements when the costs of proprietary disclosure are greater. In a more recent study, Bozanic et al. (2017) provide evidence that firms increased the quantity of tax footnote disclosures after the introduction of Schedule UTP, consistent with managers increasing public disclosures in response to a likely reduction in proprietary costs.<sup>5</sup> In sum, unlike studies using product market competition as a measure of proprietary costs, studies examining tax proprietary costs consistently generate results consistent with theoretical predictions. Drawing on these studies, we expect firms to voluntarily disclose less tax information when proprietary costs of revealing information to the tax authorities are higher.

#### *Trade-off between financial reporting complexity and proprietary costs*

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<sup>5</sup>Schedule UTP requires firms to privately disclose information about uncertain tax positions to the IRS on their federal tax return, which potentially reduces the tax-related proprietary costs of public disclosure.

As Beyer et al. (2010) note, “most empirical research does not fully incorporate all of the costs and benefits of voluntary disclosures. Rather, the literature focuses on one aspect at a time” (p. 314). As such, a finding that reporting complexity in isolation is associated with increased disclosure may not hold when disclosure *costs* are considered, and vice versa. More importantly, failing to consider multiple factors simultaneously inhibits our understanding of the relative importance of each factor. To that end, Beyer et al. (2010) call for additional research to understand the importance of proprietary costs in managers’ voluntary disclosure decisions *relative* to other factors. Our study answers this call by considering the relative importance of reporting complexity and proprietary costs in managers’ voluntary income tax disclosure decisions. We examine how managers trade off the costs and benefits of voluntary tax disclosure.

Although managers have incentives to voluntarily disclose information about income taxes to reduce market participants’ uncertainty about the implications of tax expense for firm value, the proprietary costs of disclosing income tax information could reduce a manager’s incentives to disclose. Specifically, to the extent tax disclosures intended to help reduce information uncertainty among market participants also likely help tax authorities with issue identification, managers have less incentive to voluntarily disclose. For example, disclosing the implementation of a persistent tax strategy is helpful to investors in forecasting future tax cash flows, but could also be of interest to tax authorities because more persistent tax avoidance strategies result in a more persistent loss in tax revenue; all else equal, tax authorities would rather challenge persistent tax avoidance strategies than transitory ones. Indeed, in response to the FASB’s recent proposal to require country-level tax disclosures, stakeholders expressed concern that this level of additional detail would allow tax authorities to collect additional taxes from companies (FASB 2016). We therefore

expect managers to modify their voluntary disclosure decisions when faced with higher proprietary costs.

In sum, voluntary income tax disclosures provide a powerful setting to examine how managers trade off the benefits of voluntary disclosure (reducing the adverse effects of reporting complexity) and the costs of voluntary disclosure (revealing proprietary information to tax authorities). Because we know of no theoretical studies that derive predictions on the relative importance of these competing forces, we make no formal prediction about whether reporting complexity or proprietary costs dominates managers' voluntary tax disclosure decision.

### **III. RESEARCH DESIGN**

#### *Sample selection*

We focus on earnings announcements and conference calls because they are widely used forms of corporate voluntary disclosure. Firms generally first release earnings announcements and then follow up with conference calls to provide additional information about operating results. Conference calls typically last approximately one hour and include two components: (i) a presentation by management of operating results (the presentation segment); and (ii) a question and answer session with call participants (the discussion segment). Each type of voluntary disclosure is incrementally informative with respect to earnings news. Li and Ramesh (2009) conclude that investors use the earnings announcement as a source of information in place of Form 10-Q. Matsumoto et al. (2011) provide evidence that both the presentation and discussion segments of conference calls are informative incremental to the earnings announcement. Further, the discussion segment provides information incremental to the presentation segment (Matsumoto et al. 2011). Benefits of voluntary disclosure around quarterly earnings releases include reduced

information asymmetry, reduced cost of capital (Brown, Hillegeist, and Lo 2004), timely interpretation of results (Frankel et al. 1999), reduced serial correlation in analyst forecast errors, and reduced post-earnings-announcement drift (Kimbrough 2005).

To construct our sample, we begin with all non-financial firms on Compustat between 2002 and 2015 with non-missing total assets. We match these firms to their unique Factiva identifiers using the company name provided by Compustat to obtain transcripts for conference calls held between Q1 2002 and Q4 2015. We then search Factiva's FD Wire using these unique identifiers for all earnings conference calls. We obtain earnings announcements from EDGAR. We require firms to have both a quarterly conference call transcript on Factiva and a quarterly earnings announcement on EDGAR. We also require firms to have current year and prior year data available in Compustat to be included in our initial sample. These criteria result in an initial sample of 43,813 firm-quarter observations for 2,499 unique firms.

[Insert Table 1 here]

Table 1 Panel A summarizes our sample selection. We remove 13,040 firm-quarter observations missing information necessary to calculate required variables. Consistent with much tax research, we remove 715 firm-quarter observations with negative pre-tax income or negative tax expense (e.g. Rego and Wilson 2012; Balakrishnan et al. 2018). We also remove 58 firm-quarter observations for tax preparation firms (e.g., H&R Block) and Automatic Data Processing (ADP) because a review of their conference call transcripts reveals that the vast majority of their income tax mentions relate to their underlying business model (e.g., increases in sales during tax filing season, transmission of payroll taxes to the IRS, etc.) rather than to their own income taxes. These criteria result in a final sample of 30,000 firm-quarter observations with both an earnings press release and an earnings conference call for 1,805 unique firms.

Table 1 Panel B provides the composition of our sample by industry using the Fama and French 12-industry classification. Firms in the business equipment industry make up 21.5 percent of the sample, followed by 14.5 percent in the wholesale, retail, and some services industry, and 14.4 percent in the manufacturing industry. This industry composition is similar to the general distribution of industries for the full sample of firms with conference call data available from Factiva (untabulated). Thus, our sample selection criteria do not alter the industry make-up of firms covered by Factiva.

*Tax reporting complexity, proprietary costs, and voluntary disclosure*

We identify voluntary income tax disclosure through textual analysis. We initially read conference call transcripts held in 2012 for a sample of the 100 largest and 100 smallest firms that host earning conference calls to identify common words and phrases used to discuss income taxes. We then used these keywords to identify income tax mentions across our entire sample of conference calls and earnings announcements, and iteratively modified the keywords based on reading additional random samples of disclosures. We also used these keywords to develop an algorithm to classify income tax mentions into sub-topics. Appendix B provides our final classification algorithm. We find that 89 percent of all firm-quarter observations in our sample have at least one income tax mention in the conference call or earnings announcement. Because of the low variation in the likelihood of an income tax mention, we focus our analysis on the amount of voluntary tax disclosures.

We measure the amount of voluntary tax disclosure in multiple ways.  $\text{Log}(\text{Mention Count})$  is the natural log of the count of total tax mentions,  $\text{Log}(\text{CC Mention Count})$  is the natural log of one plus the count of conference call tax mentions, and  $\text{Log}(\text{EA Mention Count})$  is the natural log of one plus the count of earnings announcement tax mentions. Similarly,  $\text{Log}(\text{Mention Length})$  is

the natural log of one plus the number of words from sentences containing a tax mention,  $\text{Log}(CC \text{ Mention Length})$  is the natural log of one plus the number of words from sentences containing a tax mention in the conference call, and  $\text{Log}(EA \text{ Mention Length})$  is the natural log of one plus the number of words from sentences containing a tax mention in the earnings announcement.

To test our research question about managers' trade-off between the costs and benefits of voluntary disclosure we use OLS regressions to examine whether firms with greater tax reporting complexity (proprietary costs) increase (decrease) the amount of income tax information voluntarily disclosed:

$$\text{Disclosure Amount} = \beta_0 + \beta_1 \text{Tax Complexity} + \beta_2 \text{CIC Score} + \beta_{3-7} \text{General Complexity} + \beta_{8-9} \text{Information Environment} + \text{Quarter FE} + \text{Industry FE} + \varepsilon \quad (1)$$

Following Bratten et al. (2017), we use principal component analysis to develop a continuous annual measure of tax reporting complexity (*Tax Complexity*). This composite measure is based on three underlying ETR variables: permanent book-tax differences in  $t-1$ , ETR surprises from  $q-5$  to  $q-1$ , and quarterly ETR volatility in  $t-1$ , each of which increases the difficulty of predicting future tax expense for analysts and investors (Bratten et al. 2017). We therefore predict each of these factors increases management's incentives to provide voluntary income tax disclosures in an effort to increase market participants' understanding of the effect of taxes on earnings. Indeed, in untabulated analysis, we find that analysts' propensity to ask income tax questions during the Q&A segment of conference calls is increasing in our measure of tax rate complexity, and that voluntary income tax mentions improve ETR forecast accuracy. All three inputs to the principal component analysis are positively correlated and we find in untabulated analysis that inferences herein are largely unchanged if we use each input in place of *Tax Complexity*. Consistent with prior theoretical and empirical work, we expect more voluntary income tax disclosure for firms with greater tax reporting complexity ( $\beta_1 > 0$ ).

