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THE IMPLICATIONS OF PCAOB'S LIMITS ON AUDITOR-PROVIDED TAX SERVICES FOR CORPORATE GOVERNANCE, FINANCIAL REPORTING, AND TAXATION

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Abstract

Auditor-provided tax services (APTS) purchases by accounting firms to audit clients have been a subject of regulatory concern due to potential conflicts of interests and threats to auditor independence. The enactment of the Sarbanes-Oxley Act of 2002 (SOX) and subsequent regulatory actions have increased public scrutiny on APTS purchases and added restrictions on the types of NAS that accounting firms can provide to audit clients. The PCAOB released three rules to prohibit abusive practices within the US tax shelter industry, including prohibiting accounting firms from performing tax services on a contingent fee basis, providing assistance to clients in connection with aggressive tax transactions, and selling tax services to executives in a financial reporting role.

Research on the impacts of APTS on auditor independence has been extensive and mixed. While some studies suggest that NAS purchases impair auditor independence and lead to more aggressive tax strategies, others have found a positive association between APTS fees and the likelihood of correctly issuing a going-concern opinion among firms that have filed for bankruptcy. Additionally, APTS purchases have been found to improve internal control quality, provide more accurate tax reserves, and enhance audit effectiveness through knowledge spillover. This paper provides an overview of the regulatory actions and research on APTS purchases by accounting firms. It highlights the conflicting findings in the literature and emphasizes the need for future research to consider the specific contexts and characteristics of APTS purchases. The paper also calls for a regulatory approach that balances the potential benefits and risks of APTS while ensuring auditor independence and maintaining the trust of investors and stakeholders.

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INTRODUCTION

Concerns arise among regulators when an accounting firm provides non-audit services (NAS) to its audit clients as fee dependence could potentially jeopardize the long-standing professional requirement of auditor independence both in fact and in appearance. Shortly after the accounting scandals in the early 2000s, the Sarbanes-Oxley Act of 2002 (SOX) prohibited nine categories of NAS provided by an accounting firm to audit clients, but auditor-provided tax services (APTS) purchases were allowed as long as pre-approved by audit committees.[1] Later in 2003, the SEC prohibited accounting firms from representing audit clients in court on tax matters. These regulatory actions have added an unprecedented degree of public scrutiny that might have also affected managers' incentives on non-prohibited NAS purchases. For example, many companies dismissed their incumbent auditors as tax providers just to avoid scrutiny from investors, although these firms received the audit committees' approval to purchase tax services from the same auditors (Alsadoun et al., 2018).

In 2005, according to a report of the Permanent Subcommittee on Investigations of the U.S. Senate, accounting firms were discovered to have engaged in aggressive tax shelter schemes (e.g., the KPMG tax shelter fraud scandal) and involved in selling personal tax services to top executives who play a direct role in preparing the financial statements of audit clients. Moreover, such aggressive tax services were sold on a contingent fee basis although contingent fees are strictly prohibited under Rule 302 of the AICPA's Code of Professional Conduct.

Consequently, the PCAOB released three restrictions to prohibit U.S. public accounting firms from (1) performing tax services on a contingent fee basis (Rule 3521); (2) providing assistance to a client in connection with confidential or aggressive tax transactions (Rule 3522); and (3) selling tax services to executives in a financial reporting role (Rule 3523). These rules became effective since October 31, 2006, representing a renewed effort to rein in abusive practices within the U.S. tax shelter industry (PCAOB, 2005).

Concerns about the impact of NAS on auditor independence have induced extensive research over the last three decades. On the one hand, NAS make accounting firms financially dependent on audit clients which could compromise objectivity and affect audit quality. Some studies find that NAS purchases impair auditor independence and are associated with small earnings surprises (Frankel et al., 2002), lower earnings responsive coefficients (ERC) (Krishnan et al., 2005; Francis & Ke, 2006), and more aggressive tax avoidance strategies (Cook et al., 2008; Dhaliwal et al., 2013; Hogan & Noga, 2015; and Cook et al., 2020).

