Auditor-provided Tax Services and Clients' Tax Avoidance:

Do Auditors Draw a Line in the Sand for Tax Advisory Services?

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Abstract

In this study, we empirically examine the upper bound of the relationship between auditor-provided tax services (APTS) and clients' level of tax avoidance. This question is of significant interests for regulators because recent incidents of audit firms' involvement in clients' tax aggressive activities have reignited concerns about the extent to which non-audit services could impair auditor independence and audit quality. Using quadratic and linear-log regressions, we document a negative association between tax fees paid and clients' effective tax rates, but the association diminishes as clients become more tax aggressive. Interestingly, using quartile regressions, we find evidence that for the most tax aggressive firms (firms in the lowest quartile of ETR), the association between APTS and ETR turns positive. This positive association is consistent with audit firms reducing their level of tax service engagement when clients become more tax aggressive, possibly due to regulatory, reputational, or litigation concerns. These results are consistent with audit firms adhering to PCAOB's Rule 3522, which prohibits the provision of tax aggressive services to public clients. In cross-sectional analyses, we find some evidence that large clients influence audit firms to be more tax aggressive, consistent with economic bonding between these parties. These results should be informative to policymakers and regulators in their review of non-audit services.

Keywords: Auditor-provided tax services, Tax avoidance, Effective tax rate, PCAOB regulation, Non-audit services

JEL Classification: H25, G30

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1. Introduction

There is a renewed concern among regulators regarding the extent to which auditors provide non-audit services to their clients and how such activities could impair their independence and audit quality. In 2014, the European Union (E.U.) introduced a new audit directive which severely limits both the amount and types of non-audit services a firm can provide to its audit clients (European Council Directive 2014/56/EU). This directive prohibits the provision of tax advisory and compliance services, among others. [1] In the United Kingdom, the Financial Reporting Council, the regulatory body for the audit industry, has urged an inquiry into whether accounting firms should be restricted to audit-only functions (Marriage 2018). In the United States, the Public Company Accounting Oversight Board (PCAOB) also expressed concern about audit firms' role in the aggressive tax behavior of some clients (Harris 2014).[2] In addition, recent news has highlighted the resurgence of consultancy as a major stream of revenue for audit firms and concerns "about potential for conflicts of interest and loss of focus on auditing" (Rapoport 2018).

However, eextant academic research primarily document spillover benefits of non-audit services (NAS), including tax services (e.g., Abernathy, Rapley and Stekelberg 2016; Gleason

[1] Prohibited non-audit services include tax advisory and compliance services, involvement in management decision-making, advisory services related to capital or debt financing and structuring, and certain legal services. In addition, non-audit services are capped at 70% of audit fees. E.U. Member states can make exceptions to the list of prohibited services, only if the non-audit service in question has no direct effect or has an immaterial effect on the audited financial statements. These restrictions substantially limit the scope of non-audit services.

[2] The PCAOB launched a review into the "nature of the tax services that auditors are performing for their audit clients" following accusations PwC provided tax strategies that allowed Caterpillar to avoid $2.4 Billion in taxes. The PCAOB has declined to discuss the status of the review other than it is ongoing. Federal agents from the Commerce Department and the IRS have been investigating Caterpillar and PwC with regard to this tax structure (U.S. Audit Regulator Scrutinizing PwC over Caterpillar Tax Advice, WSJ 11/18/2014; Caterpillar Fights to Protect Its Swiss-Made Profits WSJ 01/01/2018).

and Mills 2011; Kinney, Palmrose and Scholz 2004). Practitioners also argue that restricting firms to audit-only functions would harm the industry (Dancey 2018). They highlight that audits are becoming increasingly more complex and argue auditors need the knowledge and experience from non-audit consultancy to develop the expertise to challenge and probe management. Given the calls for new regulation limiting APTS which would potentially diminish the knowledge spillover benefits that have been documented in the prior literature, there needs to be a review of whether, on average, audit firms comply with existing regulations.

In 2006, the PCAOB instituted Rule 3522, which prohibits audit firms from providing "tax aggressive" services to their publicly-listed clients. This rule creates an upper boundary on the scope of tax planning strategies a firm can provide. However, there is not a bright-line definition of tax aggressiveness. Rule 3522 defines an non-aggressive tax position as one that "is at *least more likely than not* to be allowable under applicable tax laws". This requires considerable judgment on the part of the auditor and client as to whether a particular tax strategy is aggressive. In this study, we empirically test for the evidence of the upper boundary by examining the association between the tax services procured from the auditor and clients' level of tax avoidance.

Tax avoidance can be viewed as a continuum which starts with the benign tax strategies (e.g., investment in tax-free bonds) at one end and ends with the aggressive tax strategies (e.g., tax shelters) at the other end (Hanlon and Heitzman 2010). Pecking order theory suggests that tax advisors will first assist their clients with benign strategies to reduce their taxes (i.e., the "low-hanging fruits"). After these strategies have been exhausted, tax advisors will have to develop incrementally more aggressive, costly, and complex tax strategies to achieve higher levels of tax avoidance for their clients. If the auditors provide their clients with these tax planning services,

then we argue that there should be a point where the incremental tax planning become too aggressive that, in order to maintain compliance with PCAOB regulations, the auditors are unable to supply such service.

Johnstone (2000) develops a model for an audit firm's decision to accept a client. The author tests the model using an experimental setting and finds that auditors choose to avoid risky clients rather than adapt to less "acceptable" clients via higher audit fees and/or increases in audit effort. In this study, we conjecture that tax partners follow a similar client-engagement acceptance process and prefer to forego risky tax engagements.

Our findings support this hypothesis. Using both quadratic and linear-log regression models, we document evidence of a negative and declining association between fees paid for auditor tax services and clients' effective tax rates (GAAP and cash ETRs). We interpret the non-linear results as evidence of diminishing returns. Next, we utilize both quantile and quartile regressions to identify the point where the negative association between APTS and ETR ceases to hold. First, we run univariate quantile regressions to identify the point at which the negative association ceases to be statistically significant. The quantile regression shows the negative association between APTS and GAAPETR reverts around the 24th percentile of GAAPETR (this translates to a GAAPETR of 16.23%). Interestingly, we observe that the relation turns positive and statistically significant at the 23rd percentile and below. We interpret the positive association as audit firms, not only foregoing additional tax services, but reducing their level of existing engagement as clients become more tax aggressive possibly due to regulatory, reputational, or litigation concerns.

Next, we partition the sample into quartiles and run the quadratic and linear-log models within each sub-sample. Consistent with our main results, we find evidence of a negative but

diminishing association between auditor tax services and clients' effective tax rates for the middle quartiles. However, we find evidence of a positive association between auditor tax services and clients' effective tax rates for the least tax aggressive clients (i.e., those in the top quartile) as well as the most tax aggressive clients (i.e., those in the bottom quartile), consistent with the results from our univariate analysis. In particular, the positive association for the most tax aggressive clients suggests that audit firms are not the source of aggressive tax strategies for these clients (Klassen et al. 2016).[3]

Finally, we conduct a number of cross-sectional analyses to identify the particular areas of concern regarding non-audit tax services. First, we examine whether there has been a deterioration in the effectiveness of PCAOB regulations over time. In recent years, anecdotal events suggest audit firms are increasingly implicated in clients' tax aggressive activities. Results from a trend analysis suggest audit firms are being more aggressive in the tax strategies provided to their audit clients. However, the increases occur primarily in two fiscal years: 2009 and 2016. Therefore, such results should be interpreted with caution.

Second, we examine whether the degree of compliance with PCAOB regulations varies with the absolute size of the client or relative importance of tax fees to the total revenue earned from the client. We fail to find evidence that the audit firms with a higher ratio of tax fees to total fees are more inclined to provide aggressive tax strategies to their clients. However, we do find that larger clients exhibit a statistically larger association between APTS and clients' level of tax avoidance. There are two potential interpretations for the latter finding. On the one hand, the stronger association could indicate a willingness to "push the envelope" when it comes to the

[3] The benefits from investing in tax planning may not materialize contemporaneously. In additional analyses, we use three-year measures (*t* thru *t+2*) of tax avoidance to re-test our hypothesis. We find qualitatively similar results using the long-run measures of tax avoidance.

aggressiveness of the tax strategies they offer to their larger clients. On the other hand, larger clients could have more tax planning opportunities that facilitate more sophisticated tax strategies. Given concerns about possible economic bonding, the size of a client relative to the audit office is a possible area of focus for the PCAOB review. [4]

This paper makes several important contributions. First, the paper provides large-sample empirical evidence consistent with audit firms adhering to current PCAOB regulations on the non-provision of aggressive tax strategies. When anecdotal events like the Caterpillar case occur, regulators, investors, and other stakeholders often wonder if there is a more systemic problem in the industry. The findings of this paper are informative to the policy debate on striking the 'right' regulatory balance for non-audit services. Non-audit services create knowledge spillover for audit firms that can provide key insights into the client's operations and enable auditors to higher audit quality, improve client performance, and provide relevant financial information to users (e.g., Abernathy et al. 2016; Gleason and Mills 2011; Kinney et al. 2004; De Simone et al. 2015). Therefore, over- or under-regulation can have unintended consequences both for audit quality and client financial performance.

Second, we provide empirical evidence on the extent to which U.S. audit firms comply with the current PCAOB regulations that prohibit auditors from providing aggressive tax strategies to their publicly-listed clients.[5] Reputational and litigation risk has been an area of focus for audit firms in the era of PCAOB regulations. Audit firms have enhanced their risk management and client engagement and acceptance procedures to lower audit firm risk and

[4] In additional analysis, we find no evidence of a differential effect for Big Four versus non-Big Four audit firms, suggesting that both large and small audit firms exercise the same level of adherence to the PCOAB regulations (untabulated).

[5] PCAOB regulations only apply to accounting firms auditing SEC registrants. Throughout the paper we use the term 'audit firm' or to refer to the public accounting entities subject to PCAOB regulations and 'clients' to refer to the publicly-listed companies that use the services of the audit firm.

tailored their offerings to ensure compliance with PCAOB regulations (Abernathy, Barnes and Stefaniak 2013; Klassen, Lisowsky, and Mescall 2016). Whereas prior studies primarily focused on how companies adjusted their demand for auditor's services (audit and non-audit) post-SOX and post-PCAOB (e.g., Omer, Bedard and Falsetta 2006; Omer and Smith 2010; Maydew and Shackelford 2007), there has not been any empirical evidence on how the PCAOB regulations affect the supply-side of non-audit services. To the best of our knowledge, this is the first study to examine the supply-side response to the regulations on auditor-provided tax services.

Finally, the paper provides evidence that the association between auditor tax services and clients' tax avoidance is non-linear and depends on the client's level of tax avoidance. Prior studies assume this relation as one-directional throughout the tax avoidance continuum (i.e., more APTS is associated with higher tax avoidance). This assumption can result in incorrect inferences. We document that the direction of the association flips for clients with high (low) effective tax rates. Our results suggest that auditors are unlikely the source for the more aggressive tax strategies. A contemporaneous study by Beardsley, Imdieke, and Omer (2018), also documents a non-linear association between total non-audit services and audit quality. They find evidence of higher client misstatements, more missed material weaknesses, and greater earnings management for both high and low levels of non-audit services. Their study suggests that only a moderate level of non-audit services improves audit quality. Our study and Beardsley et al. (2018) highlight the importance for academic researchers to consider the potential for significant changes in the association between APTS and client characteristics (e.g., tax avoidance and audit quality). Further research in this area should take into account the possibility of such non-linear relations into hypothesis development, research design choices, and interpretation of results.

The remainder of the paper proceeds as follows: section 2 discusses PCAOB regulation of non-audit services and related literature; section 3 provides hypothesis development; section 4 describes the sample selection and research design; section 5 presents the empirical results, and section 6 concludes.

2. Background and Prior Literature

2.1 PCAOB Regulations of Audit Industry

Independence is arguably the most important principle of the audit profession. Ray Ball (2001) asserts that independently audited financial statements are essential for an economically efficient market. Further, the independence of the external auditor is essential to ensure that managers are limited in their ability to manipulate earnings (Ball 2001). The American Institute of Certified Public Accountants (AICPA) Code of Conduct requires auditors to be independent in mind and appearance. To be compliant with the AICPA code, auditors must execute their attestation services "without being affected by influences that compromise professional judgement," and must avoid circumstances that would cause a reasonable and informed third party to believe that the integrity, objectivity, or professional skepticism of the auditor has been impaired (AICPA Code of Professional Conduct 2016).

The Securities and Exchange Commission (SEC) has long been concerned with the risk of impairment of auditor independence stemming from auditors providing non-audit services (NAS) to their clients. This concern stems from the belief that firms who provide NAS to their clients have the potential to become financially dependent on the fees generated from these NAS, forming an economic bond between the auditor and client (Beck, Frecka and Solomon 1988). This bond could impair the auditor's judgment and lead the auditor to overlook audit deficiencies in order to preserve the auditor/client relationship.