Using the model from Ayers et al. (2018), we create a continuous measure of the likelihood that a firm is part of the IRS' Coordinated Industry Case (CIC) program (*CIC Score*). These firms face high tax authority scrutiny because they are under near-continuous audit by the IRS and because the IRS spends significantly more time auditing CIC firms than non-CIC firms. Ayers et al. (2018) report the interquartile range of audit hours for CIC firms is 668 to 3,031 hours versus only 62 to 525 hours for non-CIC firms. Additionally, anecdotal evidence suggests IRS agents spend such a substantial amount of time at CIC taxpayers' offices that they often have an office space permanently designated to them. The fact that these agents are on-site almost continuously likely heightens management's awareness of issues related to the income tax audit and increases the salience of proprietary costs.<sup>6</sup>

Consistent with prior theoretical work in the disclosure literature, we predict less voluntary income tax disclosure for firms facing greater proprietary costs ( $\beta_2 < 0$ ). However, if the information voluntarily disclosed in quarterly filings will eventually be disclosed to the IRS, either in subsequent public filings or the tax return, then we would expect no significant association between *CIC Score* and voluntary disclosures. Similarly, if for some reason firms in the CIC program believe they face lower proprietary costs because the IRS is already heavily scrutinizing them, then we would also not expect a negative relation between *CIC Score* and voluntary

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<sup>6</sup> Other studies examining proprietary costs of tax disclosure often use the level of the ETR as a proxy for proprietary costs with the assumption that lower ETRs are associated with higher disclosure costs. We instead use *CIC Score* because our research question requires a measure of proprietary costs that is largely uncorrelated with our measure of tax reporting complexity so that we can more cleanly measure each separate construct. We find the Pearson correlation between *CIC Score* and *Tax Complexity* is only 0.0442. In our sample, GAAP ETR is negatively correlated with *Tax Complexity* ( $\rho=-0.15$ ), demonstrating that firms with lower ETRs are also more complex. Similarly, the industry-adjusted measure of tax avoidance from Balakrishnan et al. (2018) is positively correlated with *Tax Complexity* ( $\rho=0.14$ ) in our sample. We therefore chose to use *CIC Score* because it is much less correlated with *Tax Complexity* and therefore is likely to yield more robust inferences. An additional advantage of *CIC Score* is that it is determined by the IRS and not directly by the firm, making it a more exogenous measure of proprietary costs.

disclosures. Finally, if *CIC Score* is a poor measure of proprietary costs, we may fail to find an association.

Finding  $\beta_1 > 0$  and  $\beta_2 < 0$  provides evidence of a trade-off between reporting complexity and proprietary costs in voluntary tax disclosure decisions. (Lynch, Romney, Stomberg, and Wangerin 2019; Burks, Randolph, and Seida 2014). To evaluate whether one effect dominates the trade-off, we use an F-test to test for a significant difference in the absolute estimated values of  $\beta_1$  and  $\beta_2$ . A p-value less than 10 percent, two tailed, rejects the null hypothesis that *Tax Complexity* and *CIC Score* have equal effects on manager's disclosure decisions. We also test whether proprietary costs moderate the relation between tax reporting complexity and voluntary disclosure. To do so, we estimate the following OLS regression:

$$\begin{aligned} \text{Disclosure Amount} = & \beta_0 + \beta_1 \text{Tax Complexity} + \beta_2 \text{High CIC Score} + \beta_3 \text{Tax Complexity} * \\ & \text{High CIC Score} + \beta_{4-8} \text{General Complexity} + \beta_{9-10} \text{Information Environment} + \\ & \text{Quarter FE} + \text{Industry FE} + \varepsilon \end{aligned} \quad (2)$$

We develop an indicator variable based on *CIC Score* to capture the highest estimated proprietary costs in our sample. The distribution of *CIC Score* suggests that the probability of being under continuous audit is low for most firm-years. This is not entirely unexpected given Ayers et al. (2018) report that only between 500 and 1,500 firms are part of the CIC program each year. For firm-years in the top quartile of the distribution in our sample, we estimate only a 29 percent likelihood of being in the CIC program. We therefore set *High CIC Score* to one for firm-years in the top decile of *CIC Score* where we estimate an 85 percent probability of CIC program participation, and zero otherwise. We expect a negative coefficient on *Tax Complexity\*High CIC Score* if voluntary disclosures increase less in tax reporting complexity for firms with the highest proprietary costs. We expect an insignificant coefficient if the association between tax reporting complexity and voluntary tax disclosure does not vary based on *High CIC Score*. In both equations,

we standardize all continuous variables in the model to be mean-zero with a standard deviation of one to facilitate interpretation of coefficients.

In all specifications, we include control variables to capture general business complexity and the firm's information environment. Balakrishnan et al. (2018) suggest a positive association between tax complexity, business complexity and financial reporting opacity that could influence demand for income tax information. We therefore include continuous measures of research and development expenses (*R&D*), firm growth (*MTB*), and leverage (*Leverage*). We also include firm size (*Size*) (Atiase 1985) and the firm's level of diversification measured using the number of segments (*NumSegs*) (Bushman, Piotroski and Smith 2004). We capture the information environment with the number of analysts following the firm during the year (*NumAnalysts*) and the scaled consensus analyst EPS forecast error for the firm prior to the quarterly conference call (*EPS Error*). We include *NumAnalysts* because prior research suggests that voluntary disclosure is positively associated with analyst following (Lang and Lundholm 1996; Tasker 1998; Frankel et al. 1999). We include *EPS Error* because prior research finds that analyst forecast errors are negatively associated with voluntary disclosure (Lang and Lundholm 1996; Hope 2003; Dhaliwal, Radhakrishnan, Tsang and Yang 2012). Appendix A provides greater detail about our calculation of all variables.

We include quarterly fixed effects to control for tax regulatory changes during the quarter, such as an extension of the R&D tax credit, and for managers' incentives to engage in fourth quarter earnings management through tax expense (Dhaliwal, Gleason and Mills 2004). Events such as these, clustered in certain quarters, could affect the volume of tax mentions. We also include industry fixed effects to control for any variation in the voluntary tax disclosures across industries. We cluster standard errors by firm and winsorize all continuous variables at one and 99

percent. In all of our multivariate analyses, we standardize each continuous variable to have a zero mean and a standard deviation of one to allow for ease in interpreting economic significance.

## IV. RESULTS

### *Descriptive statistics*

As noted above, 89 percent of firm-quarter observations in our sample report an income tax mention in either the conference call or earnings announcement. Figure 1 provides the percentage of quarterly earnings disclosures with tax mentions each year. The percentage of quarterly earnings disclosures with tax mentions each year is relatively stable over our sample period, with income tax mentions occurring in 87 to 92 percent of all quarterly observations in most years. Figure 2 provides the percentage of quarterly earnings disclosures with tax mentions by industry. A majority of firms within each industry have income tax mentions during quarterly earnings disclosures. The percentages range from a high of 95.1 percent of quarterly disclosures by firms in the business equipment industry to a low of 82.4 percent by firms in the energy industry.

[Insert Figures 1 and 2 here]

The average conference call contains roughly 3.6 tax mentions and the average earnings announcement contains approximately 2.7. The average number of words from sentences containing an income tax mention is 33 in conference calls and 18 in earnings announcements, which equates to an average of 1.32 percent of all words in conference calls and 4.47 percent of all words in earnings announcements (untabulated). Firms in our sample are large, as expected, with average market cap of \$12 billion (untabulated) and average analyst following of 11 analysts.

[Insert Table 2 here]

### *Tests of tax reporting complexity, proprietary costs, and voluntary disclosure*

Columns (1) and (3) of Table 3 present results from estimating the average effect of tax

reporting complexity and proprietary costs on voluntary income tax disclosures using equation (1). Column (1) presents results when  $\text{Log}(\text{Mention Count})$  is the dependent variable. We find a positive (negative) association between *Tax Complexity (CIC Score)* and the number of tax mentions. In terms of economic magnitude, a one standard deviation increase in *Tax Complexity* is associated with a 15.24 percent increase in the number of income tax mentions. A one standard deviation increase in proprietary costs is associated with a 7.52 percent reduction in the number of income tax mentions. The effects of *Tax Complexity* and *CIC Score* on the number of voluntary income tax mentions are not equivalent ( $p$ -value = 0.024); relative to proprietary costs, tax reporting complexity is more strongly associated with the number of tax mentions. We find similar results in column (3) when  $\text{Log}(\text{Mention Length})$  is the dependent variable. A one standard deviation increase in *Tax Complexity* is associated with a 13.68 percent increase in the number of words from sentences containing an income tax mention whereas a one standard deviation increase in proprietary costs is associated with an 8.64 percent reduction. The effects of *Tax Complexity* and *CIC Score* on the number of words from sentences containing voluntary income tax mentions are statistically equivalent, although the significance is marginal ( $p$ -value = 0.137).

Columns (2) and (4) present results from estimating equation (2) to test if there are moderating effects of high proprietary costs on the relation between tax reporting complexity and voluntary tax disclosures. In both columns, the coefficient on *Tax Complexity \* High CIC Score* is insignificant. Further an F-test reveals the joint effect of *Tax Complexity + Tax Complexity \* High CIC Score* is statistically different than zero. Thus, even for firms with the highest estimated proprietary costs in our sample (equivalent to at least an 89 percent probability of being in the CIC program), voluntary tax disclosures continue to significantly increase in tax reporting complexity.

Overall, results in Table 3 suggest that managers trade off the costs and benefits of voluntary tax disclosure. In general, the evidence suggests that the benefits of increasing tax disclosures to offset the potential negative effects of tax reporting complexity dominate managers' decisions. Even for firms with the highest proprietary costs, disclosures are increasing in tax reporting complexity.

[Insert Table 3 here]

*Tax reporting complexity, proprietary costs, and the content of income tax mentions*

In our next set of analyses, we use our detailed categorization of income tax mentions to estimate the effects of tax reporting complexity and proprietary costs on managers' likelihood of disclosing specific topics of income tax mentions. These tests allow us to exploit the richness of our data to better understand if the general effects we observe in Table 3 are uniform across all types of income tax disclosures, or if managers' propensity to discuss certain topics is differentially affected by tax reporting complexity and proprietary costs. If managers trade off these factors when deciding whether to discuss specific topics, we expect managers are more likely to discuss topics that benefit investors without being very informative to the IRS and less likely to discuss topics that are very informative to the IRS but less beneficial to investors.