On the other hand, the joint work of audit and tax services creates synergy that accounting firm can gather information about clients through NAS and further enhance audit effectiveness facilitated through knowledge spillover. Prior research finds a negative association between APTS purchases and accounting restatement (Kinney et al., 2004), tax-related restatements (Seetharaman et al., 2011), but a significant positive relation between APTS fees and the likelihood of correctly issuing a going-concern opinion among a sample of firms that have filed for bankruptcy (Robinson, 2008). APTS purchases also help companies with more accurately estimated tax reserves (Gleason & Mills, 2011) and improves internal control quality by accelerating audit firm's awareness of transactions material to financial statements (De Simone et al., 2015).

In spite of the mixed results from extant literature regarding the impact of NAS on auditor independence, I argue that the intentions of the restrictions on NAS provision imposed by the SOX and the
PCAOB are different. The SOX left the decision of APTS purchases to audit committees and made them
"the watchdogs" of auditor independence to pre-approve non-prohibited NAS. In contrast, the PCAOB regulation explicitly prohibits auditors from providing three aggressive tax transactions and services. This study examines whether the PCAOB's restrictions on APTS purchases in 2005 can curtail the potential negative impact of APTS on companies' audit quality, earnings quality, and tax avoidance activities than the SOX rules that left the purchase decision to the audit committee. I also examine whether such impact is more pronounced when there is more effective audit committee oversight.

Using the difference-in-differences research design, the treatment group consists of companies that purchased pre-approved APTS but were likely to have engaged in the now-prohibited aggressive tax avoidance activities. These firms are the most affected by the PCAOB restrictions. Control group represents companies that purchased

pre-approved APTS but are not affected by the PCAOB restrictions. If the PCAOB's restrictions on APTS purchases achieve the regulators' intended purpose to improve auditor independence, I would observe improved audit and earnings quality and lower tax aggressiveness among the treatment firms, particularly for firms with more effective audit committees. The results indicate that the PCAOB restrictions reduce subsequent financial restatements, increase discretionary permanent booktax differences, but have very little impact on earnings quality and other tax avoidance measures. In addition, I find that the treatment firms with more effective audit committee oversight are less likely to meet or beat earnings targets and have smaller discretionary permanent book-tax differences following the PCAOB's restrictions. The latter finding supports the notion that effective audit committee oversight plays an important role in alleviating negative impact of APTS on auditor independence.

This study extends Lennox (2016) in several ways. Firstly, in addition to Lennox's focus on the PCAOB's restrictions on APTS, this study explores two coherent regulations on non-audit services, the SOX and the PCAOB's restrictions, that both address to auditor independence concern while the PCAOB's restrictions place stricter provisions on APTS. Secondly, this study extends and explores the impact of the PCAOB's restrictions on tax aggressiveness, measured by book and cash effective tax rates as well as discretionary permanent book-tax differences. I believe that a comprehensive investigation on direct consequences after the PCAOB's rules helps evaluate the effect of APTS purchases on firms' financial reporting quality and tax avoidance strategies. Lastly, the sample selection is different from Lennox (2016). The treatment firms of this study are firms purchased APTS in the SOX regulation period[2] but significantly reduced tax fees (i.e., at least 75% reduction) around the time when PCAOB's restrictions became effective. The control firms are firms that retain APTS purchases both after the SOX regulation and the PCAOB's restrictions.[3] I believe that this sample selection captures firms that were likely to have engaged in the nowprohibited aggressive tax avoidance that the PCAOB restrictions targeted on.