As a result of this concern, the SEC adopted ASR No. 250 in 1978, which required the disclosure of NAS fees on the proxy statements of publicly traded companies. The SEC felt that the additional disclosure of NAS fees would help investors assess the potential impairment of auditor independence. This rule was subsequently withdrawn in 1981 after studies concluded that investors likely had no interest in such disclosures (Glezen and Miller 1985).

However, the SEC remained concerned with the provision of NAS, and the issue was taken up again in the late 1990s. The SEC was responding to reports of significant increases in NAS. For example, Byrnes, McNamee, Brady, and Lavelle (2002) find that by 1999 NAS had grown to comprise 51 percent of public accounting fees. In another study, Abbott, Parker, Peters, and Rama (2003) find that over 96 percent of companies purchased NAS from their auditors, and of these firms; over 50 percent had NAS fees that exceeded their annual audit fee.[6]

The concern that provision of NAS could impair the auditor's independence led the SEC to adopt the Final Rule: Revision of the Commissioners' Auditor Independence Requirements in 2002. These new regulations define auditor independence to be a mental state of objectivity and a lack of bias (SEC 2000). Subsequently, audit firms are banned from providing certain NAS (e.g., bookkeeping, valuation, and actuarial services) to their publicly-listed clients, and clients are mandated to disclose the total fees they pay to their auditors. Clients are required to categorize total fees paid into audit fees, financial information systems design and implementation fees, and all other fees (SEC 2000).

In the wake of multiple accounting scandals, including WorldCom and Enron, U.S. Congress passed the Sarbanes-Oxley Act (SOX) in 2002. As part of SOX, the SEC was granted new enforcement powers, which led to the adoption of new rules regarding the provision of NAS.

[6] The sample period for their study was from February 5, 2001 to June 30, 2001 and included all non-financial firms who provided fee information in their proxy statements as required by SEC rules effective on February 5, 2001.

These rules expanded the number of prohibited NAS to include internal audit service, expert services, and tax court representation. In addition, all non-prohibited NAS services had to be approved by the client's audit committee. The SEC also expanded the fee disclosure requirements to include a separate category for fees paid for Tax Services.

During the legislative and rule-making process, there had been significant discussions related to whether tax services should be a prohibited NAS. However, in their final publication of the rules, the SEC stated:

> The Commission reiterates its long-standing position that an accounting firm can provide tax services to its audit clients without impairing the firm's independence. Accordingly, accountants may continue to provide tax services such as tax compliance, tax planning, and tax advice to audit clients, subject to the normal audit committee pre-approval requirements under 2-01(c)(7). (SEC 2003)

The passage of SOX also created the Public Company Accounting Oversight Board (PCAOB). The PCAOB is charged with regulating public accounting firms that provide attestation services to publicly traded clients to "protect investors and the public interest by promoting informative, accurate and independent audit reports" (PCAOB, n.d.). The Act authorizes the PCAOB to establish new independence standards and rules as well as review the audits performed by public accounting firms.

On July 14, 2004, the PCAOB held a roundtable to discuss auditor independence and tax services. There had been significant media coverage regarding the provision of abusive tax planning strategies, including the promotion of tax shelter activities by public accounting firms. The PCAOB was concerned that the provision of tax consultancy services by the audit firm could lead to the impairment of auditor's independence (PCAOB 2004). These discussions led to three new rules to address independence concerns related to tax services provided by auditing firms. Auditors would now be deemed to lack independence if they entered into contingent fee

arrangements, provided aggressive tax planning, or provided tax services to the management team of audit clients (PCAOB 2005).

2.2 Non-Audit Services and Auditor Independence

Practitioners and researchers continue to debate the effect of NAS on auditor independence, and the literature in this area has not come to any clear consensus. There continues to be significant debate on whether the positive aspects of NAS (i.e., increased efficiency, knowledge spillover) outweigh the negative aspects (i.e., impairment of independence).

The efficiency gained by auditors providing NAS through knowledge spillover is well documented. Abernathy, Rapley, and Stekelberg (2016) find that tax-related NAS reduces tax risk by way of knowledge spillover. Gleason and Mills (2011) investigate whether the presence of tax-related NAS impairs auditor independence as evidenced by subsequent financial reporting restatements. They find that tax-related NAS improves estimates for tax reserves and does not result in increased misstatements. Kinney, Palmrose, and Scholz (2004) investigate both tax-related NAS and other NAS impact on audit quality. They find that firms that purchase tax-related NAS are less likely to have misstatements, but they find the opposite effect for other NAS. De Simone, Ege, and Stomberg (2015) examine the impact of tax-related NAS on internal controls and find that companies that purchase tax-related NAS are significantly less likely to disclose material internal control weaknesses. Cook and Omer (2013) find that the likelihood of financial restatements did not change for firms that discontinued procuring tax services from their auditor. They interpret their results as evidence that "payments of tax-service fees to auditors do not result in economic bonding that degrades financial statement quality." In summary, these studies suggest that tax-related NAS does not impair auditor independence, but they can improve audit quality through knowledge spillover.

Other studies focused on audit quality find contrasting results regarding the effect of NAS. Lennox (2016) investigates whether the PCAOB rules restricting tax-related NAS improves audit quality, as proxied by a reduction in financial misstatements and going concern opinions. He finds no change in audit quality after the implementation of the new rules, which indicates that the PCAOB restrictions on tax-related NAS did not improve audit quality.

Alternatively, Gul, Tsui, and Dhaliwal (2006) study the effect of the financial disclosures of NAS on market reaction to earnings news in Australia. They find that the earnings response coefficient (ERC) is negatively associated with NAS. Krishnan, Sami, and Zhang (2005) examine whether investors perceive a lack of independence when firms purchase NAS from their auditors. Their results show a negative association between the ratio of NAS and the ERC. The results from these two studies suggest that investors perceive the mere presence of NAS as impairing the auditor's independence.

Cook, Huston, and Omer (2008) examine the relation between tax-related NAS and earnings management. They find that higher fees paid to auditors for tax services are associated with greater reduction in effective tax rates (ETRs) in third and fourth quarter earnings releases. Clients who did not use their auditors for tax services did not experience the same reduction in their ETRs. They interpret these results as demonstrating increased earnings management opportunities for firms that purchased tax-related NAS. They further suggest that regulatory restrictions on tax NAS could lead to higher quality audits.

Finally, Francis (2006) provides a review of the extant literature regarding the effect of NAS on audit quality and conclude that the research suggests NAS may create the perception of reduced auditor independence; "however, there is no smoking gun evidence linking NAS with audit failures."

2.3 Impact of PCAOB Regulation on Non-Audit Services

Researchers have also been interested in the impact of the introduction of PCAOB regulations on the demand for non-audit services. Omer, Bedard, and Falsetta (2006) examine the changes in the market for NAS during the period Congress debated the provisions of SOX, which had the potential to prohibit these services. They find that during their sample (2000-2002) clients with long-term relationships were more likely to continue to use their auditors for their tax needs. Lassila, Omer, and Smith (2010) find that during the years immediately surrounding the passage of SOX, firms with higher operating complexity and strong corporate governance were more likely to continue to purchase tax-related NAS. Similar to Kinney et al. (2004) and Cook and Omer (2013), their findings suggest that tax-related NAS is fundamentally different from other NAS, and that audit committees do not perceive tax-related NAS as impairing auditor independence.

Maydew and Shackelford (2007) find that the overall amounts paid to external auditors for tax service fees decreased sharply between 2001 and 2004. However, total tax fees earned by public accounting firms stayed consistent over the same period. These findings suggest that clients shifted their tax needs to third-party accounting firms to avoid any perception of lack of independence from using their external auditor for tax-related services. In another study, Lennox (2016) finds that clients reduced their purchases of tax-related NAS by as much as 60 percent after the adoption of the PCAOB regulations. These studies demonstrate that changes in the regulatory environment resulted in a steep reduction in client demand for tax-related NAS.

3. Hypothesis Development

Research into the effects of regulatory restrictions on tax-related NAS has also focused on the level of tax aggressiveness. The PCAOB considers a financial transaction to be aggressive

if its primary purpose is tax avoidance (i.e., it lacks a business-purpose other than tax-savings). For a transaction to not be deemed aggressive, it must satisfy the "more likely than not" standard from the Internal Revenue Service (IRS), i.e., a tax position should have a greater than 50 percent chance of prevailing under an IRS challenge (PCAOB Rule 3522). The IRS maintains a list of tax transactions it deems aggressive (referred to as "listed transactions").

There is no universally accepted definition of tax avoidance or tax aggressiveness in the tax literature. However, most researchers use a measure of taxes incurred compared to statutory tax rates (e.g., effective tax rates, book-tax differences) as a proxy for tax avoidance (Hanlon and Heitzman 2010). Balakrishnan, Blouin, and Guay (2012) define a tax aggressive entity as one that pays an unusually low amount of tax given the entity's industry and size. Blouin (2014) suggests tax aggressiveness is more a function of risk, and that low amounts of taxes paid must also be combined with high volatility for taxes to be an indicator that an entity is tax aggressive.

There is mixed evidence from studies that investigate the level of tax aggressiveness of clients who purchase tax-related NAS. Hogan and Noga (2015) find that firms that do not purchase tax-related NAS have higher long-run effective tax rates (ETRs) than firms that purchase tax-related NAS. Cook and Omer (2013) find that firms that dismissed their auditors as tax service providers had subsequently higher ETRs than those firms that retained their auditors for tax services. Finally, McGuire, Omer, and Wang (2012) find that clients who purchased tax services from their auditors had lower ETRs when their auditor is also a tax expert.[7] These studies appear to indicate that clients who use their auditors for tax services are associated with higher levels of tax avoidance.

[7] Tax expertise is measured based on the firm's annual market share in a given industry (SIC) and city (MSA).

In contrast, Klassen, Lisowsky, and Mescall (2016) find that clients who use a third party (non-auditor) to prepare their tax returns as well as those who self-prepare their returns are more tax aggressive than those that use their auditor to prepare their taxes. As part of their study, they interviewed tax practitioners and find that tax professionals are cognizant of the restrictions on providing aggressive tax planning to their audit clients, and tailor their tax strategies to avoid creating issues with PCAOB regulations or giving the appearance of lack of independence. These findings suggest that the types of tax strategies that the auditors market to their clients are on the less aggressive end of the continuum of tax planning strategies.

Although there has been significant amount of research into the effects of APTS on auditor independence and how regulation impacts the demand for APTS, to our knowledge, there has been no empirical research on the supply-side effects of PCAOB regulations on tax aggressiveness. The question of whether there is a limit to the level of aggressiveness in the tax strategies the auditors provide to their clients remains largely unexplored. As auditors are prohibited from providing aggressive tax planning services, there is a point, or "a line in the sand," where auditors are unable to provide incremental tax-savings to their clients. Based on this argument, we predict the following:

H1*: There exists an upper boundary in the relation between auditor-provided tax services and clients' tax avoidance.*

4. Data and Empirical Design

4.1 Research Design and Methodology

Prior studies have used a variety of proxies to measure firm tax avoidance, including variations of effective tax rate (ETR) measures (e.g., GAAP ETR, Cash ETR, and Current ETR), book-tax differences, and unrecognized tax benefits. Each measure captures different

components of a firm's tax avoidance strategy (e.g., tax exemption, tax deferral, income-shifting, tax shelter). The selection of any measure should depend on the research setting (Hanlon and Heitzman 2010).

In our analysis, we use two separate measures of tax avoidance. The first measure is the GAAP effective tax rate (*GAAPETR*), which is calculated by dividing total book tax expense by pre-tax book income less special items for each client *i* in year *t*. *GAAPETR* indicates the relative tax burden of the firm and the expected tax savings from permanent tax strategies. Previous studies document that managers and investor focus on *GAAPETR* has a measure of performance for firms' tax strategy (Hanlon & Heitzman 2010, Graham et al. 2012). However, *GAAPETR* only reflects the tax savings from permanent tax strategies, other strategies such as deferrals and aggressive tax avoidance strategies are not captured.[8] Hence, we also use cash taxes paid effective tax rate (*CASHETR*) as an additional proxy for tax avoidance. *CASHETR* captures the tax benefits from exemption, deferral, and aggressive tax avoidance strategies, providing a more comprehensive measure of the total taxes avoided by the firm in the current year (Dyreng et al. 2008). *CASHETR* is calculated similar to *GAAPETR*, except, we replace total book tax expense in the numerator of the equation with total taxes paid in year *t*.