Table 4 presents information on the content of income tax mentions. Panel A summarizes the content of all tax mentions provided by management across both conference calls and earnings announcements. The three most common categories of income tax mentions are: *Operations/Historical*, *Forward Looking*, and *Comparison*. Mentions in the *Operations/Historical* category often provide information about the magnitude of taxes in the current period and key drivers of tax expense. *Forward Looking* mentions include management forecasts of future quarterly or annual ETRs as well as more general statements about expected increases or decreases

in taxes and the effect of business transactions (such as stock option exercises) on future tax payments. *Comparison* mentions typically compare current period taxes to those reported in a prior period. We provide examples of each category of mention in Appendix C.

We find that 74.5 (57.8) percent of all disclosures made by management include *Forward Looking (Comparison)* income tax mentions suggesting that much of management's voluntary disclosure of income tax information may attempt to mitigate the negative effects of income tax reporting complexity on the information environment by providing information about future income tax expectations (*Forward Looking*) and highlighting changes between current and prior income tax expense (*Comparison*). Mentions of historical income tax information are also common during both the conference call and earnings announcement (75.6 percent of disclosures) as are mentions of state, local and foreign taxes (32.5 percent of disclosures) and legislation (29.0 percent of disclosures). Panels B and C separately break out management's disclosure of income tax information on the conference call and in the earnings announcement, respectively.

Analysts ask income tax-related questions during 27 percent of the conference calls in our sample. Panel D summarizes the content of analysts' income tax questions during the discussion segment of the conference call. Analysts' questions most commonly relate to forward-looking information. Analysts also often ask questions about the magnitude of taxes in the current period and key drivers of tax expense (*Operations/Historical*), as well as asking about current period taxes and how they compare to prior period taxes (*Comparison*). All three categories suggest that analysts use the interactive nature of conference calls to better understand the implications of tax expense for future earnings.

Importantly, not all income tax mentions relate to ETR or tax expense forecasts. In contrast, a meaningful percentage of all disclosures provide information other than a specific tax forecast

such as a discussion of audit settlements with tax authorities, deferred taxes (which do not affect total tax expense), expected utilization of net operating loss carryforwards and tax cash flows.

[Insert Table 4 here]

In Table 5, we estimate the likelihood of each specific type of income tax mention topic in Table 4 using logistic regressions that include all controls from equation (1). We focus on likelihood in these analyses because the average number of mentions is less than one for most topics; we therefore it is important in this analysis to understand the factors associated with the choice of mentioning a specific topic. A test of equivalence of *Tax Complexity* and *CIC Score* indicates whether one effect dominates the other. If the standardized estimated coefficient on *Tax Complexity* (*CIC Score*) is greater in magnitude than the standardized estimated coefficient on *CIC Score* (*Tax Complexity*), then tax reporting complexity (proprietary costs) dominates management's likelihood of providing income tax disclosures related to a specific topic.

We find that tax reporting complexity appears to dominate proprietary costs for *Forward Looking*, *Valuation Allowance*, *Deferred Taxes*, *Losses*, *State*, *Local*, and *Foreign*, and *Operations/Historical* income tax mentions. Management could choose to highlight *Deferred Taxes* to help analysts reconcile the effect of temporary book-tax differences on cash tax flows. Management might discuss *Valuation Allowance* and *Losses* to help analysts assess the likelihood that the firm will be profitable in the future and benefit from prior net operating losses. Similarly, management could focus on *State*, *Local*, and *Foreign* tax issues because foreign taxes issues in particular can inhibit analysts' ability to forecast future tax expense and cash flows. Further, because state, local and foreign taxes are outside the purview of the IRS, the proprietary costs of disclosure could be low relative to other issues. On the other hand, proprietary costs dominate managers' decisions to disclose information about persistent tax planning strategies and reserves

for uncertain tax positions. Given the nature of the mentions in these tax categories, management could be concerned that highlighting these tax issues increases tax authority scrutiny and that this potential cost outweighs any benefit of disclosing information about these topics to investors.

[Insert Table 5 here]

*Tests of tax reporting complexity and proprietary costs by disclosure medium*

In this section, we disaggregate quarterly mentions into those on the quarterly conference call and in the quarterly earnings announcement. This exploratory analysis allows us to better understand whether one disclosure medium is more or less influenced by proprietary costs and tax reporting complexity.

Table 6, Panel A presents results from estimating equation (1). We find a positive (negative) association between *Tax Complexity (CIC Score)* and the volume of tax mentions both on the conference call and in the earnings announcement. This pattern of results provides evidence of a trade-off between reporting complexity and proprietary costs across both disclosure mediums. Tests of equivalence between *Tax Complexity* and *CIC Score* reveal the factors are of similar importance in every specification except with respect to the number of tax mentions in earnings announcements. In this specification, the effects of tax reporting complexity are more strongly associated with the number of income tax mentions. This result is not entirely surprising given almost 45 percent of income tax mentions in earnings announcements relate to forward looking tax information, which is helpful to analysts and investors in forecasting future tax cash flows but may not be entirely informative to the IRS if it is very general in nature.

In Panel B, we present results from estimating equation (2), which includes the interaction of *Tax Complexity \* High CIC Score*. Across three of the four specifications, we estimate a significantly negative coefficient on *High CIC Score* that reflects a lower volume of tax disclosures

in both conference calls and earnings announcements for firms with the highest *CIC Score*. However, the interaction is not significant in any specification. Thus, across both disclosure mediums, proprietary costs do not moderate the relation between tax reporting complexity and voluntary tax disclosures.<sup>7</sup>

[Insert Table 6 here]

*The effect of Schedule UTP on tax-related proprietary costs*

Our final analysis uses the implementation of Schedule UTP to further validate our proxy for proprietary costs. The IRS introduced Schedule UTP in 2010 and phased in the filing requirement for firms over several years based on firm size. Schedule UTP requires firms to privately report to the IRS additional proprietary detail on the tax positions reflected in the tax reserve recorded in their financial statements. This mandatory private filing requirement should reduce the proprietary costs associated with public tax disclosure. Supporting this, Bozanic et al. (2017) find evidence that firms increase the quantity and content of mandatory tax footnote disclosures after the introduction of Schedule UTP. We re-estimate equations (1) and (2) after including *Schedule UTP* and an interaction between *Schedule UTP* and *CIC Score*.

We set *Schedule UTP* equal to one for all years in which the firm is required to file Schedule UTP with the IRS, and zero otherwise. All other variables are previously defined. To isolate the effect of Schedule UTP on tax-related proprietary costs, we limit our sample to years after the initial enactment of ASC 740-10, *Accounting for Uncertainty in Income Taxes* (FIN 48). FIN 48 requires firms to disclose the amount of tax benefits included in their financial statements that

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<sup>7</sup> Inferences from all estimations of equation (2) are unchanged if we instead set *High CIC Score* equal to one for all observations with a greater than 50 percent likelihood of CIC program participation, which is approximately 16 percent of the sample (untabulated). Inferences are also unchanged if we look at the interaction of *High Tax Complexity* and *High CIC Score*, where *High Tax Complexity* equals one for all observations in the top quartile of *Tax Complexity*. Thus, even for the subset of observations that face both high tax reporting complexity and high proprietary costs, proprietary costs do not moderate reporting complexity.

could be denied in the future if successfully challenged by tax authorities. These disclosure requirements could fundamentally change both firms' tax reporting complexity and the proprietary costs associated with management's voluntary income tax disclosures. If *CIC Score* captures tax-related proprietary costs, we expect the implementation of Schedule UTP to moderate the association between *CIC Score* and voluntary disclosure such that the coefficient on the interaction is positive. This result would suggest a weakening relation between the costs of disclosing information to the IRS and voluntary disclosure decisions following the implementation of Schedule UTP where the IRS is likely to eventually obtain a greater amount of information from the taxpayer.

Table 7 presents results. In columns (1) and (2), the coefficient on *CIC Score* \* *Schedule UTP* is positive. However, it is statistically significant only in column (1) (two-tailed p-value = 0.063). Thus, whereas prior to Schedule UTP a one standard deviation increase in *CIC Score* was associated with a 13.43 percent decrease in the number of tax mentions, the decrease is only 8.97 percent after Schedule UTP. Schedule UTP did not significantly affect the length of income tax mentions. These results are consistent with Schedule UTP reducing the proprietary costs associated with public income tax disclosure.

[Insert Table 7 here]

## **V. ROBUSTNESS CHECKS**

One benefit of using income taxes as a setting is that we can measure proprietary costs without relying on industry structure. We choose *CIC Score* because we believe it captures the salience of the IRS' adversarial position to the firm, which can in turn influence managers' disclosure decisions. However, we recognize the measure has limitations. We therefore assess the

robustness of our results in multiple ways including using other measures of proprietary costs, each of which has strengths and limitations.