This study contributes to the literature threefold. First, I examine the effectiveness of regulations imposed on NAS, including APTS, to alleviate the concern about auditor independence impairment. I extend prior studies on the impact of PCAOB's restrictions on the audit quality by investigating companies that retained pre-approved APTS purchases after the SOX but significantly reduced tax fees following the PCAOB regulation. More importantly, I examine whether the rules imposed by the PCAOB can curtail the potential negative effect of APTS purchases on companies' audit quality, earnings quality, and tax avoidance activities, as compared to the SOX. Second, this study extends the prior studies' focus on the association between APTS and audit quality or tax avoidance. This study provides more comprehensive empirical analyses to evaluate the effectiveness of the PCAOB's restrictions on audit and earnings quality and capture the more aggressive end of the tax-avoidance spectrum. I find that the PCAOB's restrictions on APTS purchases reduce the likelihood of subsequent financial restatements and increase discretionary permanent book-tax differences but have very little impact on earnings quality. Finally, it also contributes to the literature examining the audit committee effectiveness. I find more effective audit committees improve earnings quality and lower the discretionary permanent book-tax differences following the PCAOB's restrictions on APTS purchases. The results should be of interest to U.S. accounting and audit regulators such as the SEC and PCAOB, public accounting firms, auditors, corporate audit committees.

The rest of the paper is organized as follows. Section 2 summarizes prior research in NAS, including tax services, and develops the testable hypotheses. Section 3 provides details of research design and describes sample selection and data. Section 4 provides empirical evidence. Section 5 presents supplementary analyses. The final section concludes.

PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

Non-Audit Services and Auditor Independence

The relationship between NAS and auditor independence is a controversial issue that has induced extensive research over the last three decades. On the one hand, regulators concern about the potential conflicts of interest where NAS make accounting firms financially dependent on audit clients which could compromise objectivity and impair auditor independence that leads to poor audit quality (Simunic, 1984; and Francis, 2006). Many studies provide evidence supporting the conflict-of-interest theory that NAS impair auditor independence and result in

lower audit and earnings quality. For example, Frankel et al. (2002) find that NAS fees are positively associated with small earnings surprises and abnormal accruals, indicating that auditors are more likely to go along with clients' opportunistic decision when NAS fees increase. Using UK data, Ferguson et al. (2004) provide evidence indicating that earnings management is positively associated with NAS purchases. Prior research also finds that NAS could affect investors' perception about earnings informativeness. For instance, Krishnan et al. (2005) find that NAS fees are negatively associated with earnings responsive coefficients (ERC). Similarly, Francis and Ke (2006) find significant lower ERC for U.S. firms with a higher level of NAS purchases. A recent study by Carr et al. (2019) find that the audit quality is significantly improved after the restrictions on APTS but the result stems primarily from companies potentially targeted by the PCAOB on aggressive tax services.

On the other hand, the joint work of audit and tax services creates synergy whereby accounting firm can obtain information about clients through NAS and further enhance audit effectiveness facilitated through knowledge spillover. Prior research has provided evidence in support of the knowledge spillover. For example, Simunic (1984) find that audit fees are positively associated with NAS, indicating this fee increase is arising from a beneficial knowledge spillover where auditors make extra efforts when they also provide NAS. Kinney et al. (2004) find a negative association between APTS fees and accounting restatement. Antle et al. (2006) find that NAS fees are negatively associated with abnormal accruals. Similarly, Seetharaman et al. (2011) find a negative association between APTS and tax-related restatements. Consistent with improved audit quality from information spillover, Robinson (2008) documents a significant positive relation between APTS fees and the likelihood of correctly issuing a going concern opinion among a sample of firms that have filed for bankruptcy. Lassila et al. (2010) examine the factors that influence public companies' decision to retain or dismiss APTS. They find that firms with strong corporate governance are more likely to retain APTS. Gleason and Mills (2011) also find that companies with APTS purchases are fully reserved for IRS disputes and can more accurately estimate tax reserves. In addition, De Simone et al. (2015) finds that APTS improves internal control quality by accelerating audit firm's awareness of transactions material to financial statements.

