

Auditor-Provided Tax Services and Tax Disclosure

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February 2024

ABSTRACT: Prior literature suggests tax teams and audit teams share client-specific knowledge to improve audit quality. Consistent with the benefits of this knowledge sharing, we predict and find that companies purchasing tax services from their external auditor provide more readable tax footnotes. We find that the effect of auditor-provided tax services (APTS) on tax disclosure is stronger when the APTS provider is a tax expert or a Big4 audit firm. In additional analyses, results suggest that the audit-office level distraction of providing higher levels of APTS and the within-industry variation in tax footnote readability influence the positive relation between APTS and tax disclosure quality. We further document that companies with APTS disclose more information about their tax planning and accounts related to future benefits and uncertainty. Finally, we find that managers of companies with APTS also provide more tax information during earnings conference calls. Overall, this study provides evidence of a positive association between auditor-provided tax services and tax disclosure quality.

Keywords: Auditor-provided tax services; knowledge sharing; tax disclosure

Data Availability: All data used in this study are from publicly available sources.

We appreciate helpful comments and suggestions from Stephen Stewart (discussant), conference participants at the 2022 AAA Annual Meeting, and workshop participants at the University of Nebraska-Lincoln and the University of Nebraska at Omaha. We also thank Raj Srivastava and Naaswer Mohammed for their assistance in harvesting tax footnote data from electronic 10-K filings.

I. INTRODUCTION

Investors, regulators, and standard setters have expressed increasing concern about the ability of financial statement users to understand footnote disclosures in firms' financial reports (Francis 2014; Monga and Chasten 2015; Olive 2020). Income tax footnote disclosures are among the most complex disclosures and consistently rank as one of the leading sources of comment letters issued by the SEC (E&Y 2011, 2020; Graham, Ready, and Shackelford 2012; Deloitte 2012; Kubick, Lynch, Mayberry, and Omer 2016; Inger, Meckfessel, Zhou, and Fan 2018; Luo, Ma, Omer, and Xie 2023). Tax disclosures have also attracted the attention of the Internal Revenue Service (Bozanic et al. 2017; Fox and Wilson 2023), and the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB) have pursued initiatives aimed at improving the tax disclosure quality for financial statement users (FASB 2016, 2018, 2019, 2023; IASB 2019; Brushwood, Johnston, Kutcher, and Stekelberg 2019). Given the prominent attention directed toward tax disclosure quality, we examine how auditor-provided tax services (APTS) – a common practice among U.S. publicly traded companies – are associated with improved tax footnote disclosure quality.

Tax compliance and planning activities are permissible non-audit services allowed under The Sarbanes-Oxley Act (SOX 2002).¹ APTS provides an interesting institutional setting because the tax partner is a member of the audit team, providing a channel through which information may be shared and disseminated between audit and tax personnel. Extant research has recognized the benefits realizable when audit and tax teams share knowledge (also referred to in the literature as “knowledge spillover”).² For example, De Simone, Ege, and Stomberg (2015) argue that the

¹ The revenue generated from non-audit services represents a significant proportion (37 to 59 percent) of total audit firm revenue (Harris 2014).

² See Simunic (1984); Beck, Frecka, and Solomon (1988); Gleason and Mills (2011); Kinney, Palmrose, and Scholz (2004); Robinson (2008); Christensen, Olson, and Omer (2015); and Chyz, Gal-Or, Naiker, and Sharma (2021).

shared information between tax and audit teams allows for an improved understanding of how transactions affect a company's internal controls, and they provide evidence that firms that use APTS are significantly less likely to report a material internal control weakness. Although several studies suggest that knowledge sharing through APTS positively affects audit quality, it is unclear whether and to what extent APTS affects financial statement disclosure.

We build on prior literature and predict an association between knowledge sharing through APTS and financial statement disclosure quality. First, reviewing footnotes falls directly under the purview of the audit engagement (AU 551; AS 1001). Extant literature recognizes that financial statement footnote disclosure quality can affect auditors' assessment of engagement risk and investors' assessments of firm value and that managers can be motivated to issue disclosures that hide the transitory nature of good news or the permanent nature of bad news through less readable disclosures (Bloomfield 2002; Li 2008; De Franco, Wong, and Zhou 2011; Kim, Wang, and Zhang 2019; Ertrugrul, Lei, Qiu, and Wan 2017; Lo, Ramos, and Rogo 2017; Abernathy, Guo, Kubick, and Masli 2019). Having the audit firm involved in tax planning not only deepens an audit firm's awareness of transaction details and audit risks and improves the auditor's understanding of how transactions and processes affect internal controls over financial reporting (De Simone et al. 2015) but also potentially constrains managerial incentives to issue obscure disclosures to hide bad news or diminish the prominence of material risks.

Audit firms providing tax planning and compliance services are also more likely to be aware of the increasing attention regulators and standard setters have devoted to improving the quality of tax disclosures. For example, investors and U.S. lawmakers are pressuring companies for higher-quality tax disclosures (Olivo 2020). Christensen, Glover, Omer, and Shelley (2016) find that investors view poorly written disclosures as a second leading publicly available signal of

an audit quality failure. In addition, receipt of a tax-related comment letter could trigger auditor switches because the audit committee could interpret the comment letter as the auditor's failure to ensure compliance with accounting disclosure requirements (Baldwin, Blankley, Hurtt, and MacGregor 2023). Thus, to reduce these potential costs, audit offices providing APTS could use the improved company-specific knowledge to ensure that their clients provide higher-quality tax disclosures.

The support from prior literature for a positive relation between APTS and tax footnote disclosure quality notwithstanding, some factors may preclude the extent to which this relation holds. First, the provision of APTS can distract the audit function, weakening the beneficial effect of knowledge sharing through APTS on financial reporting quality (Beardsley, Imdieke, and Omer 2021; Hux, Bedard, and Noga 2023). Further, the variation (we refer to this as ‘noise’ following the intuition from Kahneman, Sibony, and Sunstein 2021) in disclosure quality within an industry makes peer disclosure benchmarks less salient to the auditor and, therefore, more difficult to assess whether the audit client’s disclosures are opaque.

Using a sample of firm-years from 2004 – 2019, we find that companies purchasing APTS provide more readable and informative tax footnotes, suggesting that APTS provision improves the quality of tax footnotes. This result is consistent with our main prediction that greater client knowledge obtained from the tax and audit teams’ involvement in tax planning improves the auditor’s understanding and assessment of internal controls over financial reporting and constrains managerial incentives to issue obscure disclosures. Further, we demonstrate that this relation holds in both panel regression analyses and inverse probability weighting with regression adjustment (IPWRA) to account for the non-random nature of companies purchasing APTS.

To sharpen inferences, we re-examine our main results using a difference-in-differences design predicated on the 2005 KPMG deferred prosecution agreement and a first-differences specification in which we exploit the effect of changes in APTS on tax disclosures. We also validate our primary results with evidence that companies purchasing APTS disclose more information about their tax strategies and tax accounts related to future benefits and uncertainty; thus, not only do these companies disclose more readable tax footnotes, but the footnotes are more informative (insofar as informativeness manifests through more extensive disclosure of tax strategies and tax uncertainty).

In cross-sectional analyses, we observe a stronger relation between APTS and tax footnote disclosure quality when the audit firm is a tax industry expert or a Big-4 audit firm. The stronger relation among industry expert APTS providers is consistent with expertise providing a setting where information sharing between tax and audit teams is more effective in mitigating obscure tax disclosures. The stronger relation among Big-4 APTS providers is consistent with reputational concerns and resources accentuating the positive relation between APTS and tax disclosure quality.

Although we demonstrate a positive association between APTS and tax footnote disclosure quality in several specifications, we also provide evidence that this association weakens in two specific settings. First, we find that the positive relation between APTS and tax disclosure quality is strongest when the office-level APTS provider is less distracted by providing non-audit services. This result is consistent with the negative (distraction) effect of non-audit services documented in Beardsley et al. (2021) and suggests that the benefits of engagement team knowledge sharing are lower when APTS becomes a potential distraction at the office level. Second, we find that high industry variation in tax disclosure quality weakens the positive relation between APTS and tax

disclosure quality. This novel result is consistent with Kahneman et al. (2021) intuition that high variation outcomes make benchmarks less salient. In our setting, high variation in tax disclosure quality within a client's industry makes it difficult for the auditor to assess the extent to which the client's disclosure is obscure (relative to industry peers).

Our study offers the following contributions. First, we extend the literature examining the positive effects of knowledge sharing through APTS on audit quality (e.g., De Simone et al. 2015; Hux et al. 2023) by demonstrating that the beneficial effects of APTS are also related to tax disclosure quality. Importantly, however, we demonstrate that the beneficial effect of APTS on tax disclosure quality is more robust in the presence of tax expertise and weaker when office-level distraction is high or industry benchmark salience is low. Thus, our results suggest that the relation between APTS and tax disclosure quality is nuanced and depends on certain contextual factors.

Second, extant tax literature has primarily focused on the effect of APTS on tax avoidance (e.g., Gleason and Mills 2011; McGuire, Omer, and Wang 2012; Hogan and Noga 2015). In contrast, we examine the extent to which APTS is related to improved tax disclosure, which is important because tax footnote disclosure provides the primary context for understanding the tax accounts. Further, growing interest from regulators and policy makers regarding ways to improve tax disclosure quality underscores the merit in examining institutional settings in which tax disclosure may be positively or negatively affected. Thus, our study should interest analysts, investors, policymakers, and researchers seeking a more complete understanding of the extent to which APTS can affect tax disclosure quality.

II.LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Auditor-provided tax services and knowledge-sharing

Prior literature suggests knowledge sharing is a benefit of APTS. Kinney et al. (2004) document that clients' financial statement restatements are less frequent when audit firms provide APTS. Seetharaman, Sun, and Wang (2011) use data from the post-SOX period and document fewer tax-related restatements for companies purchasing APTS. De Simone et al. (2015) find that audit firms with APTS improve their clients' internal control quality, suggesting APTS allows audit firms to know more about activities material to the financial statements. Gleason and Mills (2011) find that companies using APTS have more accurate tax reserves and fully reserve for potential IRS disputes. Cook, Huston, and Omer (2008) provide evidence that purchasing APTS explains at least a portion of the adjustments to companies' third- and fourth-quarter ETRs to meet earnings forecasts. Their result suggests that the last chance earnings management reported in Dhaliwal, Gleason, and Mills (2004) is partly the result of tax planning.

Dhaliwal et al. (2018) found a positive association between the level of APTS and total book-tax differences (a proxy for tax avoidance). McGuire et al. (2012) document that clients of auditors who are tax experts engage in more tax avoidance. Christensen et al. (2015) find evidence that audit firms' industry expertise constrains clients' earnings management through tax accounts. They suggest that knowledge spillover between audit and tax teams reduces "last chance earnings management." Hogan and Noga (2015) also find that APTS can affect long-term tax avoidance. Cook, Kim, and Omer (2020) find that companies eliminating APTS and obtaining tax services from new providers reduce tax avoidance. They suggest "the new provider lacks familiarity with client's existing tax planning or does not have the expertise to generate new tax-avoidance opportunities.". Chyz et al. (2021) provide evidence that compared to companies without APTS,

companies with APTS enjoy lower effective tax rates and higher cash tax savings without increasing tax risk. Finally, Nesbitt, Persson, and Shaw (2020) document a non-linear association between APTS and tax avoidance, suggesting that auditors draw a line in the sand for tax advisory services. Although the current literature focuses on the knowledge-sharing effect of APTS on audit quality or tax avoidance, none of these studies examine the association between APTS and financial statement disclosures.

Financial Statement Tax Disclosure

Tax-related information is essential in the decision-making process of different capital market participants and regulators. For example, Kim, Schmidt, and Wentland. (2020) and Bratten, Gleason, Larocque, and Mills (2017) suggest that analysts incorporate tax information in their annual earnings forecasts, providing evidence of the importance of tax footnote information to market participants. Hutchens (2017) documents that tax disclosure characteristics help analysts understand the tax information in the income tax footnotes. Shane and Stock (2006) and Amir and Sougiannis (1999) find that analysts provide less precise forecasts when they do not fully understand certain tax information (e.g., deferred taxes from carryforwards or valuation allowances). From a qualitative tax disclosure perspective, Luo et al. (2023) document that tax information in tax footnotes is useful for investor assessment of firms' value.

The IRS also uses information in tax footnotes to help it decide whether to audit a company (Beck, Davis, and Jung 2000; Mills and Sansing 2000; Mills, Robinson, and Sansing 2010). Consistent with this argument, Bozanic et al. (2017) document that, in addition to obtaining tax information from Schedule UTP privately, the IRS acquires public tax information from income tax footnotes, suggesting that public and private disclosure interact to influence tax enforcement. Using the Fog index as their readability measure, Inger et al. (2018) found a positive association

between the readability of tax footnotes and the tax avoidance level in companies with tax avoidance below industry peers. This result suggests that managers tend to highlight their tax savings. Balakrishnan, Blouin, and Guay (2019) find that managers realize the need for transparency when engaged in more aggressive tax avoidance and take steps to improve the transparency of their tax disclosures. Finally, anecdotal evidence suggests that different stakeholders demand tax disclosure transparency. For example, investors and U.S. lawmakers are pressuring companies to provide high-quality tax disclosures (Olivo 2020). Given that the information in tax footnotes is valuable to different decision-makers and managers use footnotes to communicate tax-related information, it is important to examine the association between APTS and the quality of companies' tax disclosures.

Hypotheses

Auditors are responsible for reviewing tax footnote disclosure in the 10-K (AS 1001). Prior literature suggests that opaque tax disclosures could result in SEC comment letters (Deloitte 2012; Kubick et al. 2016), which could trigger companies to switch auditors (Baldwin et al. 2023). Thus, auditors have incentives to ensure that their clients provide higher quality tax footnotes because opaque tax-related disclosures could increase auditor litigation and reputation risk and the risk of dismissal.

The joint APTS provision provides a knowledge-sharing channel between the tax and audit teams to have “opportunities to work alongside the source of the knowledge” (Vera-Muñoz, Ho, and Chow 2006). With the provision of APTS, the communication between tax and audit teams is greater (Gleason and Mills 2011), which ensures that audit teams have enough tax-domain knowledge to constrain their clients to provide less opaque tax disclosures. Having the audit firm involved in tax planning deepens an audit firm’s awareness of transaction details and audit risks

and improves the auditor's understanding of how transactions and processes affect internal controls over financial reporting (De Simone et al. 2015). Hux et al. (2023) also document that, through the knowledge-sharing channel, audit teams can better identify risky and complex areas, including complex tax strategies, to avoid potential restatements. With a better understanding of tax-related risks and regulations, the provision of APTS helps audit teams potentially constrain managerial incentives to issue obscure disclosures to hide bad news or diminish the prominence of material risks. Thus, providing APTS could allow audit teams to become more familiar with clients' tax activities, helping their clients provide high-quality tax disclosures. Based on the discussion above, we state the following hypothesis.

H1: There is a positive association between APTS provision and the quality of tax disclosures.