### *Domestic v. Multinational Firms*

One key limitation of *CIC Score* is that it captures only the proprietary costs of disclosing information to the IRS, which is but one of many tax authorities potentially adversarial to the firm. In other words, *CIC Score* does not capture the proprietary costs of disclosure to foreign, state or local tax authorities. We therefore expect *CIC Score* is a stronger measure of proprietary costs for domestic-only firms and that any effects of *CIC Score* should be relatively stronger for domestic firms.<sup>8</sup> To test this assertion, we split the sample into domestic and multinational corporations and re-estimate equation (1) in Table 8, Panel A. In both specifications, we estimate a positive coefficient on *Tax Complexity* and a negative coefficient on *CIC Score* for both multinational and domestic firms. Thus, we confirm that managers of both types of firms trade off the costs and benefits of voluntary tax disclosures. However, proprietary costs are relatively more important incremental to tax reporting complexity for domestic firms than for foreign firms, as expected. The sum of the coefficients on *Tax Complexity* and *CIC Score* is only 3.82 for domestic firms (column 1) whereas it is 7.41 for foreign firms (column 2). Thus a one standard deviation increase in both tax reporting complexity and *CIC Score* increase disclosure more for foreign firms than for domestic firms. The difference is also more statistically significant for foreign firms (two-tailed p-value of 0.1628 vs. 0.3928 in columns (1) and (2)). The proprietary costs effect strengthens in

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<sup>8</sup> We considered a measure of the costs of disclosing information to state tax authorities but state-level audit data are generally not publicly available. To address this data availability issue, we rely on results in Gupta and Lynch (2016) that suggest state tax enforcement (e.g., audits) and restrictive state tax policies are substitutes. Therefore, proprietary costs could be lower for companies headquartered in states with restrictive tax policies because these policies themselves curb opportunities for a substantial amount of tax avoidance. For example, states with related-party addback rules require firms to disclose related-party transfers and disallow any associated tax benefits. We create a composite measure of restrictive state income tax policies based on firms' headquarters locations. In untabulated tests, we find a positive relation between state tax restrictiveness and voluntary income tax mentions, consistent with proprietary costs being lower for firms headquartered in states with more restrictive tax policies.

samples where *CIC Score* is a more complete measure of proprietary costs. However, it still does not dominate managers' disclosure decisions, even for domestic firms; tax reporting complexity is an equally important consideration for domestic firm managers. Even when we examine the interaction of *Tax Complexity* and *High CIC Score* among domestic firms, the interaction is insignificant at conventional levels (two-tailed p-value = 0.17).

#### *Alternative measures of proprietary costs*

Another limitation of *CIC Score* is that it is very sticky within one firm over time, which prohibits us from estimating changes analyses. We therefore consider alternative measures that have more time-series variation. We first consider firm-specific audit probabilities using data from the IRS Data Book. We construct a measure of federal audit probability using the percentage of corporate returns audited by size each year. One strength of this measure is that it considers audit probability more broadly and does not require firms to only be affected by the likelihood of *near continuous* IRS audit in the CIC Program. However, a key limitation of this measure in our sample is that it provides insufficient variation because 91 percent of our sample firms are in the largest size class of audit rates and therefore face the same audit probability each year. Nonetheless, in Table 8, Panel B we find the number of tax mentions is decreasing in the audit rate. Furthermore, the effect of tax reporting complexity is significantly larger than the effect of the IRS audit rate, which is consistent with our main analysis. Additionally, using a changes analysis, we find the volume of voluntary income tax disclosure decreases year-over-year as the audit rate increases.

We next consider the IRS budget. Nessa, Schwab, Towery, and Stomberg (2019) provide evidence that audit rates and proposed deficiencies decline as the IRS' enforcement budget is reduced. Assuming managers are generally aware of the IRS' resources and how resources affect the IRS' ability to effectively monitor and audit firms, we would expect a negative association

between the IRS budget and voluntary tax disclosure. Consistent with expectations, in Table 8, Panel C we find the number and length of tax mentions are both negatively associated with the level of the IRS budget. Additionally, using a changes analysis, we find the volume of income tax disclosure decreases year-over-year as the IRS budget increases. A key limitation of this measure, however, is that it varies only annually. Thus, we are essentially estimating the average annual association between proprietary costs and voluntary disclosures while controlling for firm-specific factors (Guenther 2018). Although no measure of proprietary costs is without limitations, we take comfort in the fact that we find consistent results across multiple, similar measures.

[Insert Table 8 here]

## **VI. CONCLUSION**

This study exploits income taxes as a powerful setting to test the relative importance of tax reporting complexity and proprietary costs on manager's voluntary disclosure decision. One strength of the tax setting is that we can measure proprietary costs in a way that does not rely on industry structure. This feature is beneficial because prior studies using such measures of proprietary costs often fail to find evidence consistent with the theoretical predictions. We find a positive association between tax reporting complexity and managers' voluntary income tax disclosures and a negative relation between proprietary costs and managers' voluntary income tax disclosures. This pattern of results corroborates theoretical predictions that managers face a trade-off between the costs and benefits of voluntary disclosures. In general across a battery of tests, our results suggest that reporting complexity is relatively more important than proprietary costs.

Our study contributes to two streams of literature. First, we extend the voluntary disclosure literature by jointly examining the effects of reporting complexity and proprietary costs. Thus, we directly address the concern in Beyer et al. (2010) that most studies focus on only one aspect of

disclosure at a time and are unable to provide evidence on the relative importance of each factor. Second, we advance the literature examining managers' voluntary disclosures of tax information by offering some of the first large sample descriptive evidence on the specific income tax issues managers and analysts view as important. We are also among the first voluntary tax disclosure studies to consider the effects of multiple factors that influence voluntary tax disclosures.

**APPENDIX A**  
*Variable definitions*

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**Conference Call Variables**

<i>Log(Mention Count)</i>	=	The natural log of one plus the count of income tax mentions in the quarterly earnings announcement and on the quarterly conference call.
<i>Log(CC Mention Count)</i>	=	The natural log of one plus the count of income tax mentions in management-provided information on the quarterly conference call.
<i>Log(EA Mention Count)</i>	=	The natural log of one plus the count of income tax mentions in the quarterly earnings announcement.
<i>Log(Mention Length)</i>	=	The natural log of one plus the sum of the number of words from sentences containing an income tax mention in the quarterly earnings announcement and on the quarterly conference call.
<i>Log(CC Mention Length)</i>	=	The natural log of one plus the sum of the number of words from sentences containing an income tax mention in management-provided information on the quarterly conference call.
<i>Log(EA Mention Length)</i>	=	The natural log of one plus the sum of the number of words from sentences containing an income tax mention in the quarterly earnings announcement.

**Variables of Interest**

<i>abs<math>\Delta</math>ETR</i>	=	The absolute value of the difference between firm <i>j</i> 's effective tax rate in quarter <i>q-1</i> year <i>t</i> and the previous quarter.
<i>absPermDiff</i>	=	The absolute value of the difference between firm <i>j</i> 's prior year GAAP ETR and 35 percent.
<i>CIC Score</i>	=	<i>CIC Score</i> equals the probability that a firm is part of the IRS' Coordinated Industry Case program (Ayers et al. 2017). The measure uses a point system based on information presented in the IRS Internal Revenue Manual to assess the likelihood of IRS audit based on observable firm size (total asset and gross receipts) and other characteristics including number of geographic and business segments, foreign sales percentage and foreign tax expense.
<i>ETR_STD</i>	=	The standard deviation of the quarterly effective tax rate for firm <i>j</i> over the prior year.
<i>High CIC Score</i>	=	One for firm-years in the top decile of <i>CIC Score</i> , and zero otherwise.
<i>IRS Audit Rate</i>	=	The percentage of corporate returns audited by size and year (IRS Data Book).
<i><math>\Delta</math>IRS Audit Rate</i>	=	The year-over-year change in <i>IRS Audit Rate</i> .
<i>IRS Budget</i>	=	Inflation-adjusted IRS enforcement expenditures for the year scaled by the number of tax returns audited in the same year (IRS Data Book).
<i><math>\Delta</math>IRS Budget</i>	=	The year-over-year change in <i>IRS Budget</i> .
<i>Schedule UTP</i>	=	One for years in which the firm is required to file Schedule UTP with the IRS, and zero otherwise.
<i>Tax Complexity</i>	=	The factor resulting from a principal component analysis of <i>abs<math>\Delta</math>ETR</i> , <i>ETR_STD</i> , and <i>absPermDiff</i> (Bratten et al. 2017).

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**APPENDIX A (continued)**  
*Variable definitions*

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**General Complexity Variables**

- Leverage* = Prior year long-term debt (DLTT) scaled by prior year total assets (AT).
- MTB* = Prior year market value (PRCC\_F\*CSHO) scaled by prior year book value (CEQ).
- NumSegs* = The number of 4-digit SIC segments for a firm in the current year as reported in Compustat.
- R&D* = Prior year R&D expenditures (XRD) scaled by prior year sales (SALE). If R&D expenditures exceed sales, *R&D* is set to one. If XRD is missing, XRD is set to zero.
- Size* = The natural log of prior year total assets (AT).

**Information Environment Variables**

- EPSError* = The absolute value of the consensus analyst EPS forecast error for firm *j* prior to the quarterly conference call, scaled by prior year stock price (PRCC\_F). We calculate consensus EPS forecast error as the most recent consensus analyst forecast issued prior to the quarterly conference call less actual EPS as reported in the I/B/E/S Summary History dataset.
- NumAnalysts* = The number of analysts following a firm in year *t* as reported in I/B/E/S Summary History dataset.
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## APPENDIX B

### *Tax mention search algorithm*

#### PRIMARY TAX MENTION IDENTIFICATION

A tax mention is identified by instances of the following: tax\*, IRS, ETR, UTB\*, R&D credit\*, R&E credit\*, valuation allowance\*, valuation reserve\*, NOL\*, FIN 48, Internal Revenue Service, depreciation deduction\*, domestic production activities deduction\*, DPAD

We remove any tax mention within 15 words of the following: liquidity, consumer, customer, rebate, and VAT.