Studies also provide evidence indicating that NAS may not affect auditor independence at all. DeFond et al. (2002) and Craswell et al. (2002) find no significant association between NAS fees and going-concern opinions after the SOX. Ashbaugh et al. (2003) report insignificant association between firms meeting analyst forecasts and NAS fees. In sum, studies provide mixed evidence on the impact of NAS including

APTS purchases on auditor independence, and on companies' audit quality and earnings quality.

Several studies also provide evidence that APTS purchases are associated with long-term tax avoidance strategies. For example, Cook et al. (2008) find that higher APTS fees are associated with a greater reduction in the book ETRs between the 3rd and the 4th quarters for firms that would miss analysts' forecasts in the absence of ETR change. Dhaliwal et al. (2013) document a positive relationship between tax NAS fees and tax avoidance. Similarly, Hogan and Noga (2015) find a positive relationship between APTS purchases and long-term tax avoidance. Cook et al. (2020) find that the voluntary dismissal or substantial reduction in APTS purchase is positively associated with the book (cash) ETRs and negatively associated with discretionary permanent book-tax differences, indicating significant tax costs on firms who made such decisions.

Lennox (2016) examines how the PCAOB restrictions on APTS purchases affect audit quality and finds no significant association between PCAOB restrictions and general restatements, tax-related statements, and going concern opinion. A recent study by Carr et al. (2021) finds that companies that engaged in aggressive tax avoidance before the PCAOB's restrictions experienced an improvement in the overall quality of the income tax accrual and increased their financial reporting reserves for uncertain income tax positions. Although prior literature provides rather consistent evidence on the positive association between NAS and tax avoidance, the evidence about the effect of PCAOB's restriction on tax avoidance activities is scarce.

Different from previous studies, this study examines whether the PCAOB's restrictions can curtail the potential negative impact of APTS on companies' audit quality, earnings quality, and tax avoidance activities, as compared to the SOX rules. If the audit committees' pre-approvals and the PCAOB's provisions are both effective to curtail

the negative impact of APTS purchases, I predict that there is no incremental effect of PCAOB restrictions on companies' audit quality, earnings quality, and tax avoidance activities. Hence, I develop a first set of hypotheses as follows (stated in the null form).

H1a: *PCAOB's restrictions on APTS purchases are not associated with firms' audit quality.*

H1b: *PCAOB's restrictions on APTS purchases are not associated with firms' earnings quality.*

H1c: *PCAOB's restrictions on APTS purchases are not associated with firms' tax avoidance.*

Non-Audit Services and Audit Committee

Prior research has examined the oversight role that the audit committees play in financial reporting process. For example, larger audit committees are more likely to be acknowledged as an authoritative body by the external and internal audit function (Kalbers & Fogarty, 1993). Abbott et al. (2004) find that audit committees with more independent members and financial experts are associated with fewer financial restatements. Dhaliwal et al. (2010) show that audit committees with accounting experts who are independent, hold fewer directorships, and have a lower tenure are associated with higher accruals quality. Further, Badolato et al. (2014) find that the presence of both financial expertise and high relative status are associated with a lower level of earnings management, as measured by accounting irregularities and abnormal accruals. Similarly, Dhaliwal et al. (2013) find a positive association between tax planning fees and firm valuation is more pronounced when firms have accounting experts sitting on the audit committee to oversee tax services. Lisic (2014) documents that APTS purchases are associated with less earnings management through tax expense when pre-approved by more effective audit committees. Bédard and Paquette (2021) find tax NAS are significantly lower when accounting financial experts serve on the audit committee. Many studies also find financial experts on the audit committees influence tax planning. For example, Robinson et al. (2012) report audit committees with more accounting experts are associated with a higher level of tax planning but a lower likelihood of engaging in risky tax planning. However, financial experts encourage more (less) tax avoidance in high risk-aversion (risk seeking) firms (Hsu et al., 2018).

I therefore predict that more effective audit committees should curtail the potential negative impact of APTS purchases on companies' audit quality, earnings quality, and aggressive tax avoidance activities. Since no study has examined whether more effective audit committees would help PCAOB's restrictions further curtail the potential negative impact of APTS purchases, I develop a second set of hypotheses as follows (stated in the null form).