Tax Expert Audit Firms

Bonner, Davis, and Jackson (1992) document that tax expertise helps auditors identify issues in the tax planning process. Audit firms could develop industry expertise by investing in industry-specific training of tax professionals (Mayhew and Wilkins 2003) and generating experience by providing services to clients with similar characteristics (e.g., industry membership) (Solomon, Shields, and Whittington 1999). After generating and accumulating industry-specific knowledge, audit firms likely possess superior industry-specific knowledge compared to non-tax expert audit firms, which could help their clients identify tax-planning opportunities. Consistent with this argument, Christensen et al. (2015) find that national industry experts constrain earnings management through tax accounts. McGuire et al. (2012) also demonstrate that clients purchasing tax services from tax-expert audit firms engage in more tax avoidance.

Similarly, auditors with industry tax expertise likely possess superior knowledge of industry-specific tax planning that not only increases tax-planning opportunities but could also

help clients improve the quality of their tax disclosures. We predict that companies purchasing APTS from tax-expert audit firms are more likely to have higher-quality tax disclosures. Based on the discussion above, we state the second hypothesis as follows:

H2: The association between APTS and the quality of tax disclosure is stronger when APTS providers are tax experts than when APTS providers are non-tax experts.

Big4 Audit Firms

DeAngelo (1981) provides evidence that Big4 audit firms have more experience, training resources, and higher litigation and reputation costs. Consistent with this evidence, Klassen, Lisowsky, and Mescall (2016) find that, compared to companies whose tax preparer is not the auditor, clients of Big4 tax preparers have lower tax aggressiveness. Czerney, Lisic, Wu, and Zhang (2020) document that Big4 auditors constrain management's use of optimistic language in notes to financial statements while auditing financial reports. These findings suggest that, because of higher litigation risk compared to non-Big4 audit firms, Big4 audit firms demand higher quality financial statement disclosures (including tax footnotes). Thus, the Big4 audit firms have more incentives (e.g., higher litigation risk and reputation costs) and more ability (e.g., more experience and more resources) to require clients to produce higher quality tax footnote disclosures than non-Big4 audit firms. We expect that companies with a Big4 APTS provider are more likely to provide higher-quality tax disclosure. Based on the discussion above, we state the following hypothesis:

H3: The association between APTS and the quality of tax disclosure is stronger when APTS providers are Big4 audit firms than non-Big4 audit firms.

III. METHODOLOGY

Sample

We derive our sample initially from the intersection of the Compustat North American and Audit Analytics databases. We extracted the income tax footnotes and conference calls from the

SeekiNF database and merged this data with the Compustat-Audit Analytics intersection. The sample period is from 2004 to 2019. The passage of Sarbanes-Oxley was in 2002, and Congress ratified SOX in 2004, resulting in significant changes in the auditing industry. Thus, the sample starts in 2004 to ensure a consistent regulatory environment. Our sample ends in 2019 to avoid potential confounding associated with the COVID-19 pandemic that began in early 2020.

Table 1, Panel A, provides details related to sample selection. We exclude companies in the financial services (SIC codes 6000-6999) and utility industries (SIC codes 4900-4999) from the sample because regulatory and company structures are fundamentally different. Then, consistent with prior related tax research, we eliminate companies with assets lower than \$1 million to mitigate issues related to small deflators. We also remove companies with negative tax expense, taxes paid, and pre-tax book income because of the inherently different tax planning positions. Finally, we require firms to have ETRs within the [0,1] interval to ensure the interpretations of ETRs are meaningful. The final sample consists of 21,178 company-year observations (3,884 unique companies).

Table 1, Panel B, provides the industry distribution of the full sample. For brevity, we use one-digit SIC for industry classification in this table.³ Results suggest that more than half of the firms in the sample are from the food, tobacco, textiles, paper, chemicals and manufacturing, machinery, and electronics industries. The sample has broad industry representation in both *APTS* and *NONAPTS* companies.

Insert Table 1 here

³ We use two-digit SIC for industry classification in regressions.

Tax Disclosure Quality Measures

We use three measures to represent tax disclosure quality. The first two represent the readability of a tax footnote, and the last one represents tax footnote length. Gunning-Fog index (*FOG*) and Flesch-Kincaid grade level (*FKGL*) are two readability measures commonly used in evaluating the difficulty level of documents. *FOG* measures the difficulty level of a text by estimating a function of the percentage of complex words and the number of words per sentence (Gunning 1952; Loughran and McDonald 2014).⁴ Similar to *FOG*, *FKGL* defines readability using the components of complex words and sentences. However, *FKGL* uses a word's explicit count of syllables rather than a binary classification of complex words (Kincaid, Fishburne, Rogers, and Chissom 1975; Loughran and McDonald 2014). Both measures have been used extensively as proxies of readability in disclosure research (e.g., Miller 2010; Lehavy, Li, and Merkley 2011; Dougal, Engelberg, Garcia, and Parsons 2012; Lawrence 2013; Callen, Khan, and Lu. 2013; Franco, Hope, Vyas, and Zhou. 2015; Li 2008; Abernathy, Guo, Kubick, and Masli 2019; Inger et al. 2018).

Following this line of research, we use the *FOG* and *FKGL* to proxy for the readability of the income tax footnotes. Lower values of *FOG* and *FKGL* reflect text that is easier to read. To represent the length of a tax footnote, we define *LENGTH* as the natural logarithm of the number of sentences in a tax footnote. Higher values of *LENGTH* indicate a more extensive tax footnote. We expect firms with a high quality of tax disclosure to have higher transparency (lower *FOG* and *FKGL*) and more information in their tax footnotes (higher *LENGTH*). In other words, such firms disclose more readable tax-related information to capital market participants.

⁴ Complex words are defined as words with more than two syllables.

Empirical Design

We estimate the following regression (we omit company and year subscripts for brevity):

$$\text{TaxDisclosureQuality} = \alpha + \beta_1 \text{APTS} + \gamma_k \text{Controls} + \text{Fixed Effects} + \varepsilon \quad (1)$$

Following Christensen et al. (2015), *APTS* is one if a company's financial statement auditor provided tax services exceeding \$61,000 and zero otherwise. The cutoff, \$61,000, is the median auditor-provided tax services for the intersection of Compustat and Audit Analytics from 2004 to 2019. This measure ensures that *APTS* services are meaningful enough to provide auditors with useful client information (not merely tax return preparation) (Christensen et al. 2015).⁵ A negative (positive) β_1 on *FOG* and *FKGL (LENGTH)* indicates that companies purchasing *APTS* tend to provide higher-quality tax footnotes, consistent with knowledge spillover. On the other hand, a positive (negative) β_1 on *FOG* and *FKGL (LENGTH)* could suggest that companies purchasing *APTS* tend to obfuscate tax information by providing lower-quality tax disclosure.

However, *APTS* treatment is not randomly assigned, which could constrain the ability to identify *APTS*'s average treatment effect (ATE). Thus, it is unclear to what extent covariates obscure observed results for the treatment companies. We apply inverse probability weighting with regression adjustment (IPWRA) to address this issue. IPWRA can address the potential confounding effects of the imbalance between the treatment and control groups that can bias results. IPWRA has three important features. First, IPWRA uses the inverse of the groups' propensity scores (i.e., the probability of being a treatment company) to weight treatment and control groups, thereby removing the differences (imbalance). Thus, this approach allows better estimation of the treatment effect differences between treatment and control groups (Funk, Westreich, Wiesen, Stürmer, Brookhart, and Davidian 2011; Morgan and Winship 2015;

⁵ Following Christensen et al (2015), we also use \$100,000 as a cutoff for *APTS*. The results are consistent.

Vansteelandt, Carpenter, and Kenward 2010; Narduzzi, Golini, Port., Stafoggia, and Forastiere 2014). Second, IPWRA is a doubly robust estimator. Unlike other two-stage methods that require an exclusionary variable in the first-stage regression to control for selection bias, IPWRA can include the same variables in the first (treatment) and second (outcome) equations. Thus, the estimator is consistent even if there is misspecification in the treatment or outcome models (Funk et al., 2011; Morgan and Winship 2015; Vansteelandt et al. 2010). Third, IPWRA estimates the average treatment effect (ATE), the difference in the effect magnitudes of a dependent variable in the treatment and control groups. The ATE observed in a sample is generalizable to the population of companies purchasing APTS beyond those in our sample. IPWRA also estimates the average treatment effect on the treated (ATET), representing the treatment effect for treated companies. To implement IPWRA, we use Model (2) in the first stage to estimate the probability of being a treatment company (*APTS*).

$$\begin{aligned}
 APTS = & \alpha + \beta_1 GAAPETR + \beta_2 ROA + \beta_3 ACC + \beta_4 SIZE + \beta_5 FI + \beta_6 EQINC + \beta_7 INTAN + \beta_8 PPE \\
 & + \beta_9 NOL + \beta_{10} \Delta NOL + \beta_{11} MTB + \beta_{12} LEV + \beta_{13} FCF + \beta_{14} XRD + \beta_{15} TAXCONTENT1 + \\
 & \beta_{16} TAXCONTENT2 + \beta_{17} BIG4 + \beta_{18} READABILITYFTNOTE10K + \beta_{19} READABILITY10K \quad (2)
 \end{aligned}$$

We estimate ATE and ATET on tax disclosure measures in the second stage using the weighted samples. The results of interest are ATE and ATET, the differences in tax disclosure measures between companies purchasing APTS and companies not purchasing APTS (*NONAPTS*). When *FOG* and *FKGL* are the dependent variables, a negative (positive) ATE and ATET indicate that companies purchasing APTS have more (less) readable tax footnotes than companies not purchasing APTS. When *LENGTH* is the dependent variable, a positive (negative) ATE and ATET indicate that companies purchasing APTS have more (less) extensive tax footnotes than companies not purchasing APTS.

We gathered control variables from prior literature and included them in both specifications. We group these control variables into three categories: tax avoidance level (*GAAPETR*), company characteristics, and annual report characteristics. Inger et al. (2018) document that there is a positive (negative) association between tax avoidance and tax footnote readability when companies have less (more) aggressive tax planning than their industry peers. Thus, we include *GAAPETR* to control the effect of tax avoidance on tax disclosure.

We also include company characteristics to control their potential effects on tax disclosure. Prior literature suggests an association between companies' performance levels and managerial disclosures (Li 2008) and tax avoidance level (Gupta and Newberry 1997), so we control for return on assets (*ROA*) in the analysis. Given the association between companies' financial reporting quality and tax activities (Frank, Lynch, and Rego 2009), we include pre-tax discretionary accruals (*ACC*). Following Inger et al. (2018), we also include firm size (*SIZE*), measured as the natural logarithm of the market value of equity, because large companies are more capable of avoiding tax (Siegfried 1974) which may affect tax footnote disclosure.

We include a control for foreign operations (*FI*) because multinational companies have opportunities to shift income to jurisdictions with lower tax rates (Rego 2003), which could affect how companies disclose these activities. We also expect equity method earnings (*EQINC*), intangibles (*INTAN*), depreciation tax shields (*PPE*), and R&D expenses (*XRD*) to affect tax disclosure because these are important considerations for managers to engage in tax planning activities. Because tax losses are common tax planning strategies that companies often use, we include both the existence and changes of net operating losses (*NOL* and ΔNOL) to control for the potential impact on how companies describe them in their tax footnotes. To control for the potential impact of growth opportunities on tax footnote readability, we add a lagged market-to-book ratio

(*MTB*). Tax shields produced by leverage could help companies avoid more tax (Stickney and McGee 1982), which might require clarification in tax footnotes, so we control for leverage (*LEV*). We control for free cash flow (*FCF*) because prior literature suggests an association between the level of cash holding and tax planning (Dhaliwal, Huang, Moser, and Pereira. 2018) and tax uncertainty (Hanlon, Maydew, and Saavedra. 2017), affecting description of tax activities in tax footnotes.

To control for the effect of tax footnote content, we include the number of words or phrases surrounding six tax-related topics (tax jurisdiction, international subsidiaries, foreign sales, tax uncertainty, valuation allowance, and tax benefits). To improve coefficient interpretation and determine whether these terms represent the same or different constructs, we use principal components analysis to generate two variables (*TAXCONTENT1* and *TAXCONTENT2*) from the six tax content variables.⁶ We interpret the first factor as representing uncertainty, which could arise from the number of jurisdictions, tax uncertainty (i.e., uncertain tax positions), the need for a valuation allowance, and expected tax benefits. We interpret the second factor as representing foreign operations, including international subsidiaries and foreign sales. We include a Big4 (*BIG4*) control for the potential effect of Big 4 auditors' demands for more transparent tax disclosure. To control for the association between tax footnote readability and characteristics of entire 10-K file and footnotes portion, we control for the readability (length) of the entire 10-K file (*FOG10K*, *FKGL10K*, and *LENGTH10K*) and the readability (length) of non-tax footnotes (*FOGFTNOTE*, *FKGLFTNOTE*, and *LENGTHFTNOTE*).

⁶ In the principal component analysis, eigenvalues for the six components are 1.59, 1.05, 0.97, 0.92, 0.88, and 0.59, respectively. We choose the first two components with eigenvalues greater than one. Variables with weights greater than or equal to 0.30 for the first component (*TAXCONTENT1*) are tax jurisdiction (0.62), tax benefits (0.32), tax uncertainty (0.49), and valuation allowance (0.41). Variables with weights greater than or equal to 0.30 for the second component (*TAXCONTENT2*) are international subsidiaries (0.36), foreign sales (0.68), and tax benefits (0.31).

Estimations of the model include fiscal year and industry fixed effects to control for time and industry invariant characteristics. Finally, we cluster standard errors by company (Cameron and Miller 2015; Gow, Ormazabal, and Taylor. 2010) and winsorize continuous variables at the 1 and 99 percent levels to mitigate outlier influence. We define all variables in Appendix B.

IV. RESULTS

Summary Statistics

In Table 2, we report the descriptive statistics of the measures used in regression models. The distributions of these measures are consistent with prior literature. For example, about 20 percent of auditors are tax experts (*TAXEXPERT*), which is consistent with the distribution in Christensen et al. (2015) and McGuire et al. (2012). The mean *GAAPETR* is 30.4 percent, consistent with prior tax avoidance literature (e.g., Kubick et al. 2016). All other company characteristics measures are consistent with prior tax literature (Kubick et al. 2016). Finally, measures of the readability of 10-K files are consistent with prior literature (e.g., Li 2008).

Insert Table 2 here

Univariate Results

Table 3 compares differences in tax footnote disclosure characteristics between companies with APTS (*APTS*) and those without APTS (*NONAPTS*). The mean of *FOG* is significantly lower (p-value < 0.01) in companies with APTS (26.763) than in companies without APTS (28.279). The results are consistent when we use *FKGL* as the readability measure. The mean of *LENGTH* is significantly greater (p-value < 0.01) in companies with APTS (3.012) than in companies without APTS (2.683), suggesting companies with APTS provide more information in their tax

footnotes than companies without APTS. Results in Table 3 collectively provide some initial evidence of a positive association between APTS and the quality of companies' tax disclosures.