We also remove all instances of the following: ad valorem tax\*, after income tax\*, after tax\*, before income tax\*, before interest tax\*, before interest expense and income tax\*, before tax\*, cigarette tax\*, consumption tax\*, Consumption tax\*, different tax\*, drink tax\*, employment tax\*, excise tax\*, export tax\*, extraction tax\*, gaming tax\*, gas tax\*, gift tax\*, individual income tax\*, individual tax\*, interest and other income tax\*, interest and tax\*, interest expense income tax\*, interest expense tax\*, interest income tax\*, interest tax\*, internet tax\*, medical device\* tax\*, net of income tax\*, net of tax\*, non income tax\*, nonincome tax\*, other than income tax\*, payroll related tax\*, payroll tax\*, personal income tax\*, personal tax\*, post income tax\*, post tax\*, pre income tax\*, pre tax\*, production tax\*, profit tax\*, property tax\*, Pump tax\*, revenue tax\*, sales tax\*, security tax\*, severance tax\*, soda tax\*, tax accountant\*, tax advisor\*, tax area\*, tax break\*, tax consultant\*, tax department\*, tax director\*, tax efficien\*, tax group\*, tax guy\*, tax implication\*, tax incentive\*, tax manager\*, tax matter\*, tax optimization, tax people, tax regime\*, tax related, tax team\*, transfer tax\*, use tax\*, value add\* tax\*, value added tax\*, valueadd\* tax\*, vice president tax\*, VP of tax\*, VP IR Taxation, VP Investor Relations and Taxation, Vice President Investor Relations and Taxation, tax effect our earnings, tax effected, tax effecting, unemployment tax\*

We also remove all instances where the only mention of “tax” relates to the title of the speaker. E.g., the title of the speaker has “TAX” in all caps in their position title as in “VP OF TAX”.

#### TAX MENTION CATEGORIES:

1. Forward Looking:
  - a. A primary tax mention within 15 words of any of the following (excluding verbs ending in ‘ed’): guidance, guide\*, guiding, model\*, updat\*, range, unchang\*, expect\*, approximat\*, around, estimat\*, forecast\*, project\*, anticipat\*, ongoing, should be, going forward, go forward, future, will, may, might, goal\*, objective\*, seek\*, intend\*, hope\*, hoping, plan\*, believe\*, outlook, going to be, is/are (now/currently/still/presently) anticipated to, is/are (now/currently/still/presently) forecasted to, is/are (now/currently/still/presently) expected to, is/are (now/currently/still/presently) projected to, is/are (now/currently/still/presently) estimated to, is/are (now/currently/still/presently) guided to, next year, next quarter, next period, rest of the year, rest of the quarter, rest of the period
  - b. Instances of: expected [tax mention] within 5 words of “is” or “are”, approximated [tax mention] within 5 words of “is” or “are”, estimated [tax mention] within 5 words of “is” or “are”, projected [tax mention] within 5 words of “is” or “are”, anticipated [tax mention] within 5 words of “is” or “are”, guided [tax mention] within 5 words of “is” or “are”, what is the tax rate, what is the effective tax rate
2. Comparison
  - a. Instances of “tax rate”, “tax expense”, or “tax provision” within 15 words of any of the following words: up, down, high\*, low\*, increas\*, decreas\*, compar\*, versus, above, below, similar
3. Transitory
  - a. A primary tax mention within 15 words of any of the following: one time, onetime, one off\*, discontinued operation\*, impair\*, true up, trueup, discrete, writeoff, write off, overstatement, understatement, remeasur\* **AND NOT** within 10 words of any of the following: settl\*, closing agreement, resolution, litigat\*
4. Persistent
  - a. A primary tax mention within 15 words of any of the following: permanent, recurring, ongoing, sustain\* **OR** within 5 words of any of the following: normal, normalized, structural
  - b. Instances of: tax planning strateg\*, tax strateg\*, tax initiative\*

**APPENDIX B (continued)**  
*Tax mention search algorithm*

5. Legislation
  - a. A primary tax mention with any of the following within the sentence: congress\*, legislation, work opportunity credit\*, work opportunity tax credit\*, welfare to work, tax credit\*, domestic production activities deduction, regulation
  - b. Instances of: tax credit\*, R&D tax, R&D credit, R&E tax, R&E credit, tax polic\*, tax law\*, tax holiday\*, tax reform, DPAD
  - c. Instances of “tax law” within 15 words of “change\*”
6. Valuation Allowance
  - a. A primary tax mention with any of the following within the sentence: valuation allowance, valuation reserve
7. Settlement
  - a. A primary tax mention with any of the following within the sentence: settl\*, closing agreement, resolution, determination, ruling, litigat\*, audit\*, exam\*
8. Deferred Taxes
  - a. A primary tax mention with any of the following within the sentence: bonus depreciat\*, accelerated depreciat\*, depreciation deduct\*
  - b. Instances of: deferred tax\*, tax asset\*, deferred income tax\*, tax depreciat\*, tax deferred asset\*, timing of tax\*
9. Reserves
  - a. A primary tax mention with any of the following within the sentence: lapse, reserve\*
  - b. Instances of: UTB\*, uncertain tax position\*, unrecognized tax benefit\*, uncertain tax benefit\*, FIN 48,
10. Losses
  - a. A primary tax mention with any of the following within the sentence: loss carry\*, net operating loss, carry forward\*
  - b. Instances of: NOL\*, tax loss\*, tax attribute\*
11. Cash Taxes
  - a. A primary tax mention within 15 words of any of the following: pay\*, paid, refund\*,
  - b. Instances of: cash tax\*
  - c. Instance of tax liability\* **AND NOT** within 5 words of “deferred”
12. State, Local and Foreign
  - a. A primary tax mention with any of the following within the sentence: repatriat\*, indefinit\*, APB 23, permanent\*, AJCA, American Jobs Creation Act, foreign earning\*, apportionment, PRT, the name of any state in the United States, the name of any country in the world
  - b. Instances of: state tax\*, state income tax\*, local tax\*, local income tax\*, foreign tax\*, foreign income tax\*, international tax\*, international income tax\*, petroleum revenue tax\*
13. Operations/Historical
  - a. A primary tax mention with any of the following within the sentence: results include
  - b. Instances of: tax expense was, tax expense for/during/in the year was, tax expense for/during/in the quarter was, tax expense for/during/in the period was, tax rate was, tax rate for/during/in the year was, tax rate for/during/in the quarter was, tax rate for/during/in the period was, tax provision was, tax provision for/during/in the year was, tax provision for/during/in the quarter was, tax provision for/during/in the period was, tax benefit was, tax benefit for/during/in the year was, tax benefit for/during/in the quarter was, tax benefit for/during/in the period was, or any of the above instances including a one-word gap between “the” and “year/quarter/period”
  - c. A primary tax mention from a sentence with a verb in the past tense that was not classified in any other category based on the above algorithm
14. Other
  - a. Primary tax mentions from conference calls in which none of the other primary tax mentions on the conference call were classified based on the above algorithm

## **Appendix C**

### *Examples of Categorized Mentions*

This appendix contains examples of mentions categorized using the tax mention search algorithm from Appendix B. If a mention contains information relating to more than one tax category, we include the comment in each category to which it applies. We provide the company name and date of the conference call for each mention provided below.

#### **1. Forward Looking**

Shifting to taxes and net income, we now expect that our effective US GAAP tax rate for 2013 will be between 22% and 26%. – Repligen Corporation, 8/1/2013

Our effective tax rate will be lower in the March quarter, favorably impacting net income. – Linear Technologies Corporation, 1/16/2013

Can you talk about what the impact for the current year's going to be for stock option expenses related to 123R and then secondly now after a few good quarters in a row of profits, what we can think about in terms of having to pay the tax man going forward and what's your current balance on the NOLs? Thanks. – Sigma Designs, 3/21/2006

#### **2. Comparison**

You may recall that our tax provision last year was significantly higher, over 90 percent, actually, for all of FY '04 because our U.S. income was insufficient to offset foreign income taxes payable. – Phoenix Technologies, 1/27/2005

In fact, the tax rate looks a little higher than it was in the first half of 2003. – TOTAL, 5/7/2004

#### **3. Transitory**

EPS in the fourth quarter included a \$0.01 discrete tax benefit. – Texas Instruments, 1/22/2008

In addition, fourth quarter results were benefited from a one-time non-recurring reversal of certain excess reserves for income taxes and bonuses and a decrease in the allowance for doubtful accounts, together which totaled about a million dollars. – Netegrity, Inc., 1/29/2003

In addition, we had the one-time favorable tax ruling I mentioned earlier in Malaysia which -- where we reversed a tax provision made last year of \$1.9 million and that was done in the quarter. – Stolt-Nielsen S.A., 7/5/2007

#### **4. Persistent**

The lower tax rate in this quarter reflects several items, including permanent differences primarily related to the Internal Revenue Code Section 199 deduction. – Pike Electric Corporation, 2/6/2013

You're saying that a 24.3% tax rate is sustainable? – WABCO Holdings, Inc., 2/7/2008

## **5. Legislation**

In October new tax legislation that extends the carryforward period for these types of credits from 5 years to 10 years was enacted. – AAR Corp., 12/17/2004

Our tax rate for 2009 is expected not to exceed 11% as we benefit from our long term Malaysian tax holiday. – First Solar Inc., 10/29/2008

Speaking of cash flows, with the recently enacted tax law changes around bonus depreciation, our current taxes in 2010 were actually a benefit of \$900,000. – Intrepid Potash Inc., 2/24/2011

## **6. Valuation Allowance**

We recorded a \$27.1 million non-cash charge for additional valuation allowance against our deferred tax assets compared to a tax benefit of \$53.5 million last year. – Rite Aid Corporation, 12/18/2008