We proxy for tax planning activities provided by the auditor using total tax fees paid to auditors, consistent with prior research (e.g., McGuire et al. 2012). Total tax fees are disclosed in clients' 10K filings and captured by the *Audit Analytics* database. Ideally, we would prefer to use only the fees paid for tax advisory services, but few firms provide a breakdown of their total tax

[8] Under FIN 48 guidelines, Accounting for Tax Uncertainty, companies should record a tax reserve for tax positions that are less likely than not to be sustained under a tax audit, i.e., aggressive tax strategies. Hence, tax savings from aggressive tax strategies are not reflected in *GAAPETR* if companies apply the FIN 48 rules appropriately.

fees.[9] SEC disclosure rules do not require the breakout of tax compliance versus tax advisory fees. Klassen et al. (2016) find that tax avoidance is increasing in total tax fees reported as fees paid APTS. In their study, Klassen et al. use proprietary tax return data from the Internal Revenue Service (IRS) to investigate the links between APTS and who signed as the preparer on taxpayers' tax returns. They find that 81 percent of companies in their sample purchased some form of APTS (i.e., tax advisory services), but only 20 percent of their sample had the auditor sign their tax return (tax compliance services). Their findings support the use of total tax fees paid to auditors as an acceptable proxy for tax planning.

Consistent with prior research (e.g., McGuire et al. 2012), we control for other characteristics that have been shown to be associated with a firm's motivation and opportunity for tax avoidance. We direct the reader to Hanlon and Heitzman (2010) and Graham, Raedy, and Shackelford (2012) for a comprehensive review of the literature on the association between the tax avoidance and the control variables. We provide a full list of the control variables and their definitions in Appendix A.

Tax planning often involves a number of moving parts, and its implementation and returns can extend beyond a single fiscal year. In addition, an annual measure is subject to volatility and noise (Dyreng et al. 2008) and may not capture the full benefits from the tax strategy. With these concerns in mind, we also conduct our analyses using a longer horizon. We calculate all variables in our analyses over three years (year *t* thru to *t+2*).

[9] The number of clients that provide a breakdown of their total tax fees paid to their auditor has been increasing since 2008. Within our sample, we observe 1,036 clients that provide this breakdown, 692 of which purchased tax advisory fees. Disclosure of the breakdown of fees is not mandatory and the actual allocation of fees between categories is subject to management discretion (Dickens and Higgs 2005), which raises concerns about self-selection bias and the validity of the data. Therefore, to maximize sample size and to avoid potential self-selection bias, we execute our empirical tests using total tax fees paid.

For the tax avoidance proxies, we use three-year cumulative rolling measures (*GAAPETR3* and *CASHETR3*) to represent long-run tax avoidance, following the methodology developed by Dyreng, Hanlon, and Maydew (2008). The three-year GAAP effective tax rate (*GAAPETR3*) is measured as the sum of total tax expense for years *t*, *t+1* and *t+2* divided by the sum of pre-tax book income less special items for years *t*, *t+1*, *t+2*. The three-year cash effective tax rate (*CASHETR3*) is measured as the sum of cash taxes paid for years *t*, *t+1* and *t+2* divided by the sum of pre-tax book income less special items for years *t*, *t+1*, *t+2*.

The three-year measure for auditor-provided tax services (*APTS3*) is the three-year rolling average of *APTS* for year *t*, *t+1*, and *t+2*. All control variables are reconstructed similar to the variable of interest, to be calculated over a three-year time horizon. If the control variable is a ratio, the three-year measure is the sum of the numerator for the year *t* thru *t+2* divided by the sum of the denominator for the year *t* thru *t+2*. For all other control variables, the three-year measure is a simple rolling average for the year *t* thru *t+2*. See Appendix A for definitions.

4.2 Sample Selection

We follow the sample selection process in McGuire et al. (2012) and start with a sample of all observations in the *Audit Analytics* database for the years 2002-2016.[10] *Audit Analytics* provides information on annual fees paid by SEC registrants to their auditor. As we are interested in the effect of PCAOB regulations on U.S. companies, we delete all non-U.S. companies from the sample. Consistent with McGuire et al. (2012), we also eliminate firms that are registered as mutual funds, trusts, limited partnerships or other flow-through entities as these business entities have different tax planning opportunities and incentives. We further eliminate firms with missing

[10] We begin the sample period in 2002 because Sarbanes-Oxley Act of 2002 created the PCAOB and started the debate on restricting non-audit services. Our results are not sensitive to starting the sample in the post PCAOB period (i.e., 2005-2016).

SIC codes as well as restatement observations. This leaves 161,419 client-year observations in our initial sample.

Next, we cross-match the initial sample with observations from the *Compustat* annual database and successfully identify 59,631 client-year observations with available data to calculate the necessary variables. Finally, we eliminate observations with missing values for dependent or independent variables needed for the regression tests for H1.[11] This step results in a final sample of 29,988 client-year observations. Table 1 summaries the sample selection process.

4.3 Empirical Model

To investigate the association between APTS and tax avoidance we specify three different functional forms of the relation between tax fees paid and clients' tax avoidance. We begin with prior literature and define a linear relation between auditor-provided tax fees and tax avoidance of the client (Equation 1). Similar to a number of prior studies (e.g., McGuire et al. 2012, Hogan and Noga 2015), this specification estimates the mean rate of change for each additional dollar invested in tax planning services (i.e., it assumes no diminishing rate of returns).

$$TaxAvoidance_{it}$$
$$= \alpha_0 + \beta_1 APTS_{it} + \beta_2 NOAPTS_{it} + \beta_3 ABACC_{it} + \beta_4 EQINC_{it} + \beta_5 FI_{it} + \beta_6 R\&D_{it} + \beta_7 LEV_{it}$$
$$+\beta_8 PPE_{it} + \beta_9 BTD_{it} + \beta_{10} NOL_{it} + \beta_{11} \Delta NOL_{it} + \beta_{12} ROA_{it} + \beta_{13} SIZE_{it} + \beta_{14} CASH_{it} + \beta_{15} DEP_{it}$$
$$+\beta_k INDUSTRY\ FIXED\ EFFECTS + \beta_j YEAR\ FIXED\ EFFECTS + \varepsilon_{i,t} \qquad (1)$$

The dependent variable, *Tax Avoidance*, is represented in the equation by one of four proxies for tax avoidance (*GAAPETR*, *CASHETR*, *GAAPETR3*, or *CASHETR3*). This equation is

[11] Our sample includes clients that report zero for APTS, our inferences are qualitatively similar if we restrict our sample to non-zero tax fees observations.

the baseline model and is used to establish the link documented in prior research, i.e., APTS is associated with lower levels of effective tax rates. However, this model will not indicate whether this association exhibits diminishing returns. We expect the coefficient on β_1 to be negative. We include an indicator term (*NOAPTS*) set equal to 1 when *APTS* =0, to control for client-years when no tax services are procured from the auditor, zero otherwise.

To test H1, we use two common non-linear functional models that exhibit diminishing returns behavior to investigate whether the association between *APTS* and tax avoidance changes as clients become more tax aggressive. Our first non-linear function is a polynomial regression. We modify Eq. 1 to include a quadratic term for auditor-provided tax fees ($APTS^2$) as specified below:

$$TaxAvoidance_{i.t}$$
$$= \alpha_0 + \beta_1 APTS_{i.t} + \beta_2 APTS^2{}_{i.t} + \beta_3 NOAPTS_{i.t} + \beta_4 ABACC_{i.t} + \beta_5 EQINC_{i.t} + \beta_6 FI_{i.t}$$
$$+\beta_7 R\&D_{i.t} + \beta_8 LEV_{i.t} + \beta_9 PPE_{i.t} + \beta_{10} BTD_{i.t} + \beta_{11} NOL_{i.t} + \beta_{12} \Delta NOL_{i.t} + \beta_{13} ROA_{i.t}$$
$$+\beta_{14} SIZE_{i.t} + \beta_{15} CASH_{i.t} + \beta_{16} DEP_{i.t} + \varepsilon_{i,t} \qquad (2)$$

We expect the coefficient on β_1 to be negative and the coefficient on β_2 to be positive, consistent with effective tax rates falling with greater investment in auditor provided tax services but at a declining rate (i.e., diminishing returns). A benefit of the quadratic regression is that it allows us to test for an inflection or turning point (in addition to diminishing returns) in the relation between tax avoidance and APTS. For example, clients with high levels of effective tax rates, which could be the result of jurisdictional losses or unfavorable tax audits, might engage in more tax planning to mitigate the situation in the future, this would result in a positive association within this subset of clients.

An alternative non-linear specification that captures diminishing returns is the linear-log function. Here, we hypothesize that tax service fees are linear-log with APTS, such that each incremental increase in the investment in tax planning results in a marginally smaller increase in tax savings. We replace APTS in Eq. 1 with the natural log of APTS and use a linear-log model to regress our tax avoidance measures on the log of APTS (*LogAPTS*) along with our control variables in the regression below:

$$TaxAvoidance_{i.t}$$

$$= \alpha_0 + \beta_1 LogAPTS_{i.t} + \beta_2 NOAPTS_{i.t} + \beta_3 ABACC_{i.t} + \beta_4 EQINC_{i.t} + \beta_5 FI_{i.t} + \beta_6 R\&D_{i.t}$$

$$+\beta_7 LEV_{i.t} + \beta_8 PPE_{i.t} + \beta_9 BTD_{i.t} + \beta_{10} NOL_{i.t} + \beta_{11} \Delta NOL_{i.t} + \beta_{12} ROA_{i.t} + \beta_{13} SIZE_{i.t}$$

$$+\beta_{14} CASH_{i.t} + \beta_{15} DEP_{i.t} + \varepsilon_{i,t} \qquad (3)$$

We expect the coefficient on β_1 to be negative, which would support our hypothesis that there is a diminishing return to APTS.

5. Results

5.1 Univariate Analysis

Table 2 presents the descriptive statistics for our sample. The mean (median) *GAAPETR* is 0.2811 (0.3126) and the mean *CASHETR* is 0.2333 (0.2094). The mean (median) tax fees paid to audit firms is $282,900 ($50,600). The descriptive statistics are consistent with the prior literature. Table 3 presents the correlation matrix for the variables in our model. For brevity, we only report the matrix for the annual measures (the matrix for the 3-year measures are qualitatively similar). We report Pearson (Spearman) correlations above (below the diagonal). Correlations generally follow expectations, *APTS* and *LogAPTS* are negatively correlated with our proxies for tax avoidance *GAAPETR*, suggesting that increased investments in auditor tax

services are associated with greater tax avoidance (Mills et al. 1998).[12] Interestingly, the correlation between *CASHETR* and *APTS* (*LogAPTS*) is positive and significant. However, when we exclude clients with *APTS*=0 (i.e., clients that get their tax services from other sources), we obtain a negative correlation, consistent with prior research. The correlations for the control variables are consistent with the prior literature (see Hanlon and Heitzman 2010 for a summary of the determinants of tax avoidance).

In Figure 1, we plot the data using a simple scatterplot to detect any observable pattern in the association between auditor-provided tax services and tax avoidance. Panel A of Figure 1 presents the scatterplot with *GAAPETR* on the y-axis and *APTS* on the x-axis. The contour of the data indicates a diminishing return to APTS, becoming asymptotic with the x-axis as *APTS* increases, consistent with our prediction for *H1*. Moreover, the direction of the association and magnitude appears to be dependent on the client's level of tax avoidance. In Panel B of Figure 1, we re-chart the scatterplot after adjusting firm-year observations by the median *GAAPETR* for each industry-year (based on 2-digit SIC). This adjustment allows us to control for differences across industries and time. The new graph continues to suggest a non-linear association between auditor tax services and tax avoidance that changes direction dependent on the clients' level of tax avoidance. Above the median, there appears to be a clear diminishing return to *APTS*, while below the median suggest a positive association between *APTS* and *GAAPETR*. We construct similar scatterplot graphs for *CASHETR* and observe a similar pattern (untabulated).

[12] The correlations for *APTS* (*LogAPTS*) and *CASHETR* is positive and significant, which is opposite of our expectations. When we examine the correlation matrix for the 3-year measures, the correlations for *APTS3* (*LogAPTS3*) and *CASHETR3* is negative and significant (p-value < 0.0001). This highlights the potential measurement issues with using annual measures (Dyreng et al. 2008). This is one of the reasons we use both annual and 3-year measures for our test of H1.