We also provide correlations among the main variables in Table 4. We find negative (positive) correlations between *APTS* and *FOG (LENGTH)* and *FKGL* (p -value < 0.01). This result confirms the pattern observed in Table 3. Finally, we find negative (positive) correlations between *TAXEXPERT* and *BIG4* and the readability (length) measures (p -value < 0.01). There are also positive correlations between *TAXEXPERT* and *BIG4* and *APTS* (p -value < 0.01). These correlations provide initial support for the notion that *TAXEXPERT* and *BIG4* could potentially affect the association between APTS and the quality of tax disclosure.

Insert Tables 3 and 4 here

Regression Analyses

APTS and the Quality of Tax Disclosure (H1)

As discussed in the research design section, we first estimate Model (1) to examine the association between APTS and tax disclosure. Table 5 reports the results.

Results indicate that companies purchasing APTS have more readable income tax footnotes, suggesting that APTS improves the quality of companies' tax disclosures. Specifically, we observe a negative and significant *APTS* coefficient when *FOG* (Estimate = -0.361, p -value = 0.044) and *FKGL* (Estimate = -0.328, p -value = 0.061) are dependent variables. The *APTS* coefficient estimates in the *FOG* and *FKGL* regressions are approximately 1.31% and 1.41% of their means, respectively. We do not observe a significant *APTS* coefficient when *LENGTH* (Estimate = 0.016, p -value = 0.262) is the dependent variable.⁷ These results support the notion that purchasing APTS results in more readable, higher-quality tax disclosures.

⁷ After addressing the imbalance between the *APTS* group and the *NONAPTS* group, results for *LENGTH* in Table 6 are significant.

Examining the parameter estimates of the controls in the *FOG* regression, we observe a negative and significant *SIZE* coefficient (Estimate = -0.328, p -value < 0.001), suggesting that larger companies have more resources to improve income tax footnote readability. A positive *INTAN* coefficient (Estimate = 0.855, p -value = 0.034) indicates that companies with more intangible assets are reluctant to disclose sensitive information in their tax footnotes. A negative *NOL* coefficient (Estimate = -1.767, p -value < 0.001) indicates that companies with net operating losses have more detailed tax footnotes, suggesting that these companies tend to explain the underlying tax strategies more. A positive *ROA* coefficient (Estimate = 3.256, p -value = 0.001) and a negative *ACC* coefficient (Estimate = -2.218, p -value = 0.004) suggest that profitability and financial reporting aggressiveness affect the readability of tax footnotes. Finally, negative *TAXCONTENT1* (Estimate = -0.325, p -value < 0.001) and *TAXCONTENT2* (Estimate = -0.138, p -value = 0.008) coefficients indicate that companies increase the quality of tax disclosures by disclosing more information about their tax planning and tax accounts related to future benefits and uncertainty.

Insert Table 5 here

Inverse Probability Weighted Regression Adjustment

The baseline OLS regression results support the notion of a positive association between APTS and tax disclosure quality. However, as we acknowledged previously, clients' purchase of APTS is not random, which could impair the ability to identify APTS's average treatment effect. Thus, it is unclear to what extent between-group covariate differences confound observed results from the OLS regression. IPWRA helps address this issue by weighting the treatment and control groups using the inverse of the propensity for treatment (D'Agostino 1998; Austin and Stuart 2015). This methodology helps remove the effect of differences between the two groups other than

the treatment itself. Thus, by ruling out potentially confounding effects, IPWRA allows measurement of the average treatment effect of APTS while minimizing the effect of differences between the two groups. Equally important, IPWRA allows the balancing of more than two groups simultaneously, improving our ability to test for differences in outcomes among more than two groups simultaneously.

We use Model (2) to estimate propensity scores in the first stage. The treatment variable indicates whether an auditor also provides tax services, and we use the propensity scores to weight the treatment and control company covariates. In the second stage, we estimate ATE and ATET on the quality of income tax footnotes using the weighted samples.

Table 6 reports the IPWRA results.⁸ Results in Panel A suggest that the weighted covariates for the treatment (*APTS*) and control (*NONAPTS*) companies are balanced. Panel B reports estimates of ATE and ATET. The results suggest that income tax footnotes for companies with APTS are more readable than those without APTS (ATE = -0.403, *z*-statistic = -3.53; ATET = -0.424, *z*-statistic = -4.07). The ATE (ATET) for *FOG* is 1.46% (1.54%) of its mean in magnitude. Results are similar when using *FKGL* as the dependent variable. Notably, results on *LENGTH* suggest that companies with APTS have more extensive tax footnotes than companies without APTS (ATE = 0.026, *z*-statistic = 2.75; ATET = 0.029, *z*-statistic = 2.94). The ATE (ATET) for *LENGTH* is 0.91% (1.02%) of its mean in magnitude. Overall, these results confirm OLS results that APTS improves tax disclosure.

Insert Table 6 here

⁸ The same sample is used in both methodologies. In Table 6, Panel A and B, the total number of the observations is 21,178, which equals the sum of the observations in the treatment group (11,426) and the observations in the control group (9,752).

Cross-Sectional Variation

Tax-Expert Auditor, APTS, and Tax Disclosure (H2)

This section examines whether the association between APTS and tax disclosure varies by auditors' tax expertise. Following McGuire et al. (2012), we use APTS market share (i.e., total tax fees paid to the auditor divided by total tax fees paid to all other auditors) in the same industry and city for tax expertise. We define an external auditor as a tax expert (*TAXEXPERT*) when its APTS share in a given city and industry (two-digit SIC) equals or exceeds 30 percent. We apply multi-level IPWRA to estimate the treatment effect of APTS provided by tax experts (*TAXEXPERTAPTS*) relative to APTS provided by non-tax experts (*NONTAXEXPERTAPTS*) and companies without APTS (*NONAPTS*). The control group consists of companies without APTS (*NONAPTS*). The first treatment level is *NONTAXEXPERTAPTS* and represents the effect of APTS on tax disclosure provided by non-tax expert audit firms. The second treatment level is *TAXEXPERTAPTS* and represents the effect of APTS provided by tax expert audit firms on tax disclosure.

A significant negative ATE/ATET between these two treatment levels and the control group indicates differences in the readability of tax disclosures between *NONAPTS* companies and *APTS* companies (either provided by tax experts or non-tax expert audit firms). If both treatment effects are significant, this reduces concerns that the OLS and initial IPWRA estimates relate to tax expert audit firms' effect only. To examine whether the effect of APTS on tax disclosure is stronger for tax expert audit firms than for non-tax expert audit firms, we estimate the ATE/ATET of *TAXEXPERTAPTS* relative to *NONTAXEXPERTAPTS*. A negative significant ATE/ATET on *TAXEXPERTAPTS* could suggest that the association between APTS and tax disclosure is stronger

for tax expert audit firms providing APTS than non-tax expert audit firms providing APTS. Table 7 presents these results.

Results in Table 7 suggest that the average treatment effects at the first (*NONTAXEXPERTAPTS*) and the second (*TAXEXPERTAPTS*) treatment levels are negative and significant relative to non-APTS firms. Compared with the tax footnote readability (*FOG*) of companies without APTS, the tax footnote readability is significantly higher in companies with APTS provided by nontax expert audit firms (ATE = -0.345, *z*-statistic = -2.84; ATET = -0.247, *z*-statistic = -2.39). For economic magnitude, the ATE (ATET) for *FOG* is 1.26% (0.90 %) of its mean. Similarly, the tax footnote readability is significantly higher for companies with APTS provided by tax expert audit firms than those without APTS (ATE = -0.893, *z*-statistic = -1.45; ATET = -1.298, *z*-statistic = -8.15). The economic magnitude of ATE (ATET) for *FOG* is 3.24% (4.71%) of its mean. When *LENGTH* is the dependent variable, we also observe that the ATE/ATET of *NONTAXEXPERTAPTS* (*TAXEXPERTAPTS*) relative to non-APTS firms are positive and significant (ATE = 0.025 (0.093), *z*-statistic = 2.52 (5.90); ATET = 0.020 (0.082), *z*-statistic = 2.10 (6.51)). Regarding economic magnitude, the ATE/ATET for *LENGTH* is 0.88% (3.27 %)/ 0.70% (2.88%) of its mean. The results support that APTS, regardless of audit firm expertise, improves companies' tax disclosures by disclosing more information in tax footnotes and making tax footnotes more readable.

More importantly, results suggest a difference between the two treatment levels. When *FOG* is the dependent variable, the ATE (ATET) of *TAXEXPERTAPTS* is negative and significant (ATE = -0.689, *z*-statistic = -4.01; ATET = -0.304, *z*-statistic = -2.22). The economic magnitude of ATE (ATET) for *FOG* is 2.50% (1.11%) of its mean. This result suggests that the association between APTS provision and the quality of companies' tax disclosures is stronger when tax expert

audit firms provide APTS than when non-tax expert audit firms provide APTS. We observe similar results using *FKGL* as the dependent variable. When *LENGTH* is the dependent variable, we observe that the ATE (ATET) of *TAXEXPERTAPTS* is positive and significant (ATE = 0.050, z-statistic = 3.85; ATET = 0.035, z-statistic = 2.99). The economic magnitude of ATE (ATET) for *LENGTH* is 1.76% (1.23%) of the mean. Collectively, results in Table 7 suggest that both tax expert and non-tax expert audit firms providing APTS improve tax disclosure. They also suggest that quality differences exist between tax expert and non-expert audit firms that provide APTS to clients.

Insert Table 7 here

Big4 Audit Firms, APTS, and Tax Disclosure (H3)

In this section, we examine the role of Big4 auditors in the association between APTS and tax disclosure. Following prior literature (e.g., Christensen et al. 2015), we define *BIG4*, an indicator variable, as one if an audit firm is one of the Big4 and zero otherwise. We apply multi-level IPWRA to estimate the effect of APTS provided by a Big4 audit firm (*BIG4APTS*). The control group continues to be companies that do not purchase APTS (*NONAPTS*). The first treatment level is APTS provided by non-Big4 firms (*NONBIG4APTS*). The second treatment level is APTS provided by Big4 firms (*BIG4APTS*). To directly evaluate H3, we use *NONBIG4APTS* as the control group and estimate the ATE (ATET) of *BIG4APTS* relative to *NONBIG4APTS*. Negative and significant ATE/ATET for *FOG* and *FKGL* (*LENGTH*) tests would suggest the association between APTS provision and the quality of tax disclosure is stronger when Big4 audit firms provide APTS.

Results in Table 8 suggest that APTS provision by Big4 firms improves the quality of clients' tax disclosures. *FOG* is significantly lower for *BIG4APTS* than companies without APTS

(ATE = -0.478, z -statistic = -3.86; ATET = -0.486, z -statistic = -2.18). The economic magnitude of ATE (ATET) for *FOG* is 1.74% (1.77%) of its mean. *LENGTH* is significantly greater for *BIG4APTS* than companies without APTS (ATE = 0.067, z -statistic = 6.27; ATET = 0.090, z -statistic = 4.30). The economic magnitude of ATE (ATET) for *LENGTH* is 2.35% (3.16%) of its mean. Results also suggest no significant difference in *FOG* (ATE = 0.353, z -statistic = 1.00; ATET = 0.339, z -statistic = 1.18) or *LENGTH* (ATE = -0.015, z -statistic = -0.57; ATET = -0.023, z -statistic = -1.15) between *NONBIG4APTS* and *NONAPTS*.

To directly examine H3, we use *NONBIG4APTS* as the control group and *BIG4APTS* as the treatment group. Results suggest that Big4 APTS providers appear to improve companies' tax disclosures more than non-Big4 APTS providers (ATE = -1.161, z -statistic = -2.45; ATET = -1.061, z -statistic = -2.01). The economic magnitude of ATE (ATET) for *FOG* is 4.22% (3.86%) of its mean. This result is consistent with prior literature indicating higher quality services provided by Big4 audit firms. We observe similar results using *FKGL* as the dependent variable. Finally, companies with Big4 APTS provide marginally more extensive tax footnotes than non-Big4 APTS (ATE = 0.062, z -statistic = 1.29; ATET = 0.038, z -statistic = 0.74). The economic magnitude of ATE for *LENGTH* is 2.18% of its mean. Overall, Table 8 supports the third hypothesis that the association between APTS and the quality of companies' tax disclosures is stronger for Big4 APTS providers.⁹

Overall, this section suggests that the audit firm APTS provision improves companies' tax disclosures, consistent with the benefits of communication between tax and audit teams. A stronger

⁹ To address the concern that the effect of the Big4 APTS provision is driven by tax expert APTS providers, we estimate the ATE/ATET of *BIG4APTS* relative to *NONBIG4APTS* in the non-tax expert group. We continually observe a lower ATE/ATET of *BIG4APTS* (ATE = -1.088, z -statistic = -2.55; ATET = -0.967, z -statistic = -1.98) relative to *NONBIG4APTS*. These results confirm the association between APTS and tax disclosure is stronger when the APTS is provided by a Big4 audit firm.

association between APTS provision and the quality of tax disclosure for tax expert audit firms suggests that tax expert audit firms have more industry-specific expertise than non-tax expert audit firms. Finally, Big4 audit firms improve clients' tax disclosures more than non-Big4 audit firms, suggesting Big4 audit firms have more resources and expertise than non-Big4 audit firms (DeAngelo 1981).

Insert Table 8 here

V.ADDITIONAL ANALYSES

The results of the previous section suggest that APTS improves tax disclosure quality by increasing the readability of disclosing more information in tax footnotes. In this section, we provide robustness through two alternative empirical designs that exploit changes in APTS. We also conduct two convergent validity tests to examine the association between APTS and tax footnote content disclosure and tax disclosure during earnings conference calls. Both constructs should improve if APTS improves the overall quality of clients' tax disclosures.

Difference-in-Differences

In 2005, KPMG entered a Deferred Prosecution Agreement (DPA) with the U.S. Department of Justice (Browning 2005). According to terms in the DPA, KPMG must “comply with a set of minimum opinion and return position thresholds stricter than those required of other tax service providers” (Finley and Stekelberg 2016). Consistent with the terms in the DPA, Finley and Stekelberg (2016) find that clients terminated or reduced purchasing APTS from KPMG following the DPA. Following Finley and Stekelberg (2016), we use a difference-in-differences design. Specifically, we estimate the following regression (we omit firm and year subscripts for brevity) in two subsamples (*Terminating APTS* and *Non-Terminating APTS*):

$$LESSREADABLE = \alpha + \beta_1 KPMGAPTS \times POST + \beta_2 KPMGAPTS + \beta_3 POST + \gamma_k Controls \quad (3)$$

LESSREADABLE is an indicator variable if a tax footnote became less readable (i.e., Fog index increased from year t to year $t+1$), and zero otherwise. *KPMGAPTS* is an indicator variable for firms with KPMG as their external APTS provider before the DPA and zero for any other Big4 auditor. *POST* is one for the three years following the DPA (i.e., 2006–2008) and zero for the three years preceding the DPA (i.e., 2002–2004). We followed Finley and Stekelberg (2016) to ensure all DPA terms were effective, and we excluded 2005 from the analysis.¹⁰ The subsample of *Terminating APTS* contains firms that were KPMG’s clients in 2004 (i.e., the year right before the DPA) and completely dropped APTS in 2006 (i.e., the year right after the DPA).¹¹ A positive and significant coefficient on $KPMGAPTS \times POST$ in the *Terminating APTS* subsample would suggest that KPMG clients that terminated APTS provide less readable tax footnotes following the DPA. The subsample of *Non-Terminating APTS* serves as the control group.