Based on our stated accounting policy, which I have commented on in previous conference calls, and after assessment of other relevant factors, we released our remaining tax valuation allowance. – Superior Industries, 3/5/2012

## **7. Settlement**

The lower tax rate was primarily due to favorable IRS settlements and statute expirations. – LifePoint Hospitals Inc., 2/19/2010

The change in the effective tax rate and the decrease in income tax expense were driven by the release of uncertain tax positions for Garmin Europe following the conclusion of taxing authority reviews of the 2008, 2009 tax years and a change in methodology for uncertain tax position reserves following favorable audits in both 2010 and 2011. – Garmin Ltd., 5/4/2011

## **8. Deferred Taxes**

Most companies have accelerated tax depreciation and tax is higher than book. So normally that would create something called deferred tax assets that would not show up in your tax rate. – Veritas DGC Inc., 3/30/2005

What Jim was trying to explain earlier is that the deferred tax issue really is on the timing of the recognition of revenue or taxable income for tax purposes. – Hawaiian Electric Industries, Inc., 2/18/2014

## **9. Reserves**

MCI's tax provision for the first quarter included 104 million adjustments to our reserve for contingent liabilities. – MCI Inc., 5/5/2005

The tax rate for the quarter was 35.1%, and we expect our full-year 2007 tax rate to be about 32.5%, reflecting the adoption of FIN 48 and the elimination of the FISC ETI benefit. – AMETEK Inc., 4/19/2007

Tax expense was significantly higher versus the prior year, primarily due to a release of foreign tax credit reserves in the fourth quarter of 2011 that did not repeat this past quarter. – Armstrong World Industries, 2/19/2013

## **10. Losses**

So mechanically, utilization of this NOL in 2014, when profitable, does not result in a provision for taxes on our P&L. – American Airlines Inc., 1/28/2014

At this point, how long do you project that the NOLs will last? Did you acquire any NOLs through the transaction? – Westmoreland Coal Co., 4/25/2014

In addition, due to our substantial tax loss carry-forwards, we do not expect to pay federal taxes in fiscal 2012 or in the years to come. – Winn Dixie Stores Inc, 8/30/2011

## **11. Cash Taxes**

Bonus depreciation deductions in 2011 and 2012 are expected to generate \$450 million to \$500 million of cash tax benefits for APS. – Pinnacle West Capital Corporation, 2/18/2011

We did actually get a big refund first of January -- \$100 million refund on taxes that we paid in 2014. – Aaron's Inc., 2/6/2015

## **12. State, Local, and Foreign**

The tax rate in Chile is 17% and in Argentina is 35%. – Barrick Gold, 7/27/2004

We believe we will find opportunities to invest in other countries for decades to come, thereby retaining our low effective tax rate indefinitely. – The Cooper Companies, Inc., 3/7/2013

Turning to income taxes during the fourth quarter of '02, the company recognized a \$2.3m income tax benefit primarily due to net effects of income tax reform enacted in Belgium in December. – NL Industries, 1/31/2003

There are reasons to be optimistic about California as the broader economy improves and the state's new tax credit takes effect, although we will have to wait and see how budget issues at the state level affect the rate of improvement. – PulteGroup, Inc., 5/5/2010

## **13. Operations/Historical**

Our third quarter income tax rate was 35.1%, in-line with our expectation going into the quarter. – Foot Locker, Inc., 11/21/2008

The GAAP tax rate for the quarter was 25%, which was higher than our 23% target, primarily due to the sales mix in higher taxing jurisdictions than we had forecasted. – Cree Inc., 8/11/2009

## **14. Other**

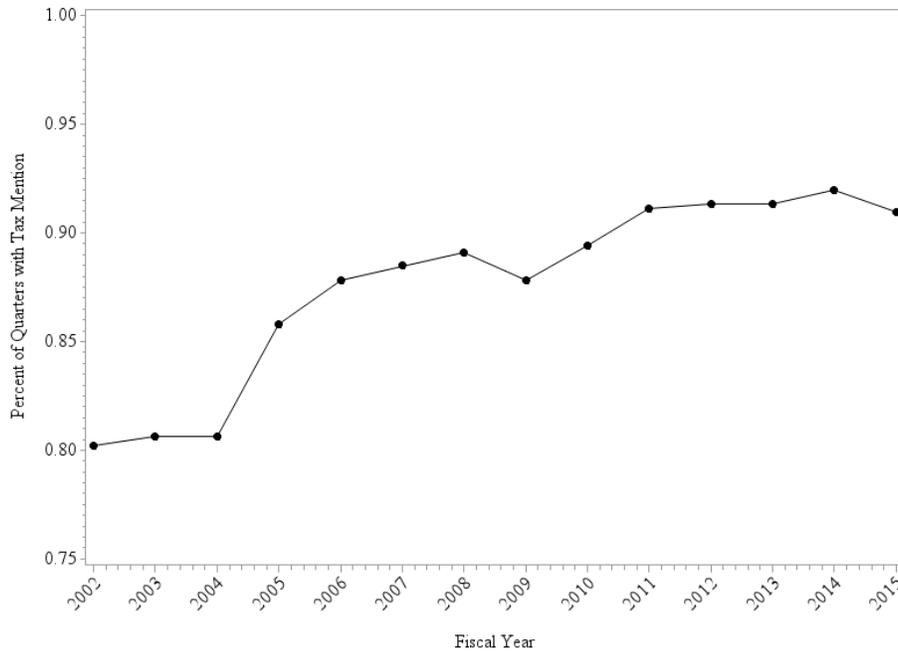
A big cost increase, which is actually a good one, is on our income taxes. – California Water Service Group, 10/28/2004

We're trying to eliminate our taxes as much as possible and generate and keep as much of our cash as we can so we can reinvest or pay down debt with that cash. – Rick's Cabaret International, Inc., 5/10/2012

**FIGURE 1**

*Percentage of Firm-Quarter Observations with an Income Tax Mention – By Year*

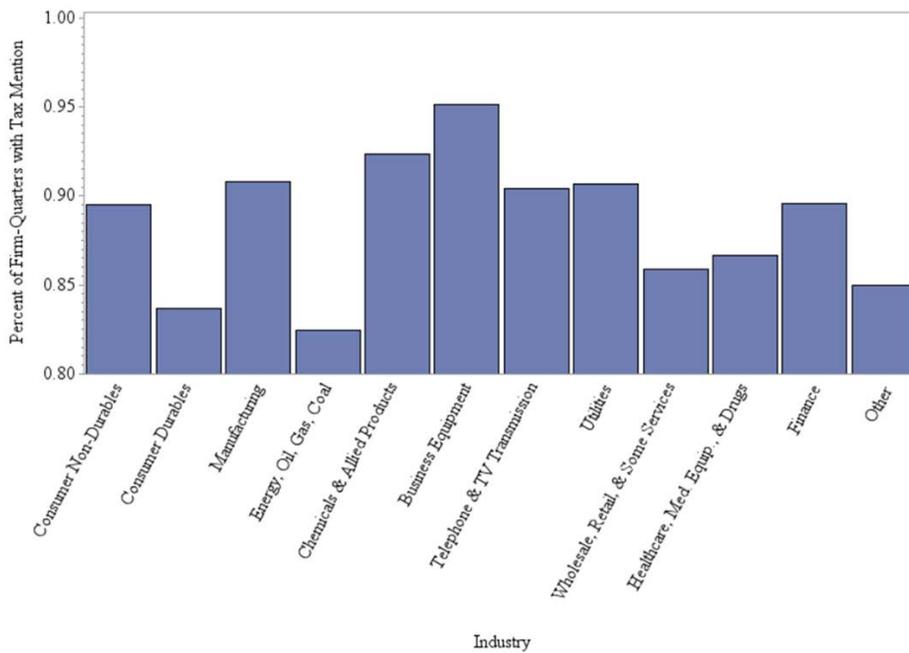
This figure presents the percentage of firm-quarter observations with income tax mentions by year.



**FIGURE 2**

*Percentage of Firm-Quarter Observations with an Income Tax Mention – By Industry*

This figure presents the percentage of firm-quarter observations with income tax mentions by industry.



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**TABLE 1**  
*Sample derivation*

This table describes our sample selection process. Panel A summarizes our sample derivation. Data restrictions do not always result in the loss of all four quarters of observations for a particular firm in a given year. We only report a reduction in the number of firms in the sample if we lose all quarters relating to that firm as a result of a data restriction. Panel B presents sample composition by industry.

*Panel A, Sample selection criteria*

	<b>Total</b>		
	<i>Number of Firms</i>	<i>Number of Firm-Years</i>	<i>Number of Firm- Quarters</i>
Initial sample	2,499	14,267	43,813
Observations missing data to compute tax complexity inputs	(102)	(638)	(5,375)
Observations with negative pretax income or tax expense	(69)	(372)	(715)
Observations missing data to compute proprietary costs	(182)	(1,303)	(3,467)
Observations missing data to compute explanatory variables	(337)	(1,519)	(4,198)
Tax preparation firms and ADP	(4)	(22)	(58)
Final sample	1,805	10,413	30,000

*Panel B, Industry classification (Fama and French 12 Industry Classification)*

	<b>Number</b>	<b>Percent</b>
Consumer Non-Durables	121	6.7%
Consumer Durables	60	3.3%
Manufacturing	260	14.4%
Energy, Oil, Gas, and Coal Extraction and Products	96	5.3%
Chemicals and Allied Products	70	3.9%
Business Equipment	388	21.5%
Telephone and Television Transmission	66	3.7%
Utilities	11	0.6%
Wholesale, Retail, and Some Services	261	14.5%
Healthcare, Medical Equipment, and Drugs	168	9.3%
Finance	11	0.6%
Other	293	16.2%
Total	1,805	100.00%

**TABLE 2**  
*Descriptive statistics*

This table presents descriptive statistics for the final sample of 30,000 quarterly conference calls. See Appendix A for variable definitions.