H2a: *Audit committee effectiveness is not associated with audit quality following the PCAOB's restrictions on APTS purchases.*

H2b: *Audit committee effectiveness is not associated with earnings quality following the PCAOB's restrictions on APTS purchases.*

H2c: *Audit committee effectiveness is not associated with tax avoidance following the PCAOB's restrictions on APTS purchases.*

The following section discusses the models used to test the above hypotheses.

RESEARCH DESIGN AND SAMPLE SELECTION

Research Design

This study focuses on firms that pre-approved APTS purchases after the SOX but significantly reduced APTS purchases under the PCAOB's restrictions. I define the treatment group as companies who retained APTS purchases in the SOX regulation period but reduced APTS purchases significantly (i.e., tax fees dropped by at least 75%) during the time when the PCAOB's restrictions became effective.[4] I believe that this sample selection can better capture affected firms that were likely to have engaged in the nowprohibited aggressive tax avoidance activities before the PCAOB rules were introduced. Control group consists of companies that retained APTS purchases in both the SOX and the PCAOB periods as I assume that the control firms have never engaged in the prohibited aggressive tax avoidance, and therefore, will not be affected by the PCAOB restrictions. In a robustness test, I alter control firms as companies never purchase APTS during the sample period and find consistent results.

I use the following regression models to test the first set of hypotheses.

$$AQ_{it} = \sum a_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 POST_i * TREAT_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (1a)$$

$$EQit = \sum ai\ Fi + \beta 1 TREATi + \beta 2 POSTi + \beta 3 POSTi * TREATi + \sum \mu it\ Controlit + \varepsilon it \quad (1b)$$

$$TAit = \sum ai\ Fi + \beta 1 TREATi + \beta 2 POSTi + \beta 3 POSTi * TREATi + \sum \mu it\ Controlit + \varepsilon it \quad (1c)$$

The audit quality (AQ_{it}) in both equations is measured by general restatements ($Restatements_{it}$).[5] $Restatements_{it}$ equals 1 if company *i*'s audited financial statements in year *t* are subsequently restated due to misstatements, and 0 otherwise. Restatements have been widely used in the literature (e.g., Seetharaman et al., 2011; Hennes et al., 2014; Lennox & Li, 2014; and Lennox, 2016) as a proxy for audit quality because auditors are directly responsible for financial misstatements. There is normally a time lag between the occurrences of financial misstatements and subsequent restatements. This study assumes that restatements occurring between July 30, 2002 and July 25, 2005 are related to the misstated financial statements in the SOX period. Similarly, restatements after July 26, 2005 are related to the misstatements in the PCAOB regulation period.

$TREAT_i$ equals 1 if company *i* retained APTS purchases under the SOX rules but significantly reduced tax fees by at least 75 percent under the PCAOB rules, and 0 otherwise.[6] $POST_i$ equals 1 if the test period falls within the PCAOB regulation period, and 0 otherwise. Each firm is required to have three consecutive reporting years since the year it significantly reduced tax fees. For example, if the company's first reporting year of tax fee reduction ended on October 31, 2006, then POST indicates the period between October 31, 2006 and October 31, 2009. The interaction term $POST_i * TREAT_i$ captures the effect of the PCAOB rules on audit quality. I expect a negative coefficient on $POST_i * TREAT_i$ if the PCAOB rules reduce subsequent financial restatements.