Table 9 reports the result. In the subsample of *Terminating APTS*, we observe a positive and significant $KPMGAPTS \times POST$ coefficient (Estimate = 0.459, p -value = 0.002), suggesting that, when KPMG clients terminated APTS, their tax footnotes became less readable following the DPA. On the other hand, we observe an insignificant $KPMGAPTS \times POST$ coefficient (Estimate = -0.025, p -value = 0.494) in the subsample of *Non-Terminating APTS*. These results collectively support that APTS affects firms’ tax disclosure, reinforcing the IPWRA findings in the previous section.

Insert Table 9 here

¹⁰ Some of the DPA terms did not take effect until February 2006 (Finley and Stekelberg 2016).

¹¹ Results hold when we alternatively define the *Terminating APTS* subsample to include firms that were KPMG clients in 2004 and completely dropped APTS for the entire post period (2006-2008) or include firms that were KPMG clients in the any of three years (2002-2004) but completely dropped KPMG-provided APTS in 2006.

Changes Analysis

We also use a change specification to identify the effect of APTS on tax disclosure. Specially, we estimate the following regression (we omit firm and year subscripts for brevity):

$$\Delta TaxDisclosureQuality = \alpha + \beta_1 APTSINCREASE + \gamma_k \Delta controls + \eta \quad (4)$$

$\Delta TaxDisclosureQuality$ is the change in the three tax footnote readability measures from year $t-1$ to year $t+1$.¹² $APTSINCREASE$ equals 1 for firms that experienced an increase in APTS from year $t-1$ to year t , and 0 otherwise. A negative (positive) and significant β_1 , when ΔFOG and $\Delta FKGL$ ($\Delta LENGTH$) are the dependent variables, suggests that firms that experienced an increase in APTS are more likely to provide more (less) readable tax footnotes.

Table 10 reports the results. Results indicate that firms that experienced an increase in APTS tend to provide more readable tax footnotes and more information in their tax footnotes. Specifically, the coefficients on $APTSINCREASE$, when ΔFOG (Estimate = -0.303; p -value = 0.046) and $\Delta FKGL$ (Estimate = -0.281; p -value = 0.029) are the dependent variables, indicate significant improvement in the tax footnotes readability. The positive coefficient on $APTSINCREASE$ (Estimate = 0.020; p -value = 0.020) when $\Delta LENGTH$ is the dependent variable indicates firms provide more information in their income tax footnotes. These results suggest that tax footnote readability improves when firms procure more APTS.

Insert Table 10 here

The Moderating Effect of Office-Level Distraction

In the preceding sections, we provide evidence that APTS at the firm level improves firms' tax disclosures via communication between audit and tax teams within the same audit firm. Beardsley et al. (2021) find that overemphasizing non-audit services at an audit-office level

¹² As a sensitivity test, we also define $\Delta TaxDisclosureQuality$ as the change in any of three tax footnote readability measures from year $t-1$ to year t . Untabulated results are consistent.

impairs audit quality. They attribute their finding to audit offices being distracted from providing a high-quality audit by allocating more resources to NAS. We recognize that the possibility of greater NAS distracting auditors from providing higher-quality audits could moderate the positive association we observe between APTS and income tax footnote quality. To this end, we examine the potential moderating effect of greater NAS on the association between APTS and tax disclosure quality.

We apply IPWRA to examine the role of distracted audit offices in the association between APTS and tax disclosure.¹³ Because the distraction effect is at the audit-office level, we follow Beardsley et al. (2021) and define distracted audit offices as those in the top quartile of the ratio of total NAS fees to all other audit clients' total fees in the audit-office portfolio. The treatment group comprises companies with APTS from distracted offices (*Distracted_Office_APTS*), and the control group includes companies with APTS from undistracted offices (*Undistracted_Office_APTS*). We define the dependent variable *Hard_to_Read* for tax footnotes with the highest decile of the *FOG* index. A significant positive ATE/ATET between the treatment and control groups is consistent with the moderating effect of NAS distraction on the association between APTS and tax disclosure.

Results in Table 11 suggest that the average treatment effect of distracted offices is positive and significant relative to undistracted offices. Compared with the tax footnotes of companies with APTS from undistracted offices (*Undistracted_Office_APTS*), tax footnotes are significantly harder to read in companies with APTS from distracted offices (ATE = 0.040, z-statistic = -3.27; ATET = 0.047 z-statistic = 3.25). This result suggests that the distraction effect moderates the positive influence of APTS on tax footnote readability. We also examine the difference between

¹³ In untabulated tests, we observe similar inferences if we use a logit model to examine the moderating role of the distraction effect.

firms with APTS from undistracted offices and companies without APTS to provide more evidence. We observe a negative ATE/ATET (ATE = -0.020, z-statistic = -2.12; ATET = -0.016 z-statistic = -2.23), consistent with our main results highlighting a positive relation between APTS and tax disclosure quality. These results suggest that when office-level distraction is low, APTS is associated with higher-quality tax footnote disclosure. However, when the NAS exceeds about 22% of the total fees at the audit office level, the office-level distraction moderates the positive effect of APTS on tax disclosure quality.

Insert Table 11 here

Within-Industry Variation in Tax Disclosure Quality

Greater variation in tax footnote disclosure quality within an industry could moderate the effect of APTS on tax disclosure quality, rendering it more difficult for auditors to discern appropriate industry-peer benchmarks for tax disclosure quality. Thus, to the extent that greater within-industry variation (or ‘noise’) in disclosure quality makes it difficult for auditors or investors to assess firms’ disclosure quality, we expect the relation between APTS and tax footnote disclosure readability attenuated in the presence of higher within-industry variation in disclosure quality.

We apply IPWRA to examine the moderating role of within-industry variation in tax disclosure quality. We create an indicator variable, *Noisy Industry*, which is 1 for industries with a top quartile (the highest 25%) standard deviation of the *FOG* index within the industry year. Otherwise, it is 0. Results in Table 12 suggest that industry noise moderates the association between APTS and tax disclosure quality. More specifically, compared with the tax footnote readability (*FOG*) of companies from a less noisy industry and with APTS (*Less Noisy Industry* *_APTS*), the tax footnote readability (*FOG*) is significantly lower in companies with APTS and

from a noisy industry (*Noisy Industry _APTS*) (ATE = 0.781, z-statistic = 2.14; ATET = 3.013, z-statistic = 11.58). This result is consistent with greater within-industry variation moderating the positive association between APTS and tax disclosure quality.

We further examine the difference between companies from a less noisy industry with and without APTS. We observe a negative ATE(ATET) (ATE = -1.389, z-statistic = -11.03; ATET = -0.849, z-statistic = -10.85), consistent with our main results revealing a positive association between APTS and tax footnote readability when within-industry variation in tax disclosure quality is low. Finally, when we compare the difference between companies from a noisy industry but with and without APTS, the ATE(ATET) becomes insignificant (lower) (ATE = -0.148, z-statistic = -0.29; ATET = -0.812, z-statistic = -1.73), suggesting that the positive association between APTS and tax footnote quality attenuates in the presence of greater within-industry variation in tax disclosure quality. These results highlight the moderating role of industry variation in the relation between APTS and tax disclosure readability. It suggests that the benefits of APTS for tax disclosure are less discernible to outside observers when the within-industry variation in tax disclosure quality is high.

Insert Table 12 here

The Content of Tax Footnotes

For the tax footnote content construct, we focus on the content describing companies' tax benefits (uncertainty) and tax planning strategies. We use six tax-related words or phrases to represent this content in tax footnotes: tax jurisdiction, tax uncertainty, valuation allowance, tax benefits, international subsidiaries, and foreign sales. The phrases "tax jurisdiction," "tax uncertainty," and "tax benefits" capture information about how companies describe the uncertainty of their tax positions. This uncertainty arises from the number of jurisdictions and expectations

about future taxable income, international subsidiaries, and foreign sales representing income-shifting opportunities. With more readability (length), we expect more tax-related phrases for companies with APTS than those without APTS.

In the untabulated results, we observe a positive and significant difference in the frequency of phrases containing tax between companies with and without APTS (p -value < 0.01), suggesting that overall, companies with APTS mention more tax-related words than companies without APTS. A significant difference in the mean frequency of phrases containing tax jurisdiction, foreign tax, and foreign subsidiaries between the two groups (p -value < 0.01) suggests that companies purchasing APTS provide more information on tax planning and strategies. Companies purchasing APTS also mentioned more information about tax uncertainty and tax benefits than companies not purchasing APTS (p -value < 0.01). This result suggests that APTS could provide greater confidence in tax avoidance activities, allowing companies to disclose more information about company value. Finally, we observe significant differences in the frequency of phrases related to the valuation allowance. This result suggests that companies purchasing APTS discuss more detailed information about tax activities than companies without APTS. Together, these results provide evidence that APTS improves companies' tax disclosure by providing more tax-related information.

To further illustrate the differences in tax footnote disclosures between *APTS* companies and *NONAPTS* companies, we provide three pairs of representative examples of income tax footnotes in Appendix A. These examples compare tax footnotes between *NONAPTS* and *APTS* companies in the same year, the same company before and after purchasing APTS, and the same company before and after increasing APTS significantly. In 2012, Monsanto, a company with \$2,900,000 in auditor-provided services, provided detailed and clear explanations of how it

generated NOLs and the justification for the established valuation allowances. In the same year, Kewaunee Scientific Corporation, with no auditor-provided tax services, only disclosed required tables with two general statements despite reporting valuation allowances.

We also observe similar patterns when comparing the same company before and after purchasing APTS. For example, after purchasing APTS in 2005, Gannett provided tables with domestic and foreign tax components and tables with federal, state, and foreign tax. Finally, after a significant increase in auditor-provided services from \$3,302 in 2007 to \$354,627 in 2011, Ennis explained the valuation allowance and net operating loss carry forward in a more detailed fashion in 2011 than in 2007. These examples illustrate differences in APTS across companies' tax disclosures. Of course, given this anecdotal evidence's small and non-random nature, we are careful not to overgeneralize.

Tax Disclosure during Earnings Conference Calls

The tax footnote, a part of the 10-K, is a mandatory tax disclosure. Managers could also choose to disclose tax-related information during earning conference calls. APTS helps companies apply more effective tax strategies and avoid more tax payments (Christensen et al. 2015), increasing managers' confidence in their tax strategies. Thus, managers could mention more tax-related information in earnings conference calls. This section examines whether APTS associates with managers' non-mandatory tax disclosure. Specifically, we use two measures to represent tax mentioned during earnings conference calls. We use an indicator variable representing whether a manager mentions tax-related words in an earnings conference call. The other is the number of times the mention of the word tax occurs in an earnings conference call. We expect that managers of companies purchasing APTS mention tax more frequently during earnings conference calls.

Untabulated results reveal that companies purchasing APTS tend to mention tax and convey more tax-related information during earnings conference calls (Estimate = 0.528, p -value < 0.01). We also apply IPWRA to confirm the results. Untabulated results indicate a significant difference in tax-related words mentioned in earnings conference calls between companies purchasing APTS and companies not purchasing APTS (ATE = 0.185, z -statistic = 3.03; ATET=0.214, z -statistic = 3.12; ATE = 0.104, z -statistic = 3.58; ATET =0.118, z -statistic = 3.98). The ATE (ATET) for the natural log of the number of tax-related words is 14.34% (9.15%) of its mean in terms of economic magnitude. Collectively, results in this section suggest an association between APTS and companies' non-mandatory tax disclosures and validate that APTS improves the quality of tax disclosures.

Tax Disclosure and Analyst Forecast Errors

Prior literature suggests that tax-related information is important to different capital market participants. For example, Shane and Stock (2006) find that analysts fail to anticipate tax-related earnings management when they cannot recognize the tax-motivated income shifting. Amir and Sougiannis (1999) find that when analysts do not fully understand certain tax-related information, including deferred taxes from carryforwards and valuation allowances, their earnings forecast could be more biased and less precise. A question related to this literature is whether the quality of tax discourse matters to capital market participants. Luo et al. (2023) find that qualitative information in tax footnotes improves firm value. To this end, we examine the association between tax footnote readability and analyst forecast errors. Given the complexity of the tax-related information and the difficulty in incorporating it in analysts' forecasts (Shane and Stock 2006), we expect more readable tax footnotes to increase analysts' understanding of the tax-related components of earnings, leading to reduced earnings forecast errors. Following Francis, Neuman,

and Newton (2019), we define analysts' forecast error (*AFE*) as the absolute value of the difference between the mean EPS one year ahead forecast and EPS realized scaled by the stock price at the time of the forecast issuance. We define the independent variable (*EASYTOREAD*) as an indicator variable that is 1 when a firm's tax footnote readability is in the bottom quintile of the year-adjusted *FOG* and 0 when a firm's tax footnote readability is in the top quintile of the year-adjusted *FOG*.

We estimate the following regression (we omit firm and year subscripts for brevity):

$$AFE = \alpha + \beta_1 EASYTOREAD + \gamma_k \Delta Controls + \eta \quad (5)$$

A negative and significant β_1 could suggest analyst forecast errors are lower (more accurate) for firms with more readable tax footnotes. The untabulated results indicate a negative and significant *EASYTOREAD* coefficient (Estimate = -0.0003, *p*-value = 0.046), indicating a negative association between the tax footnote readability and analyst forecast errors. This result suggests that high-quality tax disclosures help analysts understand the tax-related components of reported earnings, leading to more accurate earnings forecasts. This result provides direct evidence of the quality of tax disclosure matters to capital market participants.

VI. CONCLUSION

This study examines the association between APTS and the quality of tax disclosure. Prior literature documents that tax teams and audit teams within the same audit firm frequently communicate with each other, improving audit quality through knowledge spillover. Prior literature also documents that APTS can distract auditor attention, which may lead to a degradation in disclosure quality. Given these countervailing arguments, we examine whether APTS affects the quality of companies' tax disclosures.

Because clients' purchase of APTS is not random, we use an IPWRA design to examine whether companies purchasing APTS have higher quality tax disclosures. Results suggest that

APTS improves tax disclosure, supporting the knowledge sharing between audit and tax teams benefits clients. We also find that companies purchasing APTS from a tax expert audit firm have higher quality tax footnotes than companies purchasing APTS from non-tax expert audit firms and companies that do not purchase APTS. We examine whether companies purchasing APTS from a Big4 audit firm have higher tax disclosure quality. Results suggest that clients of Big4 APTS providers have higher quality tax disclosures than clients of non-Big4 APTS providers. We further document that when the NAS exceeds 22% of the audit-office fees, NAS office-level distraction moderates the positive association between APTS and tax disclosure quality. We also find that the within-industry variation in tax disclosure quality (noise) moderates the association between APTS and tax disclosure quality.