	<b>Mean</b>	<b>Std. Dev.</b>	<b>25th Pctl</b>	<b>Median</b>	<b>75th Pctl</b>
<u>Tax Mentions</u>					
<i>Log(Mention Count)</i>	1.7452	0.9358	1.0986	1.7918	2.398
<i>Log(CC Mention Count)</i>	1.2952	0.8318	0.6931	1.3863	1.9459
<i>Log(EA Mention Count)</i>	0.9797	0.9553	0.0000	0.6931	1.6094
<i>Log(Mention Length)</i>	4.3683	1.8359	3.8067	4.8122	5.5947
<i>Log(CC Mention Length)</i>	3.5016	1.8425	3.0445	4.0775	4.7707
<i>Log(EA Mention Length)</i>	2.8683	2.4283	0.0000	3.6376	5.0106
<u>Tax Reporting Complexity Variables</u>					
<i>absPermDiff</i>	0.0666	0.0748	0.0200	0.0398	0.0824
<i>absΔETR</i>	0.0551	0.0941	0.0075	0.0218	0.0588
<i>ETR_STD</i>	0.0606	0.1240	0.0118	0.0267	0.0600
<i>Tax Complexity</i>	0.0000	0.6178	-0.3883	-0.2158	0.1540
<u>Proprietary Cost Variables</u>					
<i>CIC Score</i>	0.2278	0.3021	0.0271	0.0759	0.2884
<u>General Complexity Variables</u>					
<i>MTB</i>	3.5965	3.8176	1.8546	2.7455	4.1493
<i>Size</i>	7.4649	1.6309	6.3032	7.3446	8.4849
<i>Leverage</i>	0.1770	0.1665	0.0160	0.1519	0.2731
<i>R&amp;D</i>	0.0292	0.0532	0.0000	0.0000	0.0307
<i>NumSegs</i>	1.8102	1.0901	1.0000	1.0000	2.0000
<u>Information Environment Variables</u>					
<i>EPSError</i>	0.0018	0.0028	0.0003	0.0009	0.0021
<i>NumAnalysts</i>	11.077	7.3302	5.0000	9.0000	16.000

**TABLE 3***Tax mentions as a function of tax reporting complexity and proprietary costs*

This table presents results for the effect of tax reporting complexity and proprietary costs on mentions of income taxes in voluntary disclosures. See Appendix A for variable definitions. All specifications include quarter and industry fixed effects. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests). Standard errors are clustered by firm and are presented in parentheses under coefficient estimates. All variables are standardized with a mean of zero and a standard deviation of one to facilitate comparison of coefficients.

<i>DV:</i>	<i>Log(Mention Count)</i>		<i>Log(Mention Length)</i>	
	(1)	(2)	(3)	(4)
<i>Tax Complexity</i>	0.1524 *** (0.011)	0.1534 *** (0.011)	0.1368 *** (0.011)	0.1379 *** (0.011)
<i>CIC Score</i>	-0.0752 ** (0.032)		-0.0864 *** (0.031)	
<i>High CIC Score</i>		-0.0908 (0.070)		-0.1607 ** (0.065)
<i>Tax Complexity*High CIC Score</i>		-0.0271 (0.038)		-0.0317 (0.034)
<b><u>General Complexity Variables</u></b>				
<i>MTB</i>	0.0402 *** (0.012)	0.0376 *** (0.012)	0.0434 *** (0.012)	0.0412 *** (0.012)
<i>Size</i>	0.3883 *** (0.036)	0.3395 *** (0.027)	0.3831 *** (0.037)	0.3388 *** (0.027)
<i>Leverage</i>	-0.0256 (0.019)	-0.0192 (0.019)	-0.0194 (0.019)	-0.0149 (0.019)
<i>R&amp;D</i>	0.0653 *** (0.023)	0.0656 *** (0.023)	0.0428 ** (0.020)	0.0436 ** (0.020)
<i>NumSegs</i>	-0.0526 *** (0.017)	-0.0519 *** (0.017)	-0.0437 ** (0.017)	-0.0415 ** (0.017)
<b><u>Information Environment Variables</u></b>				
<i>EPS Error</i>	-0.0153 (0.010)	-0.0177 * (0.010)	-0.0113 (0.011)	-0.0133 (0.011)
<i>NumAnalysts</i>	-0.0498 ** (0.022)	-0.0512 ** (0.022)	-0.0262 (0.021)	-0.0296 (0.021)
<b>Test of Equivalence (p-values)</b>				
<i>Tax Complexity = CIC Score</i>	0.024 **		0.137	
<i>Tax Complexity + Tax Complexity * High CIC Score = 0</i>		0.001 ***		0.001 ***
R <sup>2</sup>	16.79%	16.69%	14.35%	14.30%
N	30,000	30,000	30,000	30,000

**TABLE 4***Tax topics presented during conference calls and earnings announcements*

This table details the content of income tax mentions in both the quarterly conference calls and earnings announcements. The first row shows the number and percent of observations with income tax mentions. Remaining rows show the number and percent of observations covering each topic within the sample of observations with mentions. Panel A relates to management tax mentions. Panels B and C break out management mentions in the conference call and earnings announcement, respectively. Panel D describes the content of analysts' income tax questions during the conference call. *Forward Looking* refers to estimates of the annual ETR. *Comparison* refers to a comparison of the ETR to the ETR reported in a prior period. *Operations/Historical* refers to taxes in the context of year-to-date or quarterly operating results. *State, Local, and Foreign* refers to state and local income taxes or foreign income taxes. *Cash Taxes* refers to income taxes paid. *Legislation* refers to legislation relating to income taxes. *Transitory* refers to a non-recurring tax event. *Settlement* refers to a settlement with tax authorities. *Deferred Taxes* refers to an adjustment to the deferred tax balance. *Persistent* refers to a tax event that is expected to be recurring in the future. *Losses* refers to net operating losses. *Reserves* refer to tax reserves and some mentions predate the adoption of FIN 48. *Valuation Allowance* refers to the valuation allowance associated with deferred tax assets.

	<i>Panel A</i>		<i>Panel B</i>		<i>Panel C</i>		<i>Panel D</i>	
	<i>Management Mentions</i>		<i>Management Mentions - Conference Call</i>		<i>Management Mentions - Earnings Announcement</i>		<i>Analyst Questions - Conference Call</i>	
	<b>Total</b>	<b>% of Disclosures</b>	<b>Total</b>	<b>% of Disclosures</b>	<b>Total</b>	<b>% of Disclosures</b>	<b>Total</b>	<b>% of Disclosures</b>
All Tax Mentions	26,640	88.9%	24,378	81.3%	18,513	61.7%	8,103	27.0%
Operations/Historical	20,160	75.6%	16,627	68.2%	10,134	54.7%	2,426	29.9%
Forward Looking	19,851	74.5%	17,813	73.1%	8,316	44.9%	4,111	50.7%
Comparison	15,423	57.8%	13,083	53.7%	6,697	36.2%	2,103	26.0%
State, Local, and Foreign	8,666	32.5%	5,893	24.2%	4,936	26.7%	650	8.0%
Legislation	7,740	29.0%	5,214	21.4%	4,343	23.5%	725	8.9%
Cash Taxes	6,474	24.3%	4,980	20.4%	2,943	15.9%	820	10.1%
Settlement	6,404	24.0%	2,882	11.8%	4,953	26.8%	124	1.5%
Transitory	5,310	19.9%	3,243	13.3%	3,171	17.1%	243	3.0%
Other	5,185	19.4%	2,178	8.9%	3,353	18.1%	2,059	25.4%
Deferred Taxes	3,513	13.2%	1,836	7.5%	2,226	12.0%	234	2.9%
Persistent	3,266	12.2%	2,069	8.5%	1,561	8.4%	321	4.0%
Reserves	2,703	10.1%	1,484	6.1%	1,732	9.4%	51	0.6%
Losses	1,695	6.4%	1,250	5.1%	696	3.8%	198	2.4%
Valuation Allowance	1,223	4.6%	633	2.6%	878	4.7%	30	0.4%

**TABLE 5***Tax mentions as a function of tax reporting complexity and proprietary cost: By topic*

This table presents results for the effect of tax reporting complexity and proprietary costs on income tax mentions by topic for our sample of 30,000 firm-quarter observations. Coefficients are estimated using logistic regression and include controls for *MTB*, *Size*, *Leverage*, *R&D*, *NumSegs*, *EPS Error* and *NumAnalysts*. See Appendix A for variable definitions. All specifications include quarter and industry fixed effects. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests). Standard errors are clustered by firm and are presented in parentheses under coefficient estimates. All variables are standardized with a mean of zero and a standard deviation of one to facilitate comparison of coefficients.