In Table 4, we conduct univariate quantile regressions between *APTS* and *GAAPETR* in five percentile point increments. Consistent with Figure 1, the table shows a negative association between *APTS* and *GAAPETR* for higher levels of *GAAPETR* (less tax aggressive clients), gradually increasing in magnitude from the 90th to the 50th percentile before tapering off. The negative association is statistically insignificant at the 24th percentile (this translates to *GAAPETR* of 16.23%) before turning positive and significant at the 23rd percentile and below.[13]

This positive association existed at the lower distribution of client's tax aggressiveness is not predicted in our hypothesis. One possible explanation for the positive association below the 24th percentile of *GAAPETR* is that as clients become more tax aggressive, auditors reduce their provision of non-audit services to avoid reputantional risk and violation of PCAOB regulations. A second possible explanation is that clients substitute auditor tax services with tax planning services from third parties (or in-house) sources in order to lower their effective tax rates. In other words, the more tax aggressive clients become, the fewer tax services are purchased from their auditors. Both patterns are consistent with PCAOB regulations reducing the ability/incentive of auditors to provide aggressive tax planning services to their clients. We formally test for non-linearity in our multivariate regressions.

5.2 Multivariate Analyses

Table 5, Panel A, presents the results of the pooled cross-sectional regressions of our three functional forms with annual proxies for tax avoidance (*GAAPETR, CASHETR*) as the dependent variables. For brevity, the coefficients for industry and year fixed effects are not presented. The control variables are, in general, significantly associated with tax avoidance in the

[13] In untabulated analysis, we apply locally weighted scatterplot smoothing (LOWESS), a non-parametric regression that allows the functional form of the relationship to be determined by the data. The fitted LOWESS curve also indicates that the relation between GAAPETR and APTS is non-linear, moving from negative to positive as the level of tax avoidance increase.

expected direction across all six specifications, consistent with prior research. Note, lower levels of *GAAPETR (CASHETR)* are indicators of higher levels of tax avoidance.

Columns (1) and (2) report the results of the test of the linear function (Eq. 1). When using *GAAPETR* as our proxy for tax avoidance (column 1), we find a negative and significant coefficient on *APTS* (coeff. = -0.0189, p-value < 0.01). We observe a similar negative association between *APTS* and *CASHETR* as our proxy for tax avoidance. However, the magnitude of the coefficient is smaller (coeff. = -0.0074, p-value < 0.01). Together, these results are consistent with the prior literature (e.g., Mills et al. 1998), which documents that greater investments in auditor-provided tax services are associated with higher levels of tax avoidance as evidenced by lower effective tax rates.

The results for Eq. 2 (the quadratic function) are presented in columns (3) and (4) of Table 5, Panel A. When using *GAAPETR* as the tax avoidance proxy, the coefficient on *APTS* is negative and significant (coeff. = -0.0309, p-value<0.01), and the coefficient on $APTS^2$ is positive and significant (coeff. = 0.0034, p-value<0.05). Both coefficients are consistent with auditor tax advisory services increasing clients' tax avoidance, but at a diminishing rate, consistent with H1. However, when we use *CASHETR* as the dependent variable in column (4), the coefficient on *APTS* is negative but statistically insignificant, the coefficient on $APTS^2$ is also negative but statistically insignificant.

The inconclusive results for *CASHETR* in column (4) could be indicative that 1) the functional form is not quadratic, or 2) that *CASHETR* is a noisy proxy. Cash effective tax rate is a broad measure that captures different forms of tax avoidance, both deferral and permanent tax strategies (Hanlon and Heitzman 2010). In their survey paper, Graham et al. (2012), find that clients prefer tax strategies that result both in tax savings and improvements to earnings (i.e.,

permanent tax strategies). Therefore, it is less likely that clients will request help with tax deferral strategies from their auditors (or other third parties). In the untabulated analysis, we use temporary book-tax differences (based on the model in Hanlon 2003) as the dependent variable in equations (1) thru (3) as a proxy for deferral tax strategies. The results show a negative association between temporary book-tax differences and APTS, consistent with the argument that clients are less likely to engage their auditor for tax deferral strategies. The findings for deferral tax strategies potentially explains the weaker results for *CASHETR*.

Finally, in columns (5) and (6) of Panel A, we estimate Eq. 3 (the linear-log function). When using *GAAPETR* as our tax avoidance proxy, the coefficient on *LogAPTS* is negative and significant (coeff. = -0.0434, p-value < 0.01) consistent our hypothesis that APTS are associated with a positive but diminishing association with tax avoidance. The results with *CASHETR* as our proxy for tax avoidance also show a negative and statistically significant association for *LogAPTS*, (coeff. = -0.0147, p-value < 0.05) in support of H1.

In Panel B of Table 5, we repeat the main analyses of the effect of APTS on tax avoidance, substituting long-run (3-year) measures for the annual measures in equations (1) thru (3). As discussed in section 4.1, the benefits from investments in tax planning might not materialize contemporaneously. The proxies for tax avoidance are now *GAAPETR3* and *CASHETR3*, measured over years *t* to *t+2*.

In columns (1) and (2), we find a negative and significant association between auditor-provided tax services (*APTS3*) and tax avoidance (*GAAPETR3*, p-value <0.01, *CASHETR*, p-value <0.10). The results are consistent with the prior literature and the results from the linear model in Panel A and indicates that auditor-provided tax services result in higher levels of tax avoidance in the long-run, as evidenced by lower effective tax rates. The larger magnitude of the

coefficient on *GAAPETR3* (-0.0156 vs. -0.0053) also suggests that the auditor provided tax strategies which have a greater impact on earnings than for cash flows. Such result is consistent with audit firms providing tax planning strategies that improve clients' GAAP earnings (Graham et al. 2012; Klassen et al. 2016).

Columns (3) and (4) of Table 5, Panel B show the results from using three-year measures in Eq. (2). When using the three-year GAAP ETR (*GAAPETR3*) tax avoidance proxy in column (3), we find that *APTS3* is negative and significant (coeff. = -0.0209, p-value <0.01) and the coefficient on $APTS3^2$ is positive but not significant. Column (4) shows the results with *CASHETR3* as the dependent variable; we do not obtain a statistically significant result for *APTS3* or $APTS3^2$. These results are similar to those from the annual (1-year) test in column (4) of Panel A, suggesting that CashETR3, being a broader measure, may be a noisy proxy for the tax avoidance strategy provided by its auditor.

Finally, we test Eq. (3) using the three-year measures, the results of which are shown in columns (5) and (6) of Panel B, Table 5. In column (5), when we estimate Eq. (3) with *GAAPETR3* as the dependent variable, we find that the coefficient on *LogAPTS3* is negative and significant (coeff. = -0.0347, p-value <0.01). Column (6) shows the result from estimating Eq. (3) using *CASHETR3;* we also find a negative but insignificant association between auditor-provided tax services and tax avoidance.

In summary, the results from Table 5 suggest that clients who use their auditors for tax advisory services, experience lower effective tax rates, consistent with prior literature. However, we also find evidence of a diminishing return in the association between auditor tax services and clients' tax avoidance (*GAAPETR*, and *CASHETR* to a lesser extent), consistent with our hypothesis. We interpret the diminishing returns as auditors increasingly find it challenging to

provide additional tax strategies that save tax dollars while maintaining compliance with PCAOB regulations not to provide aggressive tax strategies.

5.3 Alternative Research Design

While the evidence in Table 5 is consistent with our hypothesis, it does not provide strong empirical evidence on whether audit firms comply with PCAOB's restrictions on the non-provision of aggressive tax strategies. That is, both non-linear models, by construct, assume a continuous relation between APTS and tax avoidance. As shown in Figure 1, the scatterplots provide visual cues that the association, including the direction, between APTS and clients' tax avoidance changes depending on the level of aggressiveness of the client. For example, clients with high effective tax rates might incur higher tax advisory services to restructure their tax operations to reduce future effective tax rates. In cases where high effective tax rates are the result of ongoing tax audits, the client may pay higher tax fees for tax controversy services. Either scenario results in a positive association between APTS and tax avoidance. Lastly, if audit firms are complying with PCAOB regulations, then we should fail to observe a correlation (linear or non-linear) between APTS and the most tax aggressive firms.

To address these issues, we extend our empirical analyses. First, we re-estimate equations (1), (2), and (3) within quartiles. Observations are sorted into quartiles each year based on the clients' annual effective tax rate for that year. The first quartile comprises clients with the lowest effective tax rates (i.e., the most tax aggressive clients with mean *GAAPETR*= 0.0469, mean *CASHETR*= 0.0184) and the fourth quartile is made up of clients with effective tax rates near or above the U.S. statutory rate (i.e., the least tax aggressive clients with mean *GAAPETR*= 0.4757,

CASHETR =0.5073).[14] Decomposing the sample in quartiles allows us to test for changes in the relation between APTS and tax avoidance dependent on the clients' level of tax aggressiveness.

Table 6 reports the results of the regressions for the four separate quartiles using annual measures of tax avoidance. Once again, columns 1 and 2 provide results using the linear functional form while columns 3 and 4 (5 and 6) present results for the quadratic (linear-log) functional form. Results are qualitatively similar across all three functional forms. For brevity, we will only discuss the results for the linear-log specification. We observe a negative and significant association between *LogAPTS* and *GAAPETR* in the 2nd and 3rd quartiles (p-value <0.01 and p<0.01). This result indicates that clients who are in the middle quartiles of tax avoidance are able to reduce their GAAP ETRs by increasing their investment in auditor tax advisory services, consistent with our full-sample analyses. However, when we examine the fourth quartile (i.e., the least tax aggressive clients), we find a positive and significant coefficient on *LogAPTS* (coeff. = 0.0467, p-value <0.01) consistent with the pattern we observe in Figure 1. We observe similar results when *CASHETR* is used as the proxy for tax avoidance (coeff. = 0.0427, p-value <0.01). Clients in the 4th quartile have tax rates that are generally above the U.S. statutory rate (minimum CASHETR for 4th Quartile = 0.293, untabulated). We interpret the positive association as these clients making investments in tax advisory services to restructure operations to lower future effective tax rates or to procure assistance with tax controversy.

Next, we discuss the results for the first quartile (i.e., the most tax aggressive clients). Across all three functional forms, we find a positive and significant association between auditor tax services and GAAP effective tax rates. We interpret the positive association among the most

[14] Clients are placed into quartiles on a yearly basis. In general, GAAP and Cash ETRs are decreasing over the time period of our sample, therefore the cutoffs also trend downward. For example, clients in the 25th percentile (Q1) in 2002 had GAAP ETR's of 20.39% or less, however in 2016 clients in the 25th percentile (Q1) had GAAP ETR's of 14.85% or less.

tax aggressive firms as auditors reducing their level of tax advisory services to these clients to avoid regulatory and litigation risks. However, we do acknowledge that we cannot conclude from the evidence whether it is the auditor or the client that is disengaging. Nonetheless, the positive association is consistent with the most tax aggressive clients procuring their tax strategies from non-auditor, either in-house or third parties (Klassen et al. 2016).

The results from the quartile regressions indicate that the effect of APTS differs depending on the client's level of tax avoidance. Consistent with our main results, we find evidence of a negative but diminishing return to APTS for GAAP ETRs in the middle quartiles of the tax avoidance spectrum. However, we find evidence that firms with high effective tax rates increase their purchases of APTS, possibly to reduce future effective tax rates or obtain assistance with current tax controversy. We also find empirical evidence of a positive association between APTS and tax avoidance for the most tax aggressive clients. Together, these findings suggest that the average audit firm is complying with the PCOAB regulations not to supply aggressive tax strategies to their audit clients. Although this does not nullify the anecdotal evidence we observe in tax court cases (e.g., Caterpillar and PwC), it does suggest that these events are not reflective of systematic behaviors among audit firms.

5.4 Cross-Sectional Analysis

Besides changes in the relation between APTS and tax avoidance across the tax avoidance continuum, the relation can also be affected by audit firm or client characteristics. In this section, we perform three additional cross-sectional analyses based on audit firm and client characteristics that have been shown in the prior literature to affect the relationship between the

audit firms and their clients. For these cross-sectional analyses, we limit our tests to the linear-log function form and annual measures of tax avoidance for brevity.

Since the enactment of PCAOB regulations in 2006, several recent events have driven the PCAOB to review the provision of non-audit services. It is plausible that PCAOB regulations have lost some of their deterrence effect over the years. In addition, there has been a significant resurgence in advisory fees as a major source of revenue for audit firms (Rapoport 2018). The growth in the advisory market and competition for market share could lead auditors to be more aggressive in their tax advisory services to retain clients. In our first cross-sectional test, we conduct trend analysis to examine whether audit firms have become more tax aggressive over the years. We add a trend variable (*TIME)* into Eq. (3), *TIME* is computed as the current fiscal year minus 2002, the first fiscal year in our sample. We interact *TIME* with *LogAPTS* to investigate how the relation between auditor tax services and tax avoidance has changed over time. [15]

The results of our trend analysis are presented in columns (1) and (2) of Table 7. The coefficient on the interaction term *LogAPTSxTIME* is negative and statistically significant (coeff. = -0.0023, p-value <0.01) where *GAAPETR* is the dependent variable. The coefficient on the interaction term in column (2), where *CASHETR* is the dependent variable, is not significant. The results in column (1) suggest an increase audit firms' engagement in aggressive tax planning over time, which should be an area of concern for PCAOB. In additional analysis (untabulated), we substitute *TIME* with an indicator variable for each fiscal year and interact the indicator variables with *LogAPTS* to identify the specific years when the negative association increases. These results indicate that the increasingly negative association occurs in fiscal years 2009 and

[15] In untabulated analysis, we investigate whether the association between auditor tax services and clients' tax avoidance differs for Big Four versus non-Big Four firms. We fail to find evidence of a differential effect. However, the lack of significance could be attributed to the small number of non-Big Four firms in the sample.