To assess whether other tax disclosure characteristics simultaneously improve the quality of tax footnotes, we examine two additional dimensions that might relate to APTS provision. First, we examine the association between APTS and the information content of tax footnotes. Results indicate that companies with APTS discuss more information about their tax planning and tax accounts related to future benefits and uncertainty. We also find that managers of companies purchasing APTS discuss more tax-related information during earnings conference calls than managers of companies without APTS. These results suggest that APTS improves both mandatory and voluntary tax disclosures. Finally, we provide evidence that analysts' forecast errors are lower for companies with more readable tax footnotes.

This study makes the following contributions. First, it extends the literature on the knowledge-sharing effect of APTS on audit quality by showing the knowledge-sharing effect of APTS from the perspective of tax disclosure quality. More importantly, the association between APTS and tax disclosure quality changes depends on certain factors, including, tax expertise,

office-level distractions, and the level of industry benchmark salience. Second, it contributes to the tax literature by providing evidence of the association between APTS and the quality of companies' disclosures of their tax avoidance activities. This evidence complements the current literature on the effect of APTS on what firms do regarding tax avoidance activities. In addition, there is growing interest from regulators and policy makers regarding ways to improve tax disclosure quality. Thus, our study should interest analysts, investors, policymakers, and researchers.

REFERENCES

- Abernathy, J., F. Guo, T. Kubick, and A. Masli. 2019. Financial Statement Footnote Readability and Corporate Audit Outcomes. *Auditing: A Journal of Practice & Theory* 38(2): 1-26.
- Amir, E., and T. Sougiannis. 1999. Analysts' interpretation and investors' valuation of tax carryforwards. *Contemporary Accounting Research* 16 (1): 1–33.
- AS 1001. <https://pcaobus.org/oversight/standards/auditing-standards/details/AS1001>
- Auditing Standards Section 551. <https://pcaobus.org/oversight/standards/archived-standards/details/AU551#:~:text=An%20auditor's%20report%20on%20information%20accompanying%20the,same%20objective%20as%20an%20auditor's%20report%20on>
- Austin, P.C. and E. Stuart. 2015. Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies. *Statistics of Medicine* 34 3661-3679
- Balakrishnan, K., J. Blouin, and W. Guay. 2019. Tax Aggressiveness and Corporate Transparency. *The Accounting Review* 94(1): 45-69.
- Baldwin, J., A. Blankley, D. Hurtt, and J. MacGregor. 2023. *The Relationship between SEC Comment Letters and Subsequent Auditor Change*. Working paper, Baylor University, Samford University.
- Beardsley, E., A. Indieke, and T. Omer. 2021. The distraction effect of non-audit services on audit quality, *Journal of Accounting and Economics* 71: 2–3.
- Beck, P. J., T. J. Frecka, and I. Solomon. 1988. A model of the market for MAS and audit services: Knowledge spillovers and auditor-auditee bonding. *Journal of Accounting Literature* 7: 50-64.
- Beck, P. J.; J. S. Davis; and W.O. Jung. 2000. Taxpayer Disclosure and Penalty Laws. *Journal of Public Economic Theory* 2: 243–72.
- Bloomfield, R. J. 2002. The “incomplete revelation hypothesis” and financial reporting. *Accounting Horizons* 16(3):233–243. <https://doi.org/10.2308/acch.2002.16.3.233>
- Bonner, S., J. Davis, and B. Jackson. 1992. Expertise in corporate tax planning: The issue at the identification stage. *Journal of Accounting Research* 30 (Supplement): 1–28.
- Bozanic, Z, J. Hoopes, J. Thornock, and B. Williams. 2017. IRS Attention. *Journal of Accounting Research* 55(1): 79-114.
- Bratten, B., C. Gleason, S. Larocque, and L. Mills. 2017. Forecasting Taxes: New Evidence from Analysts. *The Accounting Review*: 92 (3): 1-29.
- Browning, L. 2005. *KPMG says tax shelters involved wrongdoing*. The New York Times (June 17). <https://www.nytimes.com/2005/06/17/business/kpmg-says-tax-shelters-involved-wrongdoing.html>
- Brushwood, J., D. Johnston, L. Kutcher, and J. Stekelberg. 2019. Did the FASB’s simplification initiative increase errors in analysts’ implied ETR forecasts? Evidence from early adoption of ASU 2016-09. *Journal of the American Taxation Association* 41 (2): 31–53.
- Cameron, A. C, and D. Miller. 2015 A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources*: 50 (2): 317-373.
- Callen, J. L., M. Khan, and H. Lu. 2013. Accounting quality, stock price delay and future stock returns. *Contemporary Accounting Research* 30 (1): 269-295.
- Christensen, B. E., A. J. Olson, and T. C. Omer. 2015. The role of audit firm expertise and knowledge spillover in mitigating earnings management through the tax accounts. *Journal of the American Taxation Association* 37 (1): 3-36.

- Chyz, J., R. Gal-Or, V. Naiker, and D Sharma. 2021. The Association between Auditor Provided Tax Planning and Tax Compliance Services and Tax Avoidance and Tax Risk. *The Journal of the American Taxation Association*. 43 (2): 7–36.
- Cook, K., G. Huston, and T. Omer 2008. Earnings management through effective tax rates: The effects of tax-planning investment and the Sarbanes-Oxley Act of 2002. *Contemporary Accounting Research*. 25: 447–471.
- Cook, K. A., K. Kim, and T. Omer. 2020. The Cost of Independence: Evidence from Companies' Decisions to Dismiss Audit Firms as Tax-Service Providers. *Accounting Horizons*. 34 (2): 83-107.
- Czerney, K., L. Lisic., B. Wu., and I. Zhang 2020. *Big Four Auditors, Litigation Risk, and Disclosure Tone*. Working paper. University of Missouri-Columbia, Virginia Polytechnic Institute & State University, University of Nebraska-Lincoln, and University of California, Riverside.
- D' Agostino R. B. Jr. 1998. Tutorial in Biostatistics Propensity Score Methods for Bias Reduction in the Comparison of a Treatment to a Non-Randomized Control Group. *Statistics in Medicine*. 17 2265-2281
- De Franco, G., M. H. Wong, and Y. Zhou. 2011. Accounting adjustments and the valuation of financial statement note information in 10-K filings. *The Accounting Review* 86 (5): 1577–1604. <https://doi.org/10.2308/accr-10094>
- Deloitte. 2012. SEC Comment Letter Examples: Income Taxes. Available at: <http://www.iasplus.com/en-us/publications/us/sec-cl/sixthedition>
- De Simone, L., M. Ege, and B. Stomberg. 2015. "Internal control quality: The role of auditor-provided tax services." *The Accounting Review* 90(4): 1469-1496.
- Dhaliwal, D., C. Gleason, and L. Mills. 2004. Last-chance earnings management: Using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research* 21, 431-459.
- Dhaliwal, D., S. Huang, W. Moser, and R. Pereira. 2018. *Corporate Tax Avoidance and the Level and Valuation of Firm Cash Holdings*. Working paper, The University of Arizona. Arizona State University, Miami University, and University of Missouri at Columbia.
- Dopuch, N., and R. R. King. 1991. The impact of MAS on auditors' independence: An experimental markets study. *Journal of Accounting Research* 29 (Supplement): 60-98.
- Dougal, C., J. Engelberg, D. Garcia, and C. Parsons. 2012. Journalists and the stock market, *Review of Financial Studies* 25: 639–679.
- Ernst & Young (E&Y). 2011. *2011–12 Tax Risk and Controversy Survey*. Available at: [https://www.ey.com/Publication/vwLUAssets/20112012_Tax_risk_and_controversy_report/\\$FILE/2011-2012_Tax_risk_and_controversy_report.pdf](https://www.ey.com/Publication/vwLUAssets/20112012_Tax_risk_and_controversy_report/$FILE/2011-2012_Tax_risk_and_controversy_report.pdf).
- Ernst & Young (E&Y). 2020. Highlights of trends in 2020 SEC comment letters. Available at: https://www.ey.com/en_us/assurance/accountinglink/sec-reporting-update---highlights-of-trends-in-2020-sec-comment-.
- Ertugrul, M., J. Lei, J. Qiu, and C. Wan. 2017. Annual report readability, tone ambiguity, and the cost of borrowing. *Journal of Financial and Quantitative Analysis*. 52 (2): 811–836. <https://doi.org/10.1017/S0022109017000187>
- Financial Accounting Standards Board. 2016. Proposed Accounting Standards Update (ASU) 740. Available at: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage&cid.
- Financial Accounting Standards Board. 2018. Conceptual Framework for Financial Reporting Chapter 8, Notes to Financial Statements. Available at:

- https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176171111790&acceptedDisclaimer=true
- Financial Accounting Standards Board. 2019. Proposed Accounting Standards Update (ASU) 740. Available at: <https://www.fasb.org/jsp/FASB/Page/SectionPage&cid>.
- Financial Accounting Standards Board. 2023. Improvements to Income Tax Disclosures. Available at: <https://www.fasb.org/Page/ProjectPage?metadata=fasb-Targeted%20Improvements%20to%20Income%20Tax%20Disclosures>.
- Finley, A., and J. Stekelberg. 2016. The Economic Consequences of Tax Service Provider Sanctions: Evidence from KPMG's Deferred Prosecution Agreement. *Journal of American Taxation Association*, 38(1): 57-78.
- Fox, Z.D., Wilson, R. 2023. Double trouble? IRS's attention to financial accounting restatements. *Rev Account Stud*). 28, 2002–2038. <https://doi.org/10.1007/s11142-022-09680-6>
- Francis, T. 2014. *To Be Clear, SEC Reviewers Want Filings in Plain English, Period*. Available at: <https://www.wsj.com/articles/to-be-clear-sec-reviewers-want-filings-in-plain-english-period-1410555347>
- Monga, V., and E. Chasan. 2015. The 109,984-Word Annual Report. Available at: <https://blogs.wsj.com/cfo/2015/06/02/the-109894-word-annual-report/>
- Francis, J., S. Newman, and N. Newton. 2019. Does Tax Planning Affect Analysts' Forecast Accuracy? *Contemporary Accounting Research* 36(4): 2663-2694.
- Franco, G., O. Hope, D. Vyas, and Y. Zhou. 2015. Analyst Report Readability. *Contemporary Accounting Research* 32: 76-104.
- Frank, M., L. Lynch, and S. Rego. 2009. Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review* 84 (2): 467–496.
- Funk M. J., D. Westreich, C. Wiesen, T. Stürmer, M. A. Brookhart, and M. Davidian. 2011. Doubly Robust Estimation of Causal Effects. *American Journal of Epidemiology*. 173 (7):761-767
- Gleason, C. A., and L. F. Mills. 2011. Do auditor-provided tax services improve the estimate of tax reserves? *Contemporary Accounting Research* 28 (5): 1484-1509.
- Gow, I., G. Ormazabal, and D. Taylor. 2010. Correcting for Cross-Sectional and Time-Series Dependence in Accounting Research. *The Accounting Review* 85: 483-512.
- Gunning, R.1952. *The Technique of Clear Writing*. McGraw-Hill. P. 36–37.
- Gupta, S. and K., Newberry.1997. Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy*. 16(1):1-34.
- Hanlon, M., E. Maydew, and D. Saavedra. 2017. The Taxman Cometh: Does Tax Uncertainty Affect Corporate Cash Holdings? *Review of Accounting Studies*. 22 (3): 1198–1228.
- Harris, S. 2014. The Rise of Advisory Services in Audit Firms. https://pcaobus.org/news-events/speeches/speech-detail/the-rise-of-advisory-services-in-audit-firms_544
- Hogan, B., and T. Noga. 2015. Auditor-provided tax services and long-term tax avoidance. *Review of Accounting and Finance* 14 (3): 285-305.
- Hutchens, M. 2017. *Can Disclosure Characteristics Improve Analyst Forecast Accuracy?* Working paper, University of Illinois at Urbana-Champaign.
- Hux, C., J. Bedard, and T. Noga. 2023. Knowledge sharing in auditor-provided tax services: Experiences of audit and tax personnel. *Journal of the American Taxation Association*. 45 (1): 63–89.

- Inger, I., M. Meckfessel, M. Zhou, and W. Fan. 2018. An Examination of the Impact of Tax Avoidance on the Readability of Tax Footnotes. *The Journal of the American Taxation Association* 40 (1): 1-29.
- Kahneman, D., A. O. Sibony, and C. Sunstein. 2021. *NOISE A Flaw in Human Judgment*. Publisher Little Brown Spark New York Boston London. Chapter 6, 73-78.
- Kim, S., A. Schmidt, and K. Wentland. 2020. Analysts, Taxes, and the Information Environment. *Journal of the American Taxation Association* 42 (1): 103–131.
- Kim, C., K. Wang, and L. Zhang. 2019. Readability of 10-K Reports and Stock Price Crash Risk. *Contemporary Accounting Research* 36 (2), 1184-1216.
- Kinney, W. R., Z. V. Palmrose, and S. Scholz. 2004. Auditor independence, non-audit services, and restatements: Was the U.S. government right? *Journal of Accounting Research* 42 (3): 561-588.
- Kincaid, J., P. Fishburne, R. Rogers, and B. Chissom. 1975. Derivation of new readability formulas for Navy enlisted personnel. *Research Branch Report* 8–75.
- Klassen, K., P. Lisowsky, and D. Mescall. 2016. The Role of Auditors, Non-Auditors, and Internal Tax Departments in Corporate Tax Aggressiveness. *The Accounting Review* 91(1): 179-205.
- Kubick, T., D. Lynch, M. Mayberry, and T. Omer. 2016. The Effects of Regulatory Scrutiny on Tax Avoidance: An Examination of SEC Comment Letters. *The Accounting Review*. 91(6): 1751-1780.
- Lawrence, A. 2013. Individual investors and financial disclosure. *Journal of Accounting and Economics*. 56: 130-147.
- Lehavy, R., F. Li, and K. Merkley. 2011. The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review* 86 (3):1087-1115.
- Li, F. 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics* 45 (2–3): 221–247.
- Lo, K., F. Ramos, and R. Rogo. 2017. Earnings management and annual report readability. *Journal of Accounting & Economics* 63 (1):1–25. <https://doi.org/10.1016/j.jacceco.2016.09.002>
- Loughran, T., and B. McDonald. 2014. Measuring readability in financial disclosures. *The Journal of Finance* 69 (4): 1643–1671.
- Luo, L., S. Ma, T. Omer, and H. Xie. 2023. Tax Avoidance and Firm Value: Does Qualitative Disclosure in the Tax Footnote Matter? *Review of Accounting Studies*, forthcoming.
- Mayhew, B., and M. Wilkins. 2003. Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. *Auditing: A Journal of Practice & Theory* 22 (2):33–52.
- McGuire, S., T. Omer, and D. Wang. 2012. Tax avoidance: Does tax-specific industry expertise make a difference? *The Accounting Review* 87 (3): 975–1003.
- Miller, P. 2010. The effects of reporting complexity on small and large investor trading. *The Accounting Review* 85 (6): 2107–2143.
- Mills L. F., L. A. Robinson, and R. C. Sansing. 2010. FIN 48 and Tax Compliance. *The Accounting Review* 85: 1721–42.
- Mills, L. F., and R. C. Sansing. 2000. Strategic Tax and Financial Reporting Decisions: Theory and Evidence. *Contemporary Accounting Research* 17: 85–106.
- Morgan, S., and C. Winship. 2015. Counterfactuals and Causal Inference. Methods and Principles for Social Research. Second Edition. Cambridge University Press.