<i>DV:</i>	<i>Variable</i>		<i>Test of Equivalence (p-value)</i>
	<i>Tax Complexity</i>	<i>CIC Score</i>	
<i>Forward Looking</i>	<b>0.2214</b> *** (0.015)	-0.1625 *** (0.026)	0.0460 **
<i>Comparison</i>	0.1275 *** (0.013)	-0.1432 *** (0.024)	0.5545
<i>Transitory</i>	0.1988 *** (0.015)	-0.2236 *** (0.031)	0.4649
<i>Persistent</i>	0.2025 *** (0.017)	<b>-0.2754</b> *** (0.038)	0.0777 *
<i>Legislation</i>	0.0638 *** (0.014)	-0.0506 * (0.027)	0.6612
<i>Valuation Allowance</i>	<b>0.3391</b> *** (0.022)	-0.0550 (0.059)	0.0000 ***
<i>Deferred Taxes</i>	<b>0.1746</b> *** (0.016)	0.0399 (0.036)	0.0000 ***
<i>Reserves</i>	0.1709 *** (0.019)	<b>-0.3036</b> *** (0.041)	0.0029 ***
<i>Settlement</i>	0.1996 *** (0.014)	-0.2194 *** (0.029)	0.5370
<i>Losses</i>	<b>0.3197</b> *** (0.019)	0.0005 (0.053)	0.0000 ***
<i>Cash Taxes</i>	0.1402 *** (0.014)	-0.1258 *** (0.029)	0.6489
<i>State, Local, and Foreign</i>	<b>0.1911</b> *** (0.013)	0.0042 (0.026)	0.0000 ***
<i>Operations/Historical</i>	<b>0.1762</b> *** (0.015)	-0.0380 (0.026)	0.0000 ***
<i>Other</i>	0.0665 *** (0.015)	-0.1007 *** (0.031)	0.3141

**TABLE 6**

*Tax mentions as a function of tax reporting complexity and proprietary costs: Conference calls and earnings announcements*

This table presents results for the effect of tax reporting complexity and proprietary costs on mentions of income taxes in voluntary disclosures broken out between mentions on the quarterly conference call and mentions in the quarterly earnings announcement. Panel A presents results of estimating equation (1) to compare the relative effect of proprietary costs and tax reporting complexity. Panel B adds an interaction to test for moderating effects of proprietary costs on tax reporting complexity. See Appendix A for variable definitions. All specifications include quarter and industry fixed effects. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests). Standard errors are clustered by firm and are presented in parentheses under coefficient estimates. All variables are standardized with a mean of zero and a standard deviation of one to facilitate comparison of coefficients.

*Panel A: Relative importance of Tax Complexity and CIC Score*

<i>DV:</i>	<i>Log(CC Mention Count)</i>	<i>Log (EA Mention Count)</i>	<i>Log(CC Mention Length)</i>	<i>Log (EA Mention Length)</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
<i>Tax Complexity</i>	0.0923 *** (0.011)	0.1586 *** (0.012)	0.0800 *** (0.011)	0.1503 *** (0.011)
<i>CIC Score</i>	-0.0830 *** (0.032)	-0.0700 * (0.037)	-0.0878 *** (0.030)	-0.0969 *** (0.037)
<b>Test of Equivalence (p-values):</b>				
<i>Tax Complexity = CIC Score</i>	0.784	0.023 **	0.809	0.173
Control Variables	YES	YES	YES	YES
R <sup>2</sup>	7.44%	16.52%	6.69%	14.68%
N	30,000	30,000	30,000	30,000

**TABLE 6 (continued)**

*Tax mentions as a function of tax reporting complexity and proprietary costs: Conference calls and earnings announcements*

*Panel B: Moderating Effect of CIC Score*

<i>DV:</i>	<i>Log(CC Mention Count)</i>	<i>Log (EA Mention Count)</i>	<i>Log(CC Mention Length)</i>	<i>Log (EA Mention Length)</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
<i>Tax Complexity</i>	0.0948 *** (0.012)	0.1565 *** (0.012)	0.0815 *** (0.011)	0.1485 *** (0.012)
<i>High CIC Score</i>	-0.1289 * (0.069)	-0.0629 (0.087)	-0.1469 ** (0.065)	-0.1477 * (0.083)
<i>Tax Complexity*High CIC Score</i>	-0.0464 (0.041)	0.0131 (0.051)	-0.0353 (0.039)	0.0025 (0.045)
<b>Test of Equivalence (p-values):</b>				
<i>Tax Complexity + Tax Complexity * High CIC Score = 0</i>	0.224	0.001 ***	0.215	0.001 ***
Control Variables	YES	YES	YES	YES
R <sup>2</sup>	7.37%	16.42%	6.62%	14.56%
N	30,000	30,000	30,000	30,000

**TABLE 7**

*Tax mentions as a function of tax reporting complexity and proprietary costs: Schedule UTP implementation*

This table presents results for the interactive effect of Schedule UTP and proprietary costs on mentions of income taxes in voluntary disclosures. See Appendix A for variable definitions. All specifications include quarter and industry fixed effects. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests). Standard errors are clustered by firm and are presented in parentheses under coefficient estimates. All variables are standardized with a mean of zero and a standard deviation of one to facilitate comparison of coefficients.

<i>DV:</i>	<i>(1) Log (Mention Count)</i>	<i>(2) Log(Mention Length)</i>
	<i>(1)</i>	<i>(2)</i>
<i>CIC Score</i>	-0.1343 *** (0.043)	-0.1262 *** (0.043)
<i>Schedule UTP</i>	0.0530 ** (0.027)	0.0582 ** (0.028)
<i>CIC Score*Schedule UTP</i>	0.0446 * (0.024)	0.0233 (0.022)
<i>High CIC Score</i>		
<i>Schedule UTP</i>		
<i>High CIC Score * Schedule UTP</i>		
<i>Tax Complexity</i>	0.1310 *** (0.012)	0.1206 *** (0.012)
Control Variables	YES	YES
R <sup>2</sup>	16.54%	13.71%
N	20,000	20,000

**TABLE 8**  
*Robustness tests*

This table presents results for the effect of tax reporting complexity and proprietary costs on mentions of income taxes in voluntary disclosures. Panel A presents results of estimating equation (1) separately on domestic firms and multinational firms using *CIC Score* as our measure of proprietary costs. Panel B presents results of estimating equation (1) using the annual IRS budget per tax return audited (*IRS Budget*) and the year-over-year change in the annual IRS budget per tax return audited ( $\Delta$ *IRS Budget*) in place of *CIC Score*. Panel C presents results of estimating equation (1) using the annual IRS audit rate of corporate tax returns (*IRS Audit Rate*) and the year-over-year change in the IRS audit rate ( $\Delta$ *IRS Audit Rate*) in place of *CIC Score*. See Appendix A for variable definitions. All specifications include quarter and industry fixed effects. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests). Standard errors are clustered by firm and in parenthesis under coefficient estimates. All variables are standardized with mean zero and standard deviation of one.

<i>Panel A, Domestic v. Multinational Firms</i>				
<i>DV:</i>	<i>Log(Mention Count)</i>		<i>Log(Mention Length)</i>	
	<i>Domestic</i>	<i>Multinational</i>	<i>Domestic</i>	<i>Multinational</i>
	(1)	(2)	(3)	(4)
<i>Tax Complexity</i>	0.1553 *** (0.016)	0.1339 *** (0.014)	0.1402 *** (0.016)	0.1173 *** (0.013)
<i>CIC Score</i>	-0.1172 *** (0.040)	-0.0598 (0.050)	-0.1458 *** (0.040)	-0.0389 (0.048)
<b>Test of Equivalence (p-values):</b>				
<i>Tax Complexity = CIC Score</i>	0.3928	0.1628	0.9026	0.1223
Control Variables	YES	YES	YES	YES
R <sup>2</sup>	16.93%	16.19%	14.78%	14.16%
N	19,342	10,658	19,342	10,658

**Table 8 (continued)**  
*Robustness tests*

*Panel B, IRS Audit Rate as a measure of proprietary costs*

<i>DV:</i>	<i>Log(Mention Count)</i>	<i>Log(Mention Length)</i>	<i>ΔLog(Mention Count)</i>	<i>ΔLog(Mention Length)</i>
	(1)	(2)	(3)	(4)
<i>Tax Complexity</i>	0.1502 *** (0.011)	0.1340 *** (0.011)		
<i>IRS Audit Rate</i>	-0.0616 *** (0.019)	-0.0857 *** (0.017)		
<i>ΔTax Complexity</i>			0.0181 *** (0.004)	0.0153 *** (0.004)
<i>ΔIRS Audit Rate</i>			-0.0278 *** (0.011)	-0.0224 ** (0.011)
<b>Test of Equivalence (p-values):</b>				
<i>Tax Complexity = IRS Audit Rate</i>	<.0001 ***	<.0001 ***	0.4038	0.5296
Control Variables	YES	YES	YES	YES
R <sup>2</sup>	16.80%	14.45%	0.37%	0.34%
N	30,000	30,000	20,756	20,756

*Panel C, IRS Enforcement Budget as a measure of proprietary costs*

<i>DV:</i>	<i>Log(Mention Count)</i>	<i>Log(Mention Length)</i>	<i>ΔLog(Mention Count)</i>	<i>ΔLog(Mention Length)</i>
	(1)	(2)	(3)	(4)
<i>Tax Complexity</i>	0.1477 *** (0.011)	0.1322 *** (0.011)		
<i>IRS Budget</i>	-0.0794 *** (0.008)	-0.0744 *** (0.008)		
<i>ΔTax Complexity</i>			0.0179 *** (0.004)	0.0150 *** (0.004)
<i>ΔIRS Budget</i>			-0.1203 *** (0.015)	-0.1123 *** (0.016)
<b>Test of Equivalence (p-values):</b>				
<i>Tax Complexity = IRS Budget</i>	<.0001 ***	<.0001 ***	<.0001 ***	<.0001 ***
Control Variables	YES	YES	YES	YES
R <sup>2</sup>	17.27%	14.71%	1.05%	0.94%
N	30,000	30,000	20,756	20,756