2016. Given the absence of a monotonic trend, we exercise caution in concluding there has been an increase tax aggressiveness by audit firms.

Next, we examine whether significant tax advisory fees lead to economic bonding between the audit firm and the client, making the audit firm inclined to provide more tax aggressive strategies to retain their client. We proxy for the importance of tax advisory fees relative to audit fees, by computing the ratio of *APTS* to total fees (audit and non-audit) collected from that client. The higher the ratio, the more important the tax service line is in the decision to retain the client. To facilitate interpretation of the interaction term, we convert the ratio into an indicator variable, *BONDING*, set equal to 1 if the ratio of *APTS* to total fees is above the median for the sample, zero otherwise. Results for the economic bonding cross-sectional analysis is presented in columns (3) and (4) of Table 7. The coefficient on the interaction term *LogAPTSxBONDING* is not significant in either column, suggesting that the economic bonding does not influence the relation between APTS and tax avoidance.

Finally, we examine whether the association between APTS and client tax avoidance is different for small clients versus large clients. The audit and tax literature has argued that client size is a determinant in an audit firm's ability to be independent in its relationship with its client. Larger clients tend to generate larger fees, which can lead to the auditor becoming economically dependent on the client (Carson, Fargher, Geiger, Lennox, Raghunandan and Willekens 2013; DeFond and Zhang 2014). Larger clients may be able to exert more pressure on the audit firm to 'push the envelope' on the aggressiveness of the tax strategies offered in hopes of retaining the client. To evaluate whether client size has implications for the association between APTS and tax avoidance, we create an indicator variable to partition clients (above and below the median of firm-year observations) and interact this term with *LogAPTS*. The results are presented in

columns (5) and (6) of Table 7. We find a negative but insignificant relation on the interaction term (*LogAPTSxLARGECLIENT*) for *GAAPETR*. However, for *CASHETR* the results indicate a negative and significant coefficient (p-value<.05) on the interaction term. The latter result indicates that larger clients receive a larger return on their investments in tax planning. On the one hand, the finding can be attributed to audit firms being more tax aggressive for large clients. On the other hand, large clients may have greater opportunities to implement sophisticated tax strategies that generate greater returns.

6. Conclusion

In this study, we examine the relation between auditor-provided tax services and client tax avoidance. Although the prior literature has documented that clients can increase their tax avoidance through the purchase of APTS, to our knowledge, this is the first study to examine the functional form of this association explicitly, and how PCAOB regulations affect the association. The analyses in this study show that the association is sensitive to the client's level of tax avoidance and that PCAOB regulations appear to constraint auditors from providing tax aggressive strategies to their clients.

Consistent with our hypothesis, we find empirical evidence that clients who purchase tax services from their auditors experience a negative but declining return in their effective tax rates. Moreover, we observe that the association differs depending on the client's relative level of tax avoidance. Of particular interest, we find a positive association between APTS and tax avoidance for clients with the lowest effective tax rates, i.e., the most tax aggressive clients. These results are consistent with auditors complying with PCAOB regulations not to provide aggressive tax planning services to their clients and lends support to the effectiveness of current supply-side

regulations. In fact, the positive association, suggest the most tax aggressive clients are procuring their tax planning from sources other than the auditor.

In cross-sectional analyses, we find limited evidence that the association between APTS and clients' tax avoidance has strengthened since the PCAOB regulations were enacted in 2006. This finding suggests that PCAOB regulations may have lost some of their deterrence effects and a review of current regulations may be warranted. We find no evidence of economic bonding from the provision of tax advisory services, measured as the ratio of tax service fees to total fees. However, we do find that larger clients have larger returns from investing in tax planning than smaller clients. This finding could be interpreted as evidence of economic bonding between the auditor and these larger clients, which could result in auditors "pushing the envelope" when it comes to the tax strategies they provide to their larger clients. Alternatively, the larger return could be the result of larger clients having greater opportunity to employ more sophisticated tax strategies.

Collectively, the results of our study provide broad empirical evidence of the effect of APTS on tax avoidance and should be of interest to the PCAOB with regard to the effectiveness of current regulations on non-audit services. Additionally, the findings of a non-linear relation between APTS and tax avoidance has important implications for researchers studying the auditor's role in the tax planning of their clients. Researchers need to be cognizant that the association between APTS and tax avoidance varies depending on the client's level of the tax avoidance, and account for the non-linearity in their research design and hypothesis development.

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Appendix A
Variable Definition

Measures of Tax Avoidance

GAAPETR	Effective tax rate is defined as total tax expense (TXT) divided by pre-tax book income less special items (PI - SPI). ETRs with negative denominators are deleted. The remaining non-missing ETRs are winsorized at 0 and 1.
CASHETR	Cash effective rate is defined as cash taxes paid (TXPD) divided by pre-tax book income less special items (PI - SPI). CASHETRs with negative denominators are deleted. The remaining non-missing CASHETRs are winsorized at 0 and 1.
GAAPETR3	Three-year average GAAP effective tax rate computed by taking the sum of total tax expense from *t* to *t+2* (TXT) divided by sum of pre-tax book income less special items (PI - SPI) over the same period. ETR3s with negative denominators are deleted. The remaining non-missing ETR3s are winsorized at 0 and 1.
CASHETR3	Three-year average cash effective tax rate computed by taking the sum of total cash tax paid from *t* to *t+2* (TXPD) divided by sum of pre-tax book income less special items (PI - SPI) over the same period. CASHETR3s with negative denominators are deleted. The remaining non-missing CASHETR3s are winsorized at 0 and 1.

Variables of Interest

APTS	The total fees paid for auditor provided tax services (in millions)
LogAPTS	The natural log of (1+ APTS)
APTS3	The average of APTS for years *t to t+2*
LogAPTS3	The average of LogAPTS for years *t to t+3*

Control Variables

NOAPTS	Indicator variable equal to 1 if APTS in year *t* is 0; 0 otherwise.
ABACC	Abnormal accruals for year *t* based on performance-adjusted modified Jones Model.
EQINC	Equity income for year *t* (ESUB) scaled by total assets at the beginning of the year (AT).
FI	Pre-tax foreign income for year *t* (PIFO) scaled by total assets at the beginning of the year (AT).
R&D	R&D expense for year *t* (XRD) scaled by total assets at the beginning of the year (AT).
LEV	Long-term debt at the end of year *t* (DLTT) scaled by total assets at the end of the year (AT).

Appendix A (continued)
Variable Definition

Control Variables

BTM	Book-to-market ratio at the end of year *t*, measured as book value of equity (CEQ) divided by market value of equity (PRCC_F x CSHO).
NOL	Indicator variable equal to 1 if there is a tax loss carryforward (TLCF > 0) during year *t*; 0 otherwise.
ΔNOL	Change in tax-loss carryforward (TLCF) from year *t -1* to *t* scaled by total assets at the beginning of the year (AT).
PPE	Net PPE for year *t* (PPENT) scaled by total assets at the beginning of the year (AT).
ROA	Return on assets for year *t*, measured as the ratio of income before extraordinary items (IB) to the average of total assets for the year (AT).
SIZE	Natural log of market value of equity (PRCC_F x CSHO) at the beginning of year *t*.
CASH	Cash holding at the end of year *t* (CHE) divided by total assets at the beginning of the year (AT).
DEP	Depreciation and amortization expense for year *t* (DP) divided by total assets at the beginning of the year (AT).
NOAPTS3	Indicator variable equal to 1 if the sum of APTS for *t* to *t+2* is 0; 0 otherwise.
ABACC3	Average abnormal accruals from year *t* to *t+2* based on performance-adjusted modified Jones Model.
EQINC3	Average equity income from year *t* to *t+2* (ESUB) scaled by average total assets (AT) at the beginning of the year *t* to *t+2*.
FI3	Average pre-tax foreign income from year *t* to *t+2* (PIFO) scaled by average total assets (AT) at the beginning of the year *t* to *t+2*.
R&D3	Average R&D expense from year *t* to *t+2* (XRD) scaled by average total assets (AT) at the beginning of the year *t* to *t+2*.
LEV3	Average long-term-debt (DLTT) at the end of year *t* to *t+2* scaled by average total assets (AT) at the beginning of the year *t* to *t+2*.
BTM3	Average book-to-market ratio at the end of year *t* to *t+2*.
NOL3	Indicator variable equal to 1 if average tax loss carryforward (TLCF) from *t* to *t+2* is positive; 0 otherwise.
ΔNOL3	Sum of the change in tax loss carryforward from *t* to *t+2* scaled by total assets from the beginning of years *t* to *t+2*
PPE3	Average of net PPE (PPENT) from year *t* to *t+2* scaled by average total assets (AT) at the beginning of the year *t* to *t+2*.

Appendix A (continued)
Variable Definition

Control Variables

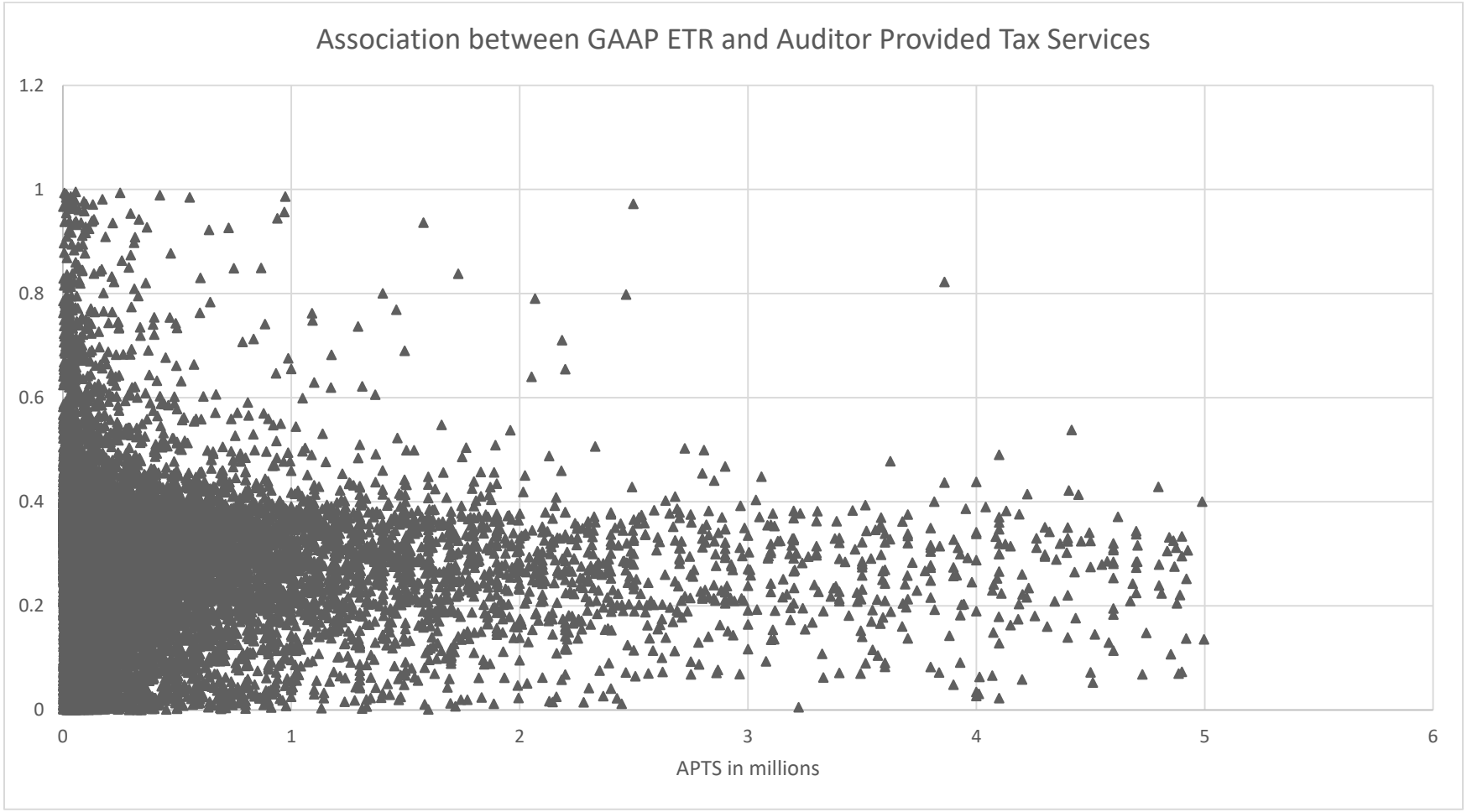
ROA3	Average return on assets from year *t* to *t+2*, measured as the ratio of three-year average income before extraordinary items (IB) to three-year average beginning of the year total assets.
SIZE3	Average natural log of market value of equity (PRCC_F x CSHO) at the beginning of year *t* to *t+2*.
CASH3	Cash holding at the end of year *t* to *t+2* (CHE) divided by average total assets (AT) at the beginning of the year *t* to *t+2*.
DEP3	Depreciation and amortization expense for year t (DP) divided by average total assets (AT) at the beginning of the year *t* to *t+2*.