- Narduzzi S., M. Golini., D. Port., M. Stafoggia., and F. Forastiere. 2014. Inverse probability weighting (IPW) for evaluating and "correcting" selection bias. *Epidemiol Prev.* 38(5):335-41.
- Nesbitt, W., A. Persson, and J. Shaw.2020. *Auditor Tax Advisory Services and Clients' Tax Avoidance: Do Auditors Draw a Line in the Sand for Tax Advisory Services?* Working paper. Michigan State University, University of Illinois at Urbana-Champaign, and Central Michigan University.
- Olivo, N. 2020. Corporate tax disclosure could be a matter of how, not if. <https://www.law360.com/tax-authority/articles/1299971/corporate-tax-disclosure-could-be-a-matter-of-how-not-if>
- Public Company Accounting Oversight Board (PCAOB). 2012. The Sarbanes-Oxley Act Ten Years Later: Auditor Independence, Objectivity and Professional Skepticism https://pcaobus.org/News/Events/Documents/03282012_IAGMeeting/Independence_Objectivity_Working_Group_Report.pdf
- Rego. S. 2003 Tax avoidance activities of U.S. multinational corporations *Contemporary Accounting Research.* 20 (1):805-833
- Seetharaman, A., Y. Sun, and W. Wang. 2011. Tax-related financial statement restatements and auditor-provided tax services. *Journal of Accounting, Auditing & Finance* 26 (4): 677-698.
- Shane, P., and T. Stock. 2006. Security Analyst and Stock Market Efficiency in Anticipating Tax - Motivated Income Shifting. *The Accounting Review* 81(1): 227-250.
- Siegfried, J., 1974. Effective average U.S. corporation income tax rates. *National Tax Journal* 27: 245–259.
- Simunic, D. A. 1984. Auditing, consulting, and auditor independence. *Journal of Accounting Research* 22 (2): 679-702.
- Solomon, I, M. Shields, and O. Whittington.1999. What do industry-specialist auditors know? *Journal of accounting research.* 1(37).191-208.
- Stickney, C., and V. McGee. 1982. Effective corporate tax rates: The effect of size, capital intensity, leverage, and other factors. *Journal of Accounting and Public Policy* 1 (2): 125–152.
- Vansteelandt, S., J. Carpenter, and M. Kenward. 2010. Analysis of incomplete data using inverse probability weighting and doubly robust estimators. *Methodology.* 6: 37–48.
- Wilson, E., and D. Sherell. 1993. Source effects in communication and persuasion research: A meta-analysis of effect size. *Journal of the Academy of Marketing Science* 21 (2): 101–112.

Appendix A
Examples of Tax Footnote Disclosure

MONSANTO COMPANY (cik 1110783) Income tax footnote in 2012

<https://www.sec.gov/Archives/edgar/data/1110783/000119312512428583/d410012d10k.htm>

The components of income from continuing operations before income taxes were:

(Dollars in millions)	Year Ended Aug. 31,		
	2012	2011	2010
United States	\$1,954	\$1,640	\$1,230
Outside United States	1,034	734	260
Total	\$2,988	\$2,374	\$1,490

The components of income tax provision from continuing operations were:

(Dollars in millions)	Year Ended Aug. 31,		
	2012	2011	2010
Current:			
U.S. federal	\$ 301	\$ 330	\$ 258
U.S. state	49	43	5
Outside United States	310	271	122
Total Current	\$ 660	\$ 644	\$ 385
Deferred:			
U.S. federal	252	151	42
U.S. state	15	37	34
Outside United States	(26)	(115)	(82)
Total Deferred	241	73	(6)
Total	\$ 901	\$ 717	\$ 379

Factors causing Monsanto's income tax provision from continuing operations to differ from the U.S. federal statutory rate were:

Year Ended Aug. 31,

(Dollars in millions)		2012	2011	2010
U.S. Federal Statutory Rate	\$	1,046	\$ 831	\$ 522
U.S. R&D Tax Credit		(15)	(34)	(10)
U.S. Domestic Manufacturing Deduction		(67)	(37)	(22)
Lower Foreign Rates		(67)	(98)	(130)
State Income Taxes		42	52	33
Valuation Allowances		12	(7)	10
Adjustment for Unrecognized Tax Benefits		(59)	(1)	3
Other		9	11	(27)
Income Tax Provision	\$	901	\$ 717	\$ 379

Deferred income tax balances are related to:

As of Aug. 31,

(Dollars in millions)		2012	2011
Net Operating Loss and Other Carryforwards	\$	601	\$ 971
Employee Fringe Benefits		412	394
Restructuring and Impairment Reserves		148	154
Inventories		132	132
Royalties		106	80
Environmental and Litigation Reserves		73	87
Allowance for Doubtful Accounts		45	58
Intangibles		122	152
Other		225	236
Valuation Allowance		(50)	(44)
Total Deferred Tax Assets	\$	1,814	\$ 2,220
Property, Plant and Equipment	\$	546	\$ 527
Intangibles		407	454
Other		119	115
Total Deferred Tax Liabilities		1,072	1,096
Net Deferred Tax Assets	\$	742	\$ 1,124

As of Aug. 31 2012, Monsanto had available approximately \$1.2 billion in net operating loss carryforwards (NOLs), most of which related to Brazilian operations, which have an indefinite

carryforward period. Monsanto also had available approximately \$80 million of U.S. foreign tax credit carryforwards, which expire from 2018 through 2020. Management regularly assesses the likelihood that deferred tax assets will be recovered from future taxable income. To the extent management believes that it is more likely than not that a deferred tax asset will not be realized, a valuation allowance is established. As of Aug. 31 2012, management continues to believe it is more likely than not that the company will realize the deferred tax assets in Brazil and the United States.

Income taxes and remittance taxes have not been recorded on approximately \$3.1 billion of undistributed earnings of foreign operations of Monsanto, because Monsanto intends to reinvest those earnings indefinitely. It is not practicable to estimate the income tax liability that might be incurred if such earnings were remitted to the United States.

Tax authorities regularly examine the company's returns in the jurisdictions in which Monsanto does business. Due to the nature of the examinations, it may take several years before they are completed. Management regularly assesses the tax risk of the company's return filing positions for all open years. During fiscal year 2012, Monsanto recorded favorable adjustments to the income tax reserve as a result of the resolution of various domestic and foreign income tax matters. During fiscal year 2010, Monsanto recorded a favorable adjustment to the income tax reserve as a result of the conclusion of an IRS audit for tax years 2007 and 2008, foreign audits and the resolution of various state income tax matters.

As of Aug. 31, 2012, Monsanto had total unrecognized tax benefits of \$288 million, of which \$221 million would favorably impact the effective tax rate if recognized. As of Aug. 31, 2011, Monsanto had total unrecognized tax benefits of \$348 million, of which \$273 million would favorably impact the effective tax rate if recognized.

Accrued interest and penalties included in the Statements of Consolidated Financial Position were \$51 million and \$55 million as of Aug. 31, 2012, and Aug. 31, 2011, respectively. Monsanto recognizes accrued interest and penalties related to unrecognized tax benefits as a component of income tax expense. For the 12 months ended Aug. 31, 2012, the company recognized less than \$1 million of income tax expense for interest and penalties. For the 12 months ended Aug. 31, 2011, the company recognized an expense of \$8 million in the income tax provision for interest and penalties.

A reconciliation of the beginning and ending balance of unrecognized tax benefits is as follows:

(Dollars in millions)	2012	2011
Balance Sept. 1	\$ 348	\$ 341
Increases for prior year tax positions	24	18
Decreases for prior year tax positions	(71)	(8)
Increases for current year tax positions	11	13
Settlements	(3)	(1)
Lapse of statute of limitations	(13)	(22)
Foreign currency translation	(8)	7

Balance Aug. 31	\$ 288	348
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Monsanto operates in various countries throughout the world and, as a result, files income tax returns in numerous jurisdictions. These tax returns are subject to examination by various federal, state and local tax authorities. For Monsanto's major tax jurisdictions, the tax years that remain subject to examination are shown below:

Jurisdiction	Tax Years
U.S. federal income tax	2009—2012
U.S. state and local income taxes	2000—2012
Argentina	2001—2012
Brazil	2002—2012

If the company's assessment of unrecognized tax benefits is not representative of actual outcomes, the company's financial statements could be significantly impacted in the period of settlement or when the statute of limitations expires. Management estimates that it is reasonably possible that the total amount of unrecognized tax benefits could decrease by as much as \$150 million within the next 12 months, primarily as a result of the resolution of audits currently in progress in several jurisdictions involving issues common to large multinational corporations, and the lapsing of the statute of limitations in multiple jurisdictions.

KEWAUNEE SCIENTIFIC CORPORATION (cik: 55529) Income tax footnote in 2012

<https://www.sec.gov/Archives/edgar/data/55529/000119312512301987/d373472d10k.htm>

Income tax expense consisted of the following:

\$ in thousands	2012	2011	2010
Current tax expense (benefit):			
Federal	\$ 247	\$ 300	\$ 1,680
State and local	63	124	419
Foreign	838	185	226
Total current tax expense	<u>1,148</u>	<u>609</u>	<u>2,325</u>
Deferred tax expense (benefit):			
Federal	(338)	170	(611)
State and local	(12)	83	78
Foreign	(59)	2	129
Total deferred tax expense	<u>(409)</u>	<u>255</u>	<u>(404)</u>
Net income tax expense	<u>\$ 739</u>	<u>\$ 864</u>	<u>\$ 1,921</u>

The reasons for the differences between the above net income tax expense and the amounts computed by applying the statutory federal income tax rates to earnings before income taxes are as follows:

\$ in thousands	2012	2011	2010
Income tax expense at statutory rate	\$ 863	\$ 1,007	\$ 1,928
State and local taxes, net of federal income tax benefit (expense)	3	96	234
Tax credits (state, net of federal benefit)	(76)	(122)	(227)
Effects of differing US and foreign tax rates	(61)	(155)	48
Increase in valuation allowance	73	—	—
Other items, net	(63)	38	(62)
Net income tax expense	<u>\$ 739</u>	<u>\$ 864</u>	<u>\$ 1,921</u>

Significant items comprising deferred tax assets and liabilities as of April 30 were as follows:

\$ in thousands	2012	2011
Deferred tax assets:		
Accrued employee benefit expenses	\$ 480	\$ 366
Allowance for doubtful accounts	95	97
Deferred compensation	1,446	1,449
Tax credits	375	423
Unrecognized actuarial loss, defined benefit plans	4,146	3,075
Other	93	(25)
Total deferred tax assets	<u>6,635</u>	<u>5,385</u>
Deferred tax liabilities:		
Book basis in excess of tax basis of property, plant and equipment	(2,166)	(2,370)
Prepaid pension	(2,180)	(2,161)
Other	153	(24)
Total deferred tax liabilities	<u>(4,193)</u>	<u>(4,555)</u>
Less: valuation allowance	<u>(73)</u>	<u>—</u>
Net deferred tax assets (liabilities)	<u>\$ 2,369</u>	<u>\$ 830</u>
Deferred tax assets classified in the balance sheet:		
Current	\$ 713	\$ 431
Long-term	1,656	399
Net deferred tax assets (liabilities)	<u>\$ 2,369</u>	<u>\$ 830</u>

At April 30, 2012, the Company had federal tax credit carryforwards in the amount of \$63,000 expiring beginning in 2020 and state tax credit carryforwards in the amount of \$311,000, net of

federal benefit, expiring beginning in 2013. After a review of the expiration schedule of the tax credits and future taxable income required to utilize such credits before their expiration, a valuation allowance of \$73,000 was recorded at April 30, 2012.

GANNETT CO., INC. (cik: 39899) Income tax footnote in 2003

<https://www.sec.gov/Archives/edgar/data/39899/000095013304000855/w94831e10vk.htm>

The provision for income taxes consists of the following:

In thousands of dollars

2003	Current	Deferred	Total
Federal	\$ 458,871	\$ 42,390	\$501,261
State and other	70,990	5,860	76,850
Foreign	33,805	17,184	50,989
Total	\$ 563,666	\$ 65,434	\$629,100

In thousands of dollars

2002	Current	Deferred	Total
Federal	\$ 367,788	\$ 136,372	\$ 504,160
State and other	46,094	15,462	61,556
Foreign	15,374	23,310	38,684
Total	\$ 429,256	\$ 175,144	\$ 604,400

In thousands of dollars

2001	Current	Deferred	Total
Federal	\$ 241,713	\$ 200,065	\$ 441,778
State and other	34,437	28,504	62,941
Foreign	34,681	0	34,681
Total	\$ 310,831	\$ 228,569	\$ 539,400

GANNETT CO., INC. (cik: 39899) tax footnote in 2005

<https://www.sec.gov/Archives/edgar/data/39899/000119312506038810/d10k.htm>

The provision for income taxes on income from continuing operations consists of the following:

In thousands of dollars

2005	Current	Deferred	Total
Federal	\$ 466,688	\$ 6,313	\$ 473,001
State and other	71,930	873	72,803
Foreign	57,269	3,527	60,796
Total	\$595,887	\$10,713	\$606,600

In thousands of dollars

2004	Current	Deferred	Total
Federal	\$463,040	\$51,277	\$514,317
State and other	71,974	7,090	79,064
Foreign	51,206	20,213	71,419
Total	\$586,220	\$78,580	\$664,800

In thousands of dollars

2003	Current	Deferred	Total
Federal	\$447,224	\$42,533	\$489,757
State and other	69,374	5,880	75,254
Foreign	33,805	17,184	50,989

Total	\$550,403	\$65,597	\$616,000
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The components of earnings from continuing operations before income taxes consist of the following:

In thousands of dollars

	2005	2004	2003
Domestic	\$1,457,458	\$1,570,698	\$1,500,067
Foreign	360,397	389,485	305,690
Total	\$1,817,855	\$1,960,183	\$1,805,757

ENNIS, INC. (cik: 33002) Income tax footnote in 2007

<https://www.sec.gov/Archives/edgar/data/33002/000095013407010922/d46514e10vk.htm>

The Company maintains a valuation allowance to adjust the basis of net deferred tax assets in accordance with FAS 109 “Accounting for Income Taxes” for approximately \$250,000 as of February 28, 2007 and 2006 related to foreign tax credits. The Company has federal and state net operating loss carry forwards as a result of an acquisition in the amount of \$3,667,000 expiring in fiscal years 2016 through 2025.