Additional Variables for Cross-sectional Analysis

TIME	A count variable equal to the fiscal year for a given firm-year observation less the number 2002, which is the first year in the dataset.
BONDING	Indicator variable taking value of 1 if the ratio of client tax to total fees is above the median and 0 otherwise.
LARGECLIENT	Indicator variable taking value of 1 if the client's SIZE variable is above the median for the fiscal year and 0 otherwise.

Figure 1

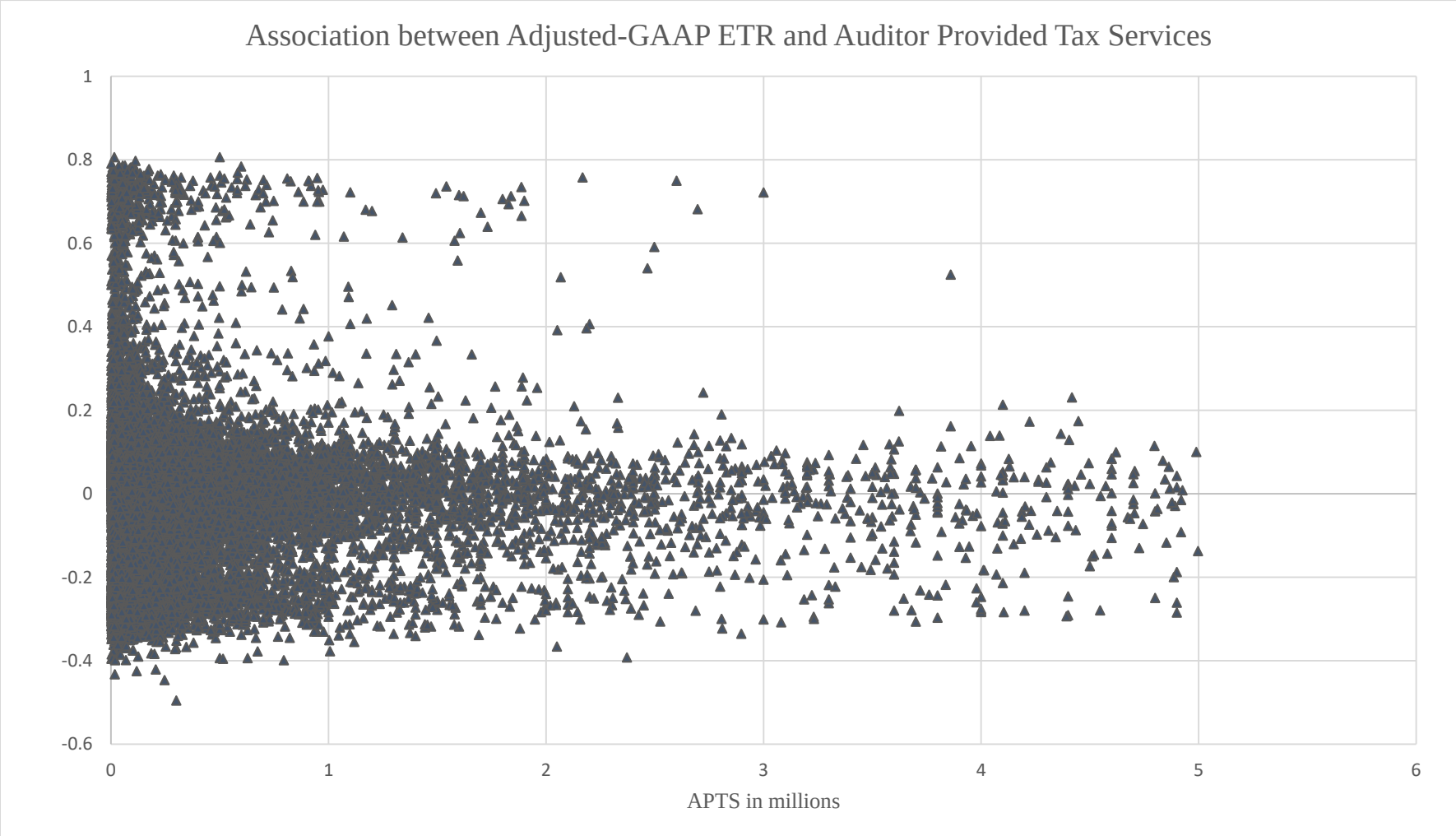
Panel A



The scatterplot above presents the association between fees paid for auditor provided tax services (APTS) and clients' GAAP effective tax rates (GAAPETR). In Panel B below, the effective tax rates are mean-adjusted by industry and year to control for heteroscedasticity among the observations. Both panels indicate a non-linear pattern in the association between the variables. Note, GAAP ETRs above 1 and below 0 have been truncated. APTS is winsorized at the 1st and 99th percentile. Variables are defined in Appendix A.

Figure 1 (continued)

Panel B



The scatterplot above presents the association between fees paid for auditor-provided tax services (APTS) and clients' GAAP effective tax rates (GAAPETR). In Panel B, the effective tax rates are mean-adjusted by industry and year to control for heteroscedasticity among the observations. Both panels indicate a non-linear pattern in the association between the variables. Note, GAAP ETRs above 1 and below 0 have been truncated. APTS is winsorized at the 1st and 99th percentile. Variables are defined in Appendix A.

Table 1
Sample Selection

Client-year observations from Audit Analytics	197,870
Less: Client-year observations of non-U.S. clients	(24,670)
Less: Client-year observations with missing SIC information	(4,683)
Less: Client-year observations with restatements	(7,098)
Less: Client-year observations not cross-matched with Compustat	(101,788)
Less: Client-year observations without sufficient data to calculate control variables	(7,690)
Less: Client-year observations without sufficient data to calculate the dependent variables	(21,953)
Sample of Client-year observations used to estimate equations (1), (2), and (3)	29,988

TABLE 2
Descriptive Statistics

Variable	N	Mean	Standard Deviation	Q1	Median	Q3
GAAPETR	29,988	0.2811	0.1833	0.1742	0.3126	0.3721
CASHETR	29,988	0.2333	0.2126	0.0609	0.2094	0.3309
GAAPETR3	18,257	0.2799	0.1394	0.2148	0.3120	0.3633
CASHETR3	18,257	0.2320	0.1463	0.1259	0.2374	0.3225
APTS	29,988	0.2829	0.6485	0.0000	0.0506	0.2403
LogAPTS	29,988	0.1834	0.3122	0.0000	0.0494	0.2154
APTS3	18,257	0.3205	0.6820	0.0118	0.0751	0.2921
LogAPTS3	18,257	0.2109	0.3392	0.0118	0.0724	0.2563
NOAPTS	29,988	0.2707	0.4444	0.0000	0.0000	1.0000
ABACC	29,988	0.0148	0.1814	-0.0565	0.0040	0.0656
EQINC	29,988	0.0012	0.0051	0.0000	0.0000	0.0000
FI	29,988	0.0166	0.0358	0.0000	0.0000	0.0188
R&D	29,988	0.0282	0.0543	0.0000	0.0000	0.0299
LEV	29,988	0.1759	0.1862	0.0017	0.1305	0.2853
PPE	29,988	0.2780	0.2688	0.0746	0.1841	0.3990
BTM	29,988	0.5500	0.4489	0.2746	0.4654	0.7242
NOL	29,988	0.4769	0.4995	0.0000	0.0000	1.0000
ΔNOL	29,988	-0.0001	0.0884	0.0000	0.0000	0.0004
ROA	29,988	0.0664	0.0738	0.0252	0.0540	0.0949
SIZE	29,988	6.3408	2.1160	5.0140	6.4649	7.7552
CASH	29,988	0.1947	0.2220	0.0345	0.1109	0.2745
DEP	29,988	0.0430	0.0299	0.0234	0.0369	0.0549
NOAPTS3	18,257	0.1560	0.3629	0.0000	0.0000	0.0000
ABACC3	18,257	0.0029	0.0841	-0.0424	0.0004	0.0413
EQINC3	18,257	0.0013	0.0050	0.0000	0.0000	0.0000
FI3	18,257	0.0190	0.0356	0.0000	0.0000	0.0253
R&D3	18,257	0.0244	0.0462	0.0000	0.0000	0.0268
LEV3	18,257	0.1733	0.1684	0.0173	0.1396	0.2753
PPE3	18,257	0.2782	0.2563	0.0823	0.1919	0.3959
BTM3	18,257	0.4942	0.3215	0.2772	0.4431	0.6530
NOL3	18,257	0.5305	0.4991	0.0000	1.0000	1.0000
ΔNOL3	18,257	-0.0018	0.0449	-0.0014	0.0000	0.0000
ROA3	18,257	0.0692	0.0603	0.0324	0.0595	0.0959
SIZE3	18,257	7.8511	1.9316	6.6542	7.9083	9.1176
CASH3	18,257	0.1795	0.1879	0.0398	0.1096	0.2554
DEP3	18,257	0.0413	0.0265	0.0240	0.0363	0.0523

All variables are defined in Appendix A. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for ETR and CASHETR, which are winsorized at 0 and 1, respectively.

TABLE 3

Spearman/Pearson Correlation Matrix

Panel A: Annual Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
GAAPETR	**1.0000**	**0.3066**	**-0.0521**	**-0.0532**	**0.0110**	**-0.0871**	-0.0085	**-0.0585**	**-0.1426**	**-0.0338**	**0.0188**	**0.0166**	**-0.0839**	**-0.0158**	**-0.0488**	**0.0212**	**-0.0694**	-0.0029
	<.0001	<.0001	<.0001	<.0001	0.0560	<.0001	0.1412	<.0001	<.0001	<.0001	0.0011	0.0041	<.0001	0.0061	<.0001	0.0002	<.0001	0.6169
CASHETR	**0.3323**	**1.0000**	0.0066	**0.0116**	**-0.0231**	**-0.0554**	**-0.0259**	**-0.0103**	**-0.0790**	**-0.0766**	**-0.1151**	**0.0568**	**-0.0754**	**-0.0373**	**-0.1045**	**0.0283**	**-0.0472**	**-0.0406**
	<.0001	<.0001	0.2526	0.0446	0.0001	<.0001	<.0001	0.0736	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
APTS	**-0.0683**	**0.0578**	**1.0000**	**0.9649**	**-0.2658**	**-0.0349**	**0.0913**	**0.1863**	**-0.0112**	**0.1148**	**-0.0430**	**-0.1008**	**0.0506**	**-0.0214**	**-0.0402**	**0.4190**	**-0.0938**	**-0.0454**
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0530	<.0001	<.0001	<.0001	<.0001	0.0002	<.0001	<.0001	<.0001	<.0001
LogAPTS	**-0.0683**	**0.0578**	**1.0000**	**1.0000**	**-0.3579**	**-0.0466**	**0.0924**	**0.2177**	-0.0078	**0.1360**	**-0.0456**	**-0.1182**	**0.0689**	**-0.0275**	**-0.0474**	**0.4745**	**-0.1021**	**-0.0489**
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.1793	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
NOAPTS	**0.0272**	**-0.0447**	**-0.7774**	**-0.7774**	**1.0000**	**0.0469**	**-0.0124**	**-0.1185**	**-0.0290**	**-0.0431**	**0.0295**	**0.0830**	**-0.0401**	**0.0216**	**0.0152**	**-0.2139**	**0.0201**	**0.0252**
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0323	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0002	0.0083	<.0001	0.0005	<.0001
ABACC	**-0.0679**	**-0.0517**	**-0.0694**	**-0.0694**	**0.0472**	**1.0000**	**0.0231**	**-0.0149**	**0.0121**	**0.0153**	**0.0497**	**0.0194**	**0.0283**	**0.0242**	**0.1633**	**-0.1279**	**-0.0205**	0.0056
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0001	0.0097	0.0367	0.0080	<.0001	0.0008	<.0001	<.0001	<.0001	<.0001	0.0004	0.3293
EQINC	**-0.0317**	**-0.0100**	**0.1219**	**0.1219**	**-0.0522**	**0.0318**	**1.0000**	**0.0512**	**-0.0638**	**0.0356**	**0.0642**	**-0.0098**	**-0.0308**	-0.0031	**0.0414**	**0.1042**	**-0.0707**	**-0.0172**
	<.0001	0.0825	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0891	<.0001	0.5957	<.0001	<.0001	<.0001	0.0029
FI	**-0.1230**	**0.0582**	**0.2880**	**0.2880**	**-0.1655**	**-0.0168**	**0.0847**	**1.0000**	**0.1458**	**-0.0643**	**-0.0654**	**-0.1419**	**0.1231**	**-0.0229**	**0.2085**	**0.2491**	**0.1221**	**-0.0104**
	<.0001	<.0001	<.0001	<.0001	<.0001	0.0035	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0001	<.0001	<.0001	<.0001	0.0723
R&D	**-0.2097**	**-0.0611**	**0.1096**	**0.1096**	**-0.0873**	**-0.0480**	**-0.0737**	**0.2690**	**1.0000**	**-0.2371**	**-0.2643**	**-0.1603**	**0.1243**	**0.0156**	**0.1099**	**-0.0596**	**0.4552**	0.0002
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0070	<.0001	<.0001	<.0001	0.9696
LEV	**-0.0343**	**-0.0835**	**0.1740**	**0.1740**	**-0.0667**	**0.0308**	**0.1424**	-0.0009	**-0.2563**	**1.0000**	**0.3129**	**-0.1362**	**0.0706**	**-0.0467**	**-0.2163**	**0.1824**	**-0.3759**	**0.1234**
	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.8724	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
PPE	**0.0511**	**-0.0779**	**0.0145**	**0.0145**	-0.0093	**0.0560**	**0.1144**	**-0.0593**	**-0.2421**	**0.3418**	**1.0000**	0.0080	**-0.1135**	**-0.0335**	**-0.0293**	**0.1097**	**-0.3047**	**0.5306**
	<.0001	<.0001	0.0118	0.0118	0.1069	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.1646	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
BTM	**0.0157**	**0.0128**	**-0.1224**	**-0.1224**	**0.0692**	**0.0831**	0.0036	**-0.1366**	**-0.1842**	**-0.0606**	**-0.0108**	**1.0000**	**-0.0454**	**-0.0150**	**-0.3030**	**-0.2798**	**-0.1597**	**-0.1093**
	0.0065	0.0265	<.0001	<.0001	<.0001	<.0001	0.5379	<.0001	<.0001	<.0001	0.0615	<.0001	<.0001	0.0093	<.0001	<.0001	<.0001	<.0001
NOL	**-0.1384**	**-0.1063**	**0.0834**	**0.0834**	**-0.0401**	**0.0222**	-0.0081	**0.1664**	**0.1533**	**0.0725**	**-0.1025**	**-0.0475**	**1.0000**	**-0.0558**	**-0.0716**	**0.0633**	**0.0238**	**0.0194**
	<.0001	<.0001	<.0001	<.0001	<.0001	0.0001	0.1599	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0008
ΔNOL	-0.0012	**-0.0635**	**-0.0592**	**-0.0592**	**0.0304**	**0.0100**	**-0.0223**	**-0.0153**	**0.0254**	**-0.0686**	**-0.0555**	**-0.0220**	**-0.0385**	**1.0000**	**0.1247**	**-0.0622**	**0.0500**	**-0.0347**
	0.8333	<.0001	<.0001	<.0001	<.0001	0.0837	0.0001	0.0079	<.0001	<.0001	<.0001	0.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
ROA	**0.0718**	**0.0410**	-0.0074	**-0.0074**	**-0.0103**	**0.0210**	-0.0069	**0.1592**	**0.1030***	**-0.2668**	0.0052	**-0.4201**	**-0.0824**	**0.1092**	**1.0000**	**0.0206**	**0.3174**	**0.0392**
	<.0001	<.0001	0.2026	0.2026	0.0748	0.0003	0.2315	<.0001	<.0001	<.0001	0.3658	<.0001	<.0001	<.0001	<.0001	0.0004	<.0001	<.0001
SIZE	-0.0085	**0.0912**	**0.4573**	**0.4573**	**-0.2173**	**-0.1120**	**0.2028**	**0.2911**	-0.0061	**0.2608**	**0.1270**	**-0.2906**	**0.0718**	**-0.0767**	**0.0958**	**1.0000**	**-0.1149**	**-0.0282**
	0.1392	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.2921	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
CASH	**-0.0782**	**0.0115**	**-0.0248**	**-0.0248**	**-0.0105**	**-0.0836**	**-0.1249**	**0.1345**	**0.3962**	**-0.5134**	**-0.3470**	**-0.1946**	**0.0555**	**0.0517**	**0.2755**	**-0.0850**	**1.0000**	**-0.0943**
	<.0001	0.0465	<.0001	<.0001	0.0696	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
DEP	0.0070	**-0.0379**	-0.0015	-0.0015	0.0031	**-0.0296**	**-0.0129**	-0.0045	0.0014	**0.1499**	**0.6216**	**-0.1315**	**0.0284**	**-0.0302**	**0.0441**	**0.0123**	**-0.1034**	**1.0000**
	0.2286	<.0001	0.8013	0.8013	0.5919	<.0001	0.0251	0.4347	0.8135	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0331	<.0001	<.0001

All variables are defined in Appendix A. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR and CASHETR, which are winsorized at 0 and 1, respectively. Coefficients shown in bold are significant at p-value < 0.10 (two-tailed test).

TABLE 4

Univariate Quantile Regression of Auditor-Provided Tax Service Fees on GAAPETR (CASHETR)

Percentile	Coefficient	Std. errors	T-stat
GAAPETR			
90th	-0.0165 ***	0.0017	-9.8378
85th	-0.0163 ***	0.0008	-20.9491
80th	-0.0182 ***	0.0010	-17.5665
75th	-0.0211 ***	0.0011	-19.3618
70th	-0.0223 ***	0.0012	-18.4969
65th	-0.0248 ***	0.0014	-17.9451
60th	-0.0259 ***	0.0013	-20.0934
55th	-0.0271 ***	0.0013	-20.3751
50th	-0.0275 ***	0.0016	-21.4646
45th	-0.0262 ***	0.0013	-20.3028
40th	-0.0240 ***	0.0012	-20.5407
35th	-0.0205 ***	0.0012	-17.6870
30th	-0.0140 ***	0.0009	-15.2999
25th	-0.0028 **	0.0009	-3.1245
20th	0.0127 ***	0.0019	6.8792
15th	0.0220 ***	0.0039	5.6043
10th	0.0114 ***	0.0031	3.6579

Percentile	Coefficient	Std. errors	T-stat
25th	-0.0028 ***	0.0009	-3.1245
24th	**0.0008**	**0.0011**	**0.7386**
23rd	0.0025 **	0.0010	2.3998
22nd	0.0066 ***	0.0013	5.1202
21st	0.0086 ***	0.0013	6.6635
20th	0.0127 ***	0.0019	6.8792

No. of obs. = 29,988

This table presents results for univarite quantile regressions of auditor provided tax services on clients' tax avoidance. The dependent variable is APTS, GAAPETR and CASHETR are winsorized at 0 and 1. Variables are defined in Appendix A.

TABLE 5 - Panel A

Regression Results Using One-Year GAAPETR and CASHETR Under Different Functional Forms

	Linear		Quadratic		Logarithmic	
	GAAPETR	**CASHETR**	**GAAPETR**	**CASHETR**	**GAAPETR**	**CASHETR**
Variables	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)
APTS	-0.0189 ***	-0.0074 ***	-0.0309 ***	-0.0022		
	(0.0021)	(0.0028)	(0.0061)	(0.0069)		
APTS^2			0.0034 **	-0.0015		
			(0.0015)	(0.0017)		
LogAPTS					-0.0434 ***	-0.0147 **
					(0.0050)	(0.0063)
NOAPTS	0.0002	-0.0098 **	-0.0016	-0.0090 **	-0.0027	-0.0105 ***
	(0.0033)	(0.0038)	(0.0034)	(0.0040)	(0.0034)	(0.0039)
ABACC	-0.0728 ***	-0.0199 ***	-0.0727 ***	-0.0199 ***	-0.0727 ***	-0.0199 ***
	(0.0074)	(0.0076)	(0.0074)	(0.0076)	(0.0074)	(0.0076)
EQINC	-0.3510	-0.7940 **	-0.3470	-0.7950 **	-0.3460	-0.7970 **
	(0.3190)	(0.3530)	(0.3190)	(0.3530)	(0.3190)	(0.3530)
FI	-0.1130 **	0.0741	-0.1070 **	0.0717	-0.1060 **	0.0752
	(0.0501)	(0.0560)	(0.0502)	(0.0560)	(0.0502)	(0.0560)
R&D	-0.3620 ***	-0.3170 ***	-0.3620 ***	-0.3170 ***	-0.3630 ***	-0.3170 ***
	(0.0413)	(0.0437)	(0.0413)	(0.0437)	(0.0413)	(0.0437)
LEV	-0.0809 ***	-0.0982 ***	-0.0798 ***	-0.0986 ***	-0.0794 ***	-0.0978 ***
	(0.0104)	(0.0120)	(0.0104)	(0.0120)	(0.0104)	(0.0120)
PPE	0.0044	-0.1130 ***	0.0039	-0.1130 ***	0.0038	-0.1130 ***
	(0.0102)	(0.0119)	(0.0102)	(0.0119)	(0.0102)	(0.0119)
BTM	-0.0131 ***	0.0074	-0.0130 ***	0.0074	-0.0130 ***	0.0074
	(0.0047)	(0.0048)	(0.0046)	(0.0048)	(0.0046)	(0.0048)
NOL	-0.0229 ***	-0.0432 ***	-0.0227 ***	-0.0433 ***	-0.0226 ***	-0.0431 ***
	(0.0029)	(0.0035)	(0.0029)	(0.0035)	(0.0029)	(0.0035)
ΔNOL	-0.0239	-0.0788 ***	-0.0237	-0.0789 ***	-0.0237	-0.0788 ***
	(0.0166)	(0.0152)	(0.0166)	(0.0152)	(0.0166)	(0.0152)
ROA	-0.1100 ***	-0.3470 ***	-0.1110 ***	-0.3460 ***	-0.1120 ***	-0.3470 ***
	(0.0298)	(0.0294)	(0.0298)	(0.0294)	(0.0298)	(0.0294)
SIZE	0.0048 ***	0.0065 ***	0.0052 ***	0.0064 ***	0.0053 ***	0.0066 ***
	(0.0010)	(0.0011)	(0.0010)	(0.0011)	(0.0010)	(0.0011)
CASH	-0.0302 ***	-0.0325 ***	-0.0305 ***	-0.0324 ***	-0.0305 ***	-0.0325 ***
	(0.0084)	(0.0094)	(0.0084)	(0.0094)	(0.0084)	(0.0094)
DEP	-0.1710 **	0.4130 ***	-0.1700 **	0.4120 ***	-0.1690 **	0.4130 ***
	(0.0702)	(0.0807)	(0.0702)	(0.0807)	(0.0702)	(0.0807)
Constant	0.2300 ***	0.2180 ***	0.2310 ***	0.2180 ***	0.2310 ***	0.2190 ***
	(0.0539)	(0.0455)	(0.0535)	(0.0456)	(0.0534)	(0.0455)
Observations	29,988	29,988	29,988	29,988	29,988	29,988
Adjusted R^2	0.0681	0.0899	0.0683	0.0899	0.0684	0.0899
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

This table presents results for cross-sectional regressions of auditor provided tax services on tax avoidance. Columns 1, 3 and 5 (2, 4, and 6) use GAAPETR (CASHETR) as the dependent variable. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR and CASHETR, which are winsorized at 0 and 1. Standard errors are robust to heteroscedasticity and clustered at the client level. Variables are defined in Appendix A.