ENNIS, INC. (cik: 33002) Income tax footnote in 2011

<https://www.sec.gov/Archives/edgar/data/33002/000095012311048069/d82151e10vk.htm>

The Company maintains a valuation allowance to adjust the basis of net deferred taxes in accordance with accounting standards for approximately \$250,000 as of February 28, 2011 and February 28, 2010, respectively, related to foreign tax credits. Included in other non-current deferred tax liability (asset) are currency exchange, stock options exercised, and the valuation allowance. The Company has federal and state net operating loss carry forwards as a result of an acquisition in the amount of \$1,477,000 expiring in fiscal years 2019 through 2025. Based on historical earnings, management believes it will be able to fully utilize the net operating loss carry forwards.

Appendix B
Variable Definitions

Main Variables	Definition
<i>FOG</i>	The Gunning-Fog index is (words per sentence in the tax footnote + percent of complex words in the tax footnote)×0.4
<i>FKGL</i>	The Flesch-Kincaid grade level, calculated as $0.39 \times (\text{total words} / \text{total sentences}) + 11.8 \times (\text{total syllables} / \text{total words}) - 15.59$.
<i>LENGTH</i>	The natural logarithm of the number of sentences in a tax footnote.
<i>APTS</i>	Following Christensen et al. (2015), <i>APTS</i> is an indicator variable that is 1 if a company's financial statements auditor provides more than \$61,000 in tax service; 0 otherwise. \$61,000 is the median auditor-provided tax services for the intersection of Compustat and Audit Analytics from 2004 to 2019.
<i>NONAPTS</i>	Following Christensen et al. (2015), <i>NONAPTS</i> is an indicator variable that is 1 if a company's financial statements auditor provides equaling or less than \$61,000 in tax service; 0 otherwise. \$61,000 is the median auditor-provided tax services for the intersection of Compustat and Audit Analytics from 2004 to 2019.
<i>TAXEXPERT</i>	An indicator variable that is 1 if an audit firm is a tax expert; 0 otherwise. Tax expertise is a tax service market share in a given MSA (city) and industry (two-digit SIC) market that is greater than or equal to 30 percent.
<i>TAXEXPERTAPTS</i>	An indicator variable that is 1 if the APTS provider is a tax-expert audit firm; 0 otherwise.
<i>NONTAXEXPERTAPTS</i>	An indicator variable that is 1 if the APTS provider is a nontax-expert audit firm; 0 otherwise.
<i>BIG4</i>	An indicator variable that is 1 if an audit firm is a Big4 auditor; 0 otherwise.
<i>BIG4APTS</i>	An indicator variable that is 1 if the APTS provider is a Big4 audit firm; 0 otherwise.
<i>NONBIG4APTS</i>	An indicator variable that is 1 if the APTS provider is a non-Big4 audit firm; 0 otherwise.
<i>Distracted_Office_APTS</i>	An indicator variable that is 1 if companies with APTS are from distracted offices.
<i>Undistracted_Office_APTS</i>	An indicator variable that is 1 if companies with APTS are from undistracted offices.
<i>Hard_to_Read</i>	An indicator variable that is 1 if tax footnotes with the top decile of <i>FOG</i> index.
<i>Noisy Industry</i>	An indicator variable that is 1 for industries with a top quartile (the highest 25%) standard deviation of <i>FOG</i> index within the industry-year; 0 otherwise.

<i>Noisy Industry_APTS</i>	An indicator variable that is 1 when firms that are from a noisy industry and have an APTS provider; 0 otherwise.
<i>Less Noisy Industry_APTS</i>	An indicator variable that is 1 when firms that are from a less noisy industry and have an APTS provider; 0 otherwise.
<i>AFE</i>	The absolute value of the difference between mean EPS one year ahead forecasted and EPS realized (as provided by IBES) scaled by the stock price at the time of issuance of the forecast (as provided by IBES).
<i>EASYTOREAD</i>	An indicator variable that is 1 when a firm's tax footnote readability is in the bottom quintile of the year-adjusted <i>FOG</i> ; 0 when a firm's tax footnote readability is in the top quintile of the year-adjusted <i>FOG</i> .
<i>GAAPETR</i>	Income taxes divided by pre-tax book income (TXT/PI).
<i>ROA</i>	Pre-tax book income (Compustat PI) divided by lagged total assets (Compustat AT).
<i>ACC</i>	Performance-matched pre-tax discretionary accruals following Frank et al. (2009)
<i>SIZE</i>	The natural logarithm of the market value of equity (Compustat PRCC_F*CSHO)
<i>FI</i>	Foreign income is pre-tax foreign income (Compustat PIFO) divided by lagged total assets (Compustat AT)
<i>EQINC</i>	An indicator that is 1 when the equity in earnings (Compustat ESUB) is positive, and zero otherwise
<i>INTAN</i>	Reported intangibles (Compustat INTAN) divided by lagged total assets (Compustat AT)
<i>PPE</i>	Net property, plant, and equipment (Compustat PPENT) divided by lagged total assets (Compustat AT)
<i>NOL</i>	An indicator variable equals one if the firm reports a positive tax loss carryforward during the year (Compustat TLCF), and zero otherwise
ΔNOL	Change in net operating loss carryforward (Compustat TLCF) divided by lagged assets (Compustat AT).
<i>MTB</i>	Lagged market-to-book ratio (Compustat PRCC_F \times CSHO)/CEQ)
<i>FCF</i>	Free cash flow, scaled by lagged assets ((Compustat OANCF-CAPX)/AT)
<i>LEV</i>	Leverage, computed as total long-term debt (Compustat DLTT) divided by lagged total assets (Compustat AT)
<i>XRD</i>	Research and development activity, computed by scaling R&D expense (Compustat XRD) by lagged total assets (Compustat AT).
<i>FOG10K</i>	The Gunning-Fog index for the entire 10-K filing
<i>FKGL10K</i>	The Flesch-Kincaid grade level for the entire 10-K filing

<i>LENGTH10K</i>	The natural logarithm of the number of sentences in the entire 10-K filing
<i>FOGFTNOTE</i>	The Gunning-Fog index for the entire footnote
<i>FKGLFTNOTE</i>	The Flesch-Kincaid grade level for the entire footnote
<i>LENGTHFTNOTE</i>	The natural logarithm of the number of sentences in the entire footnote
<i>TAXCONTENT1</i>	The value with the highest eigenvalue in the principal component analysis results of tax contents in a tax footnote
<i>TAXCONTENT2</i>	The value with the second-highest eigenvalue in the principal component analysis results of tax contents in a tax footnote

TABLE 1
Sample Composition

This table reports the sample selection procedures (Panel A) and industry distribution (Panel B) of the full sample.

Panel A: Sample Selection

Firm-year observations for US firms in Compustat in fiscal years 2004-2019	138,069
Less: Financial and utility firms	(27,504)
Less: Firms with assets less than \$1 million	(37,501)
Less: Firms with negative tax expense, taxes paid, and pre-tax book income	(40,236)
Less: Missing control variables and other data requirements described in the methodology section	(8,795)
Less: firm-year observations outside the merge with Audit Analytics data	(793)
Less: firm-year observations outside the merge with tax disclosure data	(1,175)
Less: firm-year observations without sufficient 10-K readability measures	(887)
Equals: Final sample	21,178

Panel B: Industry Distribution

Industry (one-digit SIC)	<i>APTS</i>		<i>NONAPTS</i>	
	Freq.	%.	Freq.	%.
0–1 (Agriculture, mining, oil, and construction)	509	2.40	759	3.58
2 (Food, tobacco, textiles, paper, and chemicals)	2,277	10.75	1,493	7.05
3 (Manufacturing, machinery, and electronics)	4,005	18.91	3,087	14.58
4 (Transportation and communications)	579	2.73	607	2.87
5 (Wholesale and retail)	1,750	8.26	1,467	6.93
7 (Services)	1,681	7.94	1,611	7.61
8–9 (Health, legal and educational services)	625	2.95	728	3.44

TABLE 2
Descriptive Statistics

This table reports descriptive statistics of variables used in regression models. We define all variables in Appendix B.

Variable	N	Mean	SD	Min	Median	Max
<i>GAAPETR</i>	21,178	0.304	0.125	0.239	0.328	0.376
<i>ROA</i>	21,178	0.126	0.098	0.060	0.101	0.162
<i>ACC</i>	21,178	0.011	0.101	-0.030	0.000	0.032
<i>SIZE</i>	21,178	6.733	2.094	5.433	6.822	8.095
<i>FI</i>	21,178	0.503	0.500	0.000	1.000	1.000
<i>EQINC</i>	21,178	0.173	0.378	0.000	0.000	0.000
<i>INTAN</i>	21,178	0.234	0.248	0.026	0.157	0.372
<i>PPE</i>	21,178	0.266	0.249	0.087	0.183	0.361
<i>NOL</i>	21,178	0.531	0.499	0.000	1.000	1.000
<i>ΔNOL</i>	21,178	-0.009	0.955	-0.002	0.000	0.000
<i>MTB</i>	21,178	3.562	3.910	1.571	2.433	3.947
<i>LEV</i>	21,178	0.185	0.201	0.001	0.135	0.293
<i>FCF</i>	21,178	0.072	0.097	0.026	0.070	0.119
<i>XRD</i>	21,178	0.029	0.051	0.000	0.000	0.036
<i>BIG4</i>	21,178	0.758	0.428	1.000	1.000	1.000
<i>TAXEXPERT</i>	21,178	0.204	0.403	0.000	0.000	0.000
<i>FOGFTNOTE</i>	21,178	21.970	1.360	21.200	22.000	22.800
<i>FOG10K</i>	21,178	20.096	1.706	19.024	19.607	20.497
<i>FKGLFTNOTE</i>	21,178	17.813	1.321	16.912	17.772	18.673
<i>FKGL10K</i>	21,178	18.773	1.983	17.682	18.406	19.281
<i>LENGTHFTNOTE</i>	21,178	5.918	0.474	5.645	5.958	6.238
<i>LENGTH10K</i>	21,178	7.253	0.659	7.039	7.327	7.602

TABLE 3
Univariate Results

This table reports univariate results on differences in tax disclosure between *APTS* and *NONAPTS* companies. We define all variables in Appendix B. ***, ** and * denote significance levels of 1%, 5%, and 10%, respectively.

Variable	<i>APTS</i>			<i>NONAPTS</i>			Difference
	N	Mean	SD	N	Mean	SD	
<i>FOG</i>	11,426	26.763	6.725	9,752	28.279	8.807	-1.516***
<i>FKGL</i>	11,426	22.551	6.554	9,752	23.858	8.592	-1.307***
<i>LENGTH</i>	11,426	3.012	0.731	9,752	2.683	0.807	0.329***

Table 4
Correlations

This table reports the Pearson correlation coefficients between variables of interest. We define all the variables in Appendix B. Values in bold are significant at least at $p < 0.10$. Due to space limitations, we only report dependent, independent variables and the main analysis's most relevant control variables.

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>
<i>1</i> APTS														
<i>2</i> TAXEXPERT	0.325													
<i>3</i> BIG4	0.370	0.284												
<i>4</i> FOG	-0.097	-0.016	-0.078											
<i>5</i> FKGL	-0.102	-0.017	-0.074	0.985										
<i>7</i> LENGTH	0.209	0.048	0.236	-0.695	-0.706	-0.697								
<i>8</i> GAAPETR	-0.004	-0.030	0.057	0.125	0.139	0.123	-0.125							
<i>9</i> ROA	-0.059	-0.006	-0.083	0.061	0.055	0.063	-0.156	0.003						
<i>10</i> ACC	-0.160	-0.093	-0.272	0.017	0.016	0.011	-0.116	-0.100	0.085					
<i>11</i> SIZE	0.423	0.213	0.572	-0.192	-0.205	-0.174	0.391	-0.017	0.046	-0.315				
<i>12</i> FI	0.301	0.136	0.263	-0.197	-0.208	-0.176	0.394	-0.112	-0.073	-0.135	0.395			
<i>13</i> EQINC	0.109	0.049	0.146	-0.037	-0.038	-0.034	0.111	-0.020	-0.060	-0.021	0.229	0.109		
<i>14</i> PPE	-0.058	-0.014	0.028	0.058	0.057	0.055	-0.123	0.017	0.018	-0.010	0.052	-0.194	0.105	
<i>15</i> NOL	0.101	0.016	0.095	-0.214	-0.213	-0.213	0.351	-0.091	-0.160	-0.036	0.138	0.208	0.041	-0.086

TABLE 5
APTS and Tax Disclosure: Ordinary Least Squares

This table reports OLS regressions of the effect of APTS on tax disclosure. Dependent variables are *FOG*, *FKGL*, and *LENGTH*. The independent variable is *APTS*. We define all variables in Appendix B. For brevity, we do not tabulate the intercept and year and industry fixed effects. We report two-tailed *p*-values, and we cluster standard errors by firm.

Variable	<i>FOG</i>		<i>FKGL</i>		<i>LENGTH</i>	
	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value	Estimate	<i>p</i> -value
<i>APTS</i>	-0.361	(0.044)	-0.328	(0.061)	0.016	(0.262)
<i>GAAPETR</i>	3.763	(0.000)	3.666	(0.000)	-0.056	(0.209)
<i>ROA</i>	3.256	(0.001)	3.345	(0.001)	-0.389	(0.000)
<i>ACC</i>	-2.218	(0.004)	-2.165	(0.004)	0.003	(0.959)
<i>SIZE</i>	-0.382	(0.000)	-0.339	(0.000)	0.026	(0.000)
<i>FI</i>	-1.273	(0.000)	-1.042	(0.000)	0.241	(0.000)
<i>EQINC</i>	-0.111	(0.584)	-0.092	(0.643)	0.027	(0.156)
<i>INTAN</i>	0.855	(0.034)	0.768	(0.053)	-0.153	(0.000)
<i>PPE</i>	0.463	(0.424)	0.469	(0.409)	-0.128	(0.005)
<i>NOL</i>	-1.767	(0.000)	-1.747	(0.000)	0.216	(0.000)
<i>ΔNOL</i>	0.009	(0.624)	0.013	(0.479)	-0.002	(0.508)
<i>MTB</i>	-0.025	(0.112)	-0.027	(0.067)	0.002	(0.139)
<i>LEV</i>	-0.332	(0.517)	-0.351	(0.485)	0.031	(0.466)
<i>FCF</i>	-0.356	(0.727)	-0.391	(0.695)	0.046	(0.557)
<i>XRD</i>	-9.594	(0.000)	-9.480	(0.000)	1.009	(0.000)
<i>TAXCONTENT1</i>	-0.325	(0.000)	-0.315	(0.000)	0.023	(0.000)
<i>TAXCONTENT2</i>	-0.138	(0.008)	-0.131	(0.009)	0.013	(0.007)
<i>BIG4</i>	-0.441	(0.138)	-0.535	(0.068)	0.114	(0.000)
<i>FOGFTNOTE</i>	0.689	(0.000)				
<i>FOG10K</i>	0.069	(0.237)				
<i>FKGLFTNOTE</i>			0.668	(0.000)		
<i>FKGL10K</i>			0.024	(0.413)		
<i>LENGTHFTNOTE</i>					0.422	(0.000)
<i>LENGTH10K</i>					0.023	(0.006)
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
N	21,178		21,178		21,178	
R-squared	0.221		0.214		0.536	

TABLE 6
APTS and Tax Disclosure: IPWRA

This table reports the IPWRA results of the effect of APTS on tax disclosures. Panel A provides covariate balance results between the treatment group (*APTS*) and the control group (*NONAPTS*). Panel B reports the average treatment effect (ATE) and the average treatment effect on the treated (ATET) between firms with APTS and firms without APTS. We define all variables in Appendix B. ***, ** and * denote two-sided significance levels of 1%, 5%, and 10%, respectively.