TABLE 5 - Panel B

Regression Results Using Three-Year GAAPETR and CASHETR Under Different Functional Forms

	Linear		Quadratic		Logarithmic	
	GAAPETR3	**CASHETR3**	**GAAPETR3**	**CASHETR3**	**GAAPETR3**	**CASHETR3**
Variables	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)
APTS3	-0.0156 ***	-0.0053 *	-0.0209 ***	0.00517		
	(0.0026)	(0.0032)	(0.0071)	(0.0080)		
APTS3^2			0.0014	-0.0029		
			(0.0017)	(0.0019)		
LogAPTS3					-0.0347 ***	-0.0084
					(0.0061)	(0.0073)
NOAPTS3	0.0040	-0.0087	0.0033	-0.0073	0.0020	-0.0089
	(0.0051)	(0.0055)	(0.0051)	(0.0055)	(0.0051)	(0.0055)
ABACC3	-0.0810 ***	-0.0031	-0.0813	-0.0025	-0.0819 ***	-0.0039
	(0.0213)	(0.0203)	(0.0213)	(0.0203)	(0.0213)	(0.0203)
EQINC3	-0.3390	-0.4760	-0.3380	-0.4770	-0.3420	-0.4860
	(0.4430)	(0.4570)	(0.4430)	(0.4570)	(0.4430)	(0.4560)
FI3	-0.2520 ***	0.0536	-0.2480 ***	0.0467	-0.2450 ***	0.0530
	(0.0650)	(0.0700)	(0.0655)	(0.0702)	(0.0653)	(0.0702)
R&D3	-0.4410 ***	-0.4930 ***	-0.4410 ***	-0.4930 ***	-0.4410 ***	-0.4930 ***
	(0.0555)	(0.0600)	(0.0556)	(0.0599)	(0.0556)	(0.0599)
LEV3	-0.0983 ***	-0.1170 ***	-0.0978 ***	-0.1180 ***	-0.0969 ***	-0.1160 ***
	(0.0141)	(0.0157)	(0.0141)	(0.0157)	(0.0141)	(0.0157)
PPE3	0.0206	-0.1070 ***	0.0204	-0.1070 ***	0.0203	-0.1070 ***
	(0.0138)	(0.0152)	(0.0138)	(0.0152)	(0.0138)	(0.0153)
BTM3	-0.0334 ***	-0.0131	-0.0333 ***	-0.0133	-0.0332 ***	-0.0133
	(0.0090)	(0.0089)	(0.0090)	(0.0089)	(0.0090)	(0.0089)
NOL3	-0.0229 ***	-0.0435 ***	-0.0228 ***	-0.0437 ***	-0.0226 ***	-0.0434 ***
	(0.0034)	(0.0039)	(0.0034)	(0.0039)	(0.0034)	(0.0039)
ΔNOL3	-0.0716	-0.1640 ***	-0.0716	-0.1640 ***	-0.0717	-0.1650 ***
	(0.0443)	(0.0368)	(0.0443)	(0.0368)	(0.0443)	(0.0368)
ROA3	0.0947 *	-0.0511	0.0935 *	-0.0487	0.0922 *	-0.0507
	(0.0492)	(0.0456)	(0.0494)	(0.0457)	(0.0493)	(0.0457)
SIZE3	0.0032 **	0.0018	0.0034 **	0.0014	0.0036 ***	0.0017
	(0.0013)	(0.0015)	(0.0014)	(0.0015)	(0.0014)	(0.0015)
CASH3	-0.0422 ***	-0.0274 *	-0.0424 ***	-0.0269 *	-0.0424 ***	-0.0272 *
	(0.0122)	(0.0143)	(0.0122)	(0.0143)	(0.0122)	(0.0143)
DEP3	-0.2100 **	0.3910 ***	-0.2100 **	0.3900 ***	-0.2090 **	0.3910 ***
	(0.1040)	(0.1140)	(0.1040)	(0.1140)	(0.1040)	(0.1140)
Constant	0.2390 ***	0.2120 ***	0.2390 ***	0.2130 ***	0.2390 ***	0.2130 ***
	(0.0770)	(0.0548)	(0.0768)	(0.0551)	(0.0764)	(0.0547)
Observations	18,257	18,257	18,257	18,257	18,257	18,257
Adjusted R^2	0.1246	0.1618	0.1246	0.1620	0.1248	0.1617
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

This table presents results for cross-sectional regressions of auditor provided tax services on tax avoidance. Columns 1, 3 and 5 (2, 4, and 6) use GAAPETR3 (CASHETR3) as the dependent variable. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR3 and CASHETR3, which are winsorized at 0 and 1. Standard errors are robust to heteroscedasticity and clustered at the client level. Variables are defined in Appendix A.

TABLE 6

Regression Results Using One-Year GAAPETR and CASHETR Under Different Functional Forms at each Quartile

	Linear		Quadratic		Logarithmic	
	GAAPETR	**CASHETR**	**GAAPETR**	**CASHETR**	**GAAPETR**	**CASHETR**
Variables	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)
4th Quartile						
APTS	0.0203	0.0188 ***	0.0449 ***	0.0327 ***		
	(0.0059)	(0.0049)	(0.0135)	(0.0120)		
$APTS^2$			-0.0078 **	-0.0041		
			(0.0037)	(0.0033)		
LogAPTS					0.0467 ***	0.0427 ***
					(0.0119)	(0.0103)
Observations	7,492	7,492	7,492	7,492	7,492	7,492
DV Interquartile Mean	0.4757	0.5073	0.4757	0.5073	0.4757	0.5073
Adjusted R^2	0.2273	0.2580	0.2279	0.2581	0.2279	0.2582
3rd Quartile						
APTS	-0.0016 ***	-0.0016 **	-0.0028 ***	-0.0012		
	(0.0004)	(0.0007)	(0.0010)	(0.0018)		
$APTS^2$			0.0003	-0.0001		
			(0.0003)	(0.0005)		
LogAPTS					-0.0035 ***	-0.0035 **
					(0.0008)	(0.0015)
Observations	7,498	7,498	7,498	7,498	7,498	7,498
DV Interquartile Mean	0.3440	0.2702	0.3440	0.2702	0.3440	0.2702
Adjusted R^2	0.2807	0.4126	0.3243	0.4126	0.3243	0.4127

This table presents results for cross-sectional regressions of auditor provided tax services on tax avoidance. Columns 1, 3 and 5 (2, 4, and 6) use GAAPETR (CASHETR) as the dependent variable. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR and CASHETR, which are winsorized at 0 and 1. Standard errors are robust to heteroscedasticity and clustered at the client level. Variables are defined in Appendix A.

TABLE 6 (continued)

Regression Results Using One-Year GAAPETR and CASHETR Under Different Functional Forms at each Quartile

	Linear		Quadratic		Logarithmic	
	GAAPETR	**CASHETR**	**GAAPETR**	**CASHETR**	**GAAPETR**	**CASHETR**
Variables	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)
2nd Quartile						
APTS	-0.0039 ***	-0.0010	-0.0083 ***	0.0033		
	(0.0006)	(0.0008)	(0.0018)	(0.0021)		
$APTS^2$			0.0012 ***	-0.0012 **		
			(0.0004)	(0.0005)		
LogAPTS					-0.0096 ***	-0.0012
					(0.0014)	(0.0018)
Observations	7,495	7,495	7,495	7,495	7,495	7,495
DV Interquartile Mean	0.2581	0.1375	0.2581	0.1375	0.2581	0.1375
Adjusted R^2	0.2541	0.2808	0.2547	0.2812	0.2547	0.2807
1st Quartile						
APTS	0.0023 **	-0.0006	0.0086 **	0.0000		
	(0.0012)	(0.0005)	(0.0041)	(0.0016)		
$APTS^2$			-0.0017 *	-0.0002		
			(0.0010)	(0.0004)		
LogAPTS					0.0066 **	-0.0010
					(0.0029)	(0.0013)
Observations	7,503	7,503	7,503	7,503	7,503	7,503
DV Interquartile Mean	0.0469	0.0184	0.0469	0.0184	0.0469	0.0184
Adjusted R^2	0.1288	0.1937	0.1292	0.1936	0.1291	0.1937
Control Variables	Included	Included	Included	Included	Included	Included
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

This table presents results for cross-sectional regressions of auditor provided tax services on tax avoidance. Columns 1, 3 and 5 (2, 4, and 6) use GAAPETR (CASHETR) as the dependent variable. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR and CASHETR, which are winsorized at 0 and 1. Standard errors are robust to heteroscedasticity and clustered at the client level. Variables are defined in Appendix A.

TABLE 7
Regression Results From Cross-sectional Tests of GAAPETR and CASHETR

	Time Trend		Economic Bonding		Large vs. Small Firms	
	GAAPETR	**CASHETR**	**GAAPETR**	**CASHETR**	**GAAPETR**	**CASHETR**
Variables	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)	Coefficient (std. errors)
LogAPTS	-0.0248 ***	-0.0163 *	-0.0673 ***	-0.0284 *	-0.0265	0.0312
	(0.0081)	(0.0095)	(0.0173)	(0.0166)	(0.0202)	(0.0215)
TIME	-0.0014 ***	0.0009				
	(0.0005)	(0.0006)				
LogAPTS x TIME	**-0.0023 *****	0.0002				
	(0.0008)	(0.0010)				
BONDING			0.0042	0.0068		
			(0.0037)	(0.0043)		
LogAPTS x BONDING			0.0208	0.0090		
			(0.0168)	(0.0161)		
LARGEFIRM					-0.0060	-0.0148 ***
					(0.0048)	(0.0055)
LogAPTS x LARGECLIENT					-0.0180	**-0.0488 ****
					(0.0199)	**(0.0214)**
NOAPTS	-0.0029	-0.0105 ***	-0.0005	-0.0067	(0.0021)	(0.0088) **
	(0.0034)	(0.0039)	(0.0039)	(0.0044)	(0.0035)	(0.0040)
ABACC	-0.0726 ***	-0.0199 ***	-0.0721 ***	-0.0193 **	(0.0726) ***	(0.0197) ***
	(0.0074)	(0.0076)	(0.0074)	(0.0076)	(0.0074)	(0.0076)
EQINC	-0.3440	-0.7970 **	-0.3260	-0.7780 **	(0.3490)	(0.8060) **
	(0.3190)	(0.3530)	(0.3200)	(0.3530)	(0.3190)	(0.3540)
FI	-0.1070 **	0.0753	-0.1050 **	0.0770	(0.1070) **	0.0725
	(0.0502)	(0.0560)	(0.0502)	(0.0561)	(0.0500)	(0.0557)
R&D	-0.3620 ***	-0.3170 ***	-0.3630 ***	-0.3180 *	(0.3630) ***	(0.3180) ***
	(0.0413)	(0.0437)	(0.0413)	(0.0438)	(0.0413)	(0.0436)
LEV	-0.0788 ***	-0.0978 ***	-0.0791 ***	-0.0974 *	(0.0789) ***	(0.0966) ***
	(0.0104)	(0.0120)	(0.0104)	(0.0120)	(0.0104)	(0.0120)
PPE	0.0033	-0.1130 ***	0.0031	-0.1140 *	0.0036	(0.1130) ***
	(0.0102)	(0.0119)	(0.0102)	(0.0119)	(0.0102)	(0.0119)
BTM	-0.0129 ***	0.0074	-0.0127 ***	0.0076	(0.0129) ***	0.0075
	(0.0046)	(0.0048)	(0.0047)	(0.0048)	(0.0046)	(0.0048)
NOL	-0.0226 ***	-0.0431 ***	-0.0225 ***	-0.0429 *	(0.0226) ***	(0.0431) ***
	(0.0029)	(0.0035)	(0.0029)	(0.0035)	(0.0029)	(0.0035)
ΔNOL	-0.0238	-0.0788 ***	-0.0236	-0.0788 *	(0.0232)	(0.0774) ***
	(0.0166)	(0.0152)	(0.0166)	(0.0152)	(0.0166)	(0.0151)
ROA	-0.1110 ***	-0.3470 ***	-0.1140 ***	-0.3500 *	(0.1080) ***	(0.3390) ***
	(0.0298)	(0.0294)	(0.0298)	(0.0294)	(0.0298)	(0.0292)
SIZE	0.0052 ***	0.0066 ***	0.0057 ***	0.0070 *	0.0067 ***	0.0101 ***
	(0.0010)	(0.0011)	(0.0010)	(0.0011)	(0.0014)	(0.0015)
CASH	-0.0303 ***	-0.0325 ***	-0.0306 ***	-0.0327 *	(0.0309) ***	(0.0335) ***
	(0.0084)	(0.0094)	(0.0084)	(0.0094)	(0.0084)	(0.0094)
DEP	-0.1670 **	0.4130 ***	-0.1670 **	0.4150 *	(0.1710) **	0.4090 ***
	(0.0702)	(0.0807)	(0.0701)	(0.0807)	(0.0703)	(0.0806)
Constant	0.2300 ***	0.2180 ***	0.2270 ***	0.2120 *	0.2260 ***	0.2040 ***
	(0.0534)	(0.0455)	(0.0532)	(0.0455)	(0.0529)	(0.0446)
Observations	29,988	29,988	29,988	29,988	29,988	29,988
Adjusted R^2	0.0686	0.0898	0.0685	0.0900	0.0685	0.0909
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES

This table presents results for cross-sectional regressions of auditor provided tax services on tax avoidance. Columns 1, 3 and 5 (2, 4, and 6) use GAAPETR (CASHETR) as the dependent variable. All continuous variables are winsorized (reset) at the 1st and 99th percentiles except for GAAPETR and CASHETR, which are winsorized at 0 and 1. Standard errors are robust to heteroscedasticity and clustered at the client level. Variables are defined in Appendix A.