Panel A: Covariate Balance Between the Treatment and the Control Groups

<i>APTS</i>		<i>NONAPTS</i>		χ^2	<i>p</i> -value
N	WEIGHTED	N	WEIGHTED		
11,426	10,854.7	9,752	10,323.3	20.469	0.554

Panel B: APTS and Tax Disclosure

<i>FOG</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>APTS vs NONAPTS</i>	-0.403	0.114	-3.53***	-0.424	0.104	-4.07***
<i>FKGL</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>APTS vs NONAPTS</i>	-0.368	0.112	-3.28***	-0.377	0.103	-3.68***
<i>LENGTH</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>APTS vs NONAPTS</i>	0.026	0.009	2.75***	0.029	0.010	2.94***

TABLE 7
APTS, Tax Expertise, and Tax Disclosure: IPWRA

This table reports IPWRA results from testing subsamples by industry tax expertise. ATE and ATET are the average treatment effect and the average treatment effect on the treated between firms with APTS provided by a (non) tax expert (*(NON)TAXEXPERTAPTS*) and firms without APTS (*NONAPTS*). Observations in the *NONTAXEXPERTAPTS* group, *TAXEXPERTAPTS* group, and *NONAPTS* group are 7,974, 3,452, and 9,752, respectively. We define all variables in Appendix B. ***, **, and * denote one-sided significance levels of 1%, 5%, and 10%, respectively.

<i>FOG</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONTAXEXPERTAPTS vs NONAPTS</i>	-0.345	0.121	-2.84***	-0.247	0.104	-2.39***
<i>TAXEXPERTAPTS vs NONAPTS</i>	-0.893	0.615	-1.45*	-1.298	0.160	-8.15***
<i>TAXEXPERTAPTS vs NONTAXEXPERTAPTS</i>	-0.689	0.172	-4.01***	-0.304	0.137	-2.22**
<i>FKGL</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONTAXEXPERTAPTS vs NONAPTS</i>	-0.287	0.120	-2.40***	-0.168	0.101	-1.67**
<i>TAXEXPERTAPTS vs NONAPTS</i>	-0.967	0.186	-5.20***	-1.087	0.119	-9.11***
<i>TAXEXPERTAPTS vs NONTAXEXPERTAPTS</i>	-0.656	0.158	-4.16***	-0.485	0.137	-3.55***
<i>LENGTH</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONTAXEXPERTAPTS vs NONAPTS</i>	0.025	0.010	2.52***	0.020	0.010	2.10**
<i>TAXEXPERTAPTS vs NONAPTS</i>	0.093	0.016	5.90***	0.082	0.013	6.51***
<i>TAXEXPERTAPTS vs NONTAXEXPERTAPTS</i>	0.050	0.013	3.85***	0.035	0.012	2.99***

TABLE 8
APTS, Big4 Auditor, and Tax Disclosure: IPWRA

This table reports IPWRA results from testing subsamples based on whether a Big4 auditor audits the firm. ATE and ATET are the average treatment effect and the average treatment effect on the treated between firms with APTS provided by a (non) Big4 ((*NON*) *BIG4APTS*) and firms without APTS (*NONAPTS*). Observations in the *NONBIG4APTS* group, *BIG4APTS* group, and *NONAPTS* group are 1,094, 10,332, and 9,752, respectively. We define all variables in Appendix B. ***, **, and * denote one-sided significance levels of 1%, 5%, and 10%, respectively.

<i>FOG</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONBIG4APTS</i> vs <i>NONAPTS</i>	0.353	0.352	1.00	0.339	0.288	1.18
<i>BIG4APTS</i> vs <i>NONAPTS</i>	-0.478	0.124	-3.86***	-0.486	0.222	-2.18**
<i>BIG4APTS</i> vs <i>NONBIG4APTS</i>	-1.161	0.475	-2.45**	-1.061	0.528	-2.01**
<i>FKGL</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONBIG4APTS</i> vs <i>NONAPTS</i>	0.406	0.330	1.23	0.345	0.282	1.22
<i>BIG4APTS</i> vs <i>NONAPTS</i>	-0.455	0.123	-3.69***	-0.510	0.226	-2.26**
<i>BIG4APTS</i> vs <i>NONBIG4APTS</i>	-1.075	0.454	-2.37***	-0.968	0.500	-1.93**
<i>LENGTH</i>						
	ATE	Std. E	<i>z</i>	ATET	Std. E	<i>z</i>
<i>NONBIG4APTS</i> vs <i>NONAPTS</i>	-0.015	0.026	-0.57	-0.023	0.020	-1.15
<i>BIG4APTS</i> vs <i>NONAPTS</i>	0.067	0.011	6.27***	0.090	0.021	4.30***
<i>BIG4APTS</i> vs <i>NONBIG4APTS</i>	0.062	0.048	1.29*	0.038	0.052	0.74

TABLE 9
APTS and Tax Disclosure: Difference-in-Differences

This table reports difference-in-differences regressions of the effect of an APTS decrease, due to the 2005 KPMG deferred prosecution agreement, on readability based on whether clients terminated purchasing APTS from KPMG. The dependent variable is *LESSREADABLE*, which equals one if a tax footnote became less readable (i.e., Fog index increased from year t to year $t+1$) and zero otherwise. *Terminating APTS* is for firms that were KPMG's clients in 2004 but completely dropped APTS in 2006. We do not tabulate the intercept and fixed effects for brevity, and p -values are one-sided for directional predictions. All variables are defined in Appendix B.

<i>LESSREADABLE</i>				
Variable	<i>Terminating APTS</i>		<i>Non-Terminating APTS</i>	
	Estimate	p-value	Estimate	p-value
<i>KPMGAPTS</i> × <i>POST</i>	0.459	(0.002)	-0.025	(0.494)
<i>KPMGAPTS</i>	-0.157	(0.030)	0.019	(0.489)
<i>POST</i>	0.007	(0.896)	0.085	(0.000)
<i>ETR</i>	0.095	(0.611)	-0.149	(0.005)
<i>ROA</i>	0.038	(0.899)	-0.211	(0.006)
<i>ACC</i>	0.676	(0.065)	0.181	(0.067)
<i>SIZE</i>	0.035	(0.041)	-0.006	(0.103)
<i>FI</i>	0.034	(0.486)	-0.019	(0.109)
<i>EQINC</i>	0.087	(0.185)	0.016	(0.277)
<i>INTAN</i>	-0.098	(0.247)	-0.022	(0.444)
<i>PPE</i>	-0.051	(0.458)	-0.048	(0.083)
<i>NOL</i>	0.056	(0.196)	0.037	(0.001)
Δ <i>NOL</i>	0.122	(0.834)	0.017	(0.633)
<i>MTB</i>	-0.036	(0.016)	0.004	(0.029)
<i>LEV</i>	-0.018	(0.886)	0.037	(0.288)
<i>FCF</i>	0.004	(0.992)	0.098	(0.259)
<i>XRD</i>	0.000	(0.523)	0.000	(0.725)
<i>FOGFTNOTE</i>	0.012	(0.475)	0.001	(0.910)
<i>FOG10K</i>	-0.035	(0.018)	0.000	(0.943)
<i>TAXCONTENT1</i>	-0.007	(0.900)	0.037	(0.163)
<i>TAXCONTENT2</i>	-0.002	(0.006)	-0.003	(0.000)
Observations	519		7,737	
Pseudo R ²	0.043		0.024	

TABLE 10
APTS and Tax Disclosure: Changes Specification

This table reports changes (first-differences) regressions of the association between APTS increases and future changes in tax disclosure. We define all variables in Appendix B. We do not tabulate the fixed effects for brevity, and p -values are two-sided.

Variable	ΔFOG		$\Delta FKGL$		$\Delta LENGTH$	
	Estimate	p -value	Estimate	p -value	Estimate	p -value
<i>APTSINCREASE</i>	-0.303	(0.046)	-0.281	(0.029)	0.020	(0.020)
<i>ΔETR</i>	-0.551	(0.468)	0.000	(1.000)	0.003	(0.939)
<i>ΔROA</i>	2.455	(0.101)	0.145	(0.910)	-0.008	(0.920)
<i>ΔACC</i>	-1.201	(0.165)	-0.844	(0.252)	0.076	(0.112)
<i>ΔSIZE</i>	0.592	(0.008)	0.109	(0.565)	-0.016	(0.206)
<i>ΔFI</i>	0.092	(0.749)	0.077	(0.755)	-0.008	(0.609)
<i>ΔEQINC</i>	-0.478	(0.155)	-0.495	(0.084)	0.037	(0.049)
<i>ΔINTAN</i>	0.024	(0.977)	0.027	(0.969)	0.012	(0.787)
<i>ΔPPE</i>	1.760	(0.240)	1.766	(0.166)	-0.055	(0.496)
<i>ΔNOL</i>	-0.711	(0.012)	0.127	(0.598)	-0.002	(0.886)
<i>ΔNOLC</i>	0.788	(0.521)	0.698	(0.504)	-0.102	(0.125)
<i>ΔMTB</i>	-0.026	(0.623)	-0.066	(0.142)	-0.002	(0.557)
<i>ΔLEV</i>	-0.145	(0.873)	0.092	(0.905)	-0.041	(0.401)
<i>ΔFCF</i>	-1.784	(0.121)	-1.391	(0.156)	0.179	(0.005)
<i>ΔXRD</i>	-12.822	(0.185)	-6.962	(0.398)	-0.035	(0.948)
<i>ΔTAXCONTENT1</i>	0.039	(0.599)	-0.080	(0.209)	0.010	(0.025)
<i>ΔTAXCONTENT2</i>	-0.111	(0.176)	0.014	(0.838)	-0.001	(0.780)
<i>ΔFOGFOOT10K</i>	0.297	(0.011)				
<i>ΔFOG10K</i>	0.102	(0.111)				
<i>FOG_LAG</i>	-0.321	(0.000)				
<i>ΔFKGLFOOT10K</i>			0.015	(0.812)		
<i>ΔFKGL10K</i>			0.024	(0.042)		
<i>FKGL_LAG</i>			0.110	(0.000)		
<i>ΔLENGTHFOOT10K</i>					0.035	(0.213)
<i>ΔLENGTH10K</i>					-0.017	(0.003)
<i>LENGTH_LAG</i>					0.210	(0.000)
Constant	5.295	(0.099)	-5.126	(0.061)	-0.291	(0.060)
Observations	10,188		10,188		10,188	
R-squared	0.148		0.044		0.161	

TABLE 11
The Moderating Role of Distraction

This table reports IPWRA results for the role of distraction in the association between APTS and tax disclosure. ATE and ATET are the average treatment effect and the average treatment effect on the treated between firms with APTS provided by a distracted auditing office (*Distracted_Office_APTS*), undistracted audit office (*Undistracted_Office_APTS*), and firms without APTS (*NONAPTS*). Observations in the *Distracted_Office*, *Undistracted_Office*, *Distracted_Office_APTS*, and *Undistracted_Office_APTS*, are 8,557, 12,621, 981, and 1,136, respectively. We define all variables in Appendix B. ***, **, and * denote one-sided significance levels of 1%, 5%, and 10%, respectively.

	<i>Hard to Read</i>					
	ATE	Std. E	z	ATET	Std. E	z
<i>Distracted_Office_APTS</i> vs <i>Undistracted_Office_APTS</i>	0.040	0.012	3.27***	0.047	0.014	3.25***
<i>Distracted_Office_APTS</i> vs <i>NONAPTS</i>	0.016	0.009	1.74*	0.016	0.008	1.98**
<i>Undistracted_Office_APTS</i> vs <i>NONAPTS</i>	-0.020	0.010	-2.12**	-0.016	0.007	-2.23**
<i>Distracted_Office</i> vs <i>Undistracted_Office</i>	0.018	0.004	4.50***	0.021	0.004	4.70***

TABLE 12
The Moderating Role of Industry Noise in Tax Disclosure

This table reports IPWRA results for the moderating role of the industry noise of tax disclosures in the association between APTS and tax disclosure. ATE and ATET are the average treatment effect and the average treatment effect on the treated between firms with APTS and from industries with greater variation in tax disclosure (*Noisy Industry_APTS*), firms with APTS and from industries with less variation in tax disclosure (*Less_Noisy Industry_APTS*), and firms without APTS (*NONAPTS*). Observations in the *Noisy Industry_APTS*, *Less_Noisy Industry_APTS*, and *NONAPTS* groups are 2,826, 8,600, and 9,752, respectively. We define all variables in Appendix B. ***, **, and * denote one-sided significance levels of 1%, 5%, and 10%, respectively.

FOG						
	ATE	Std. E	z	ATET	Std. E	z
<i>Noisy Industry_APTS vs Less Noisy Industry_APTS</i>	0.781	0.364	2.14 **	3.013	0.260	11.58***
<i>Noisy Industry_APTS vs NONAPTS</i>	-0.148	0.513	-0.29	-0.812	0.470	-1.73**
<i>Less Noisy Industry_APTS vs NONAPTS</i>	-1.389	0.126	-11.03***	-0.849	0.078	-10.85***
FKGL						
	ATE	Std. E	z	ATET	Std. E	z
<i>Noisy Industry_APTS vs Less Noisy Industry_APTS</i>	0.807	0.414	1.95 **	3.287	0.244	13.46 ***
<i>Noisy Industry_APTS vs NONAPTS</i>	-0.563	0.461	-1.22	-0.910	0.534	-1.70**
<i>Less Noisy Industry_APTS vs NONAPTS</i>	-1.509	0.125	-12.05***	-0.867	0.078	-11.06***
LENGTH						
	ATE	Std. E	z	ATET	Std. E	z
<i>Noisy Industry_APTS vs Less Noisy Industry_APTS</i>	-0.034	0.039	-2.14 **	-0.293	0.022	-13.17***
<i>Noisy Industry_APTS vs NONAPTS</i>	0.036	0.040	0.91	0.146	0.054	2.27***
<i>Less Noisy Industry_APTS vs NONAPTS</i>	1.105	0.011	9.33***	0.078	0.009	8.35***