Earnings quality (EQ_{it}) is measured by meeting or beating earnings targets: prior earnings ($Prior\_Earnings_{it}$) and small positive earnings ($Small\_Positive_{it}$), and discretionary accruals ($DACC_{it}$). $Small\_Positive_{it}$ equals 1 if company *i*'s earnings per share in year *t* meet or beat zero earnings within 5 cents, and 0 otherwise. $Prior\_Earnings_{it}$ equals to 1 if company *i*'s earnings in year *t* meet or beat earnings in year *t-1*, and 0 otherwise. $DACC_{it}$ and $DACC_{i(t-1)}$ represent performance-matched discretionary accruals for company *i* in year *t* (*t-1*) that are measured by the modified Jones model and performance matching is based on Kothari et al. (2005). If the PCAOB rules increase earnings quality, I would expect to observe a negative coefficient on $POST_i * TREAT_i$ when *EQ* is measured by $Prior\_Earnings_{it}$, $Small\_Positive_{it}$, $DACC_{it}$.

I first use both book and cash ETRs as indicators for tax avoidance (Cook et al., 2008; and Dyreng et al., 2008). $Book\_ETR_{it}$ is defined as total income tax expense less deferred taxes divided by pre-tax income in year *t*. $Cash\_ETR_{it}$ is the cash taxes paid divided by pre-tax book income less special items in year *t*. I winsorize *Book_ETR* and *Cash_ETR* at 0 and 1. Following Omer et al. (2006), if firms are less likely to engage in tax avoidance after the PCAOB rules, I would expect to observe a positive coefficient on $POST_i * TREAT_i$ when using $Book\_ETR_{it}$ and $Cash\_ETR_{it}$. However, tax avoidance can be representing a spectrum, from innocuous tax planning activities to extremely aggressive activities and tax sheltering to the other end (Hanlon & Heitzman, 2010; Wilde & Wilson, 2018; and Cook et al., 2020). Given that three PCAOB rules specifically target aggressive tax transactions, the use of book and cash ETRs, which measure overall tax avoidance, may fail to capture tax aggressiveness. Therefore, to alleviate the concern that using overall measures of tax avoidance may bias against the ability to identify changes in tax avoidance stemming from decreases in auditor-provided tax services, I follow prior tax aggressiveness and tax sheltering literature to use discretionary permanent book-tax differences ($DTAX_{it}$) to capture the more aggressive end of the tax-avoidance spectrum (Frank et al., 2009; Wilson, 2009; and Guenther et al., 2017).[7] I expect to observe a negative coefficient, i.e., β_3 in Equation (1a) and (1b), if PCAOB's restrictions improve firms' audit quality and earnings quality. I expect to observe a positive coefficient, i.e., β_3 in Equation (1c) and a negative coefficient for *DTAX* if PCAOB's restrictions help further reduce tax avoidance activities. I use the following regression models to test the second set of the audit committee hypotheses.

$$AQit = \sum ai\ Fi + \beta 1TREATi + \beta 2POSTi + \beta 3ACi + \beta 4POSTi*TREATi + \beta 5TREATi*ACi + \beta 6POSTi*ACi + \beta 7\ POSTi*TREATi*ACi + \sum \mu it\ Controlit + \mathcal{E}i \quad (2a)$$

$$EQ_{it} = \sum a_i\ F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 AC_i + \beta_4 POST_i*TREAT_i + \beta_5 TREAT_i*AC_i + \beta_6 POST_i*AC_i + \beta_7\ POST_i*TREAT_i*AC_i + \sum \mu_{it}\ Control_{it} + \varepsilon_{it} \quad (2b)$$

$$TAit = \sum ai\ Fi + \beta 1TREATi + \beta 2POSTi + \beta 3ACi + \beta 4POSTi*TREATi + \beta 5TREATi*ACi + \beta 6POSTi*ACi + \beta 7\ POSTi*TREATi*ACi + \sum \mu it\ Controlit + \mathcal{E}it \quad (2c)$$

To measure the audit committee effectiveness (AC_{it}) in Equation (2), I follow Lisic (2014) and use the sum of six commonly used dichotomous measures of audit committee characteristics (AC_{it}) for company *i* in year *t* and, including committee size, committee meeting frequency, chair with management expertise, the financial experts' proportion, the average number of other board positions, and the average board tenure. Audit committee effectiveness of each firm-year observation is then ranged from the lowest 0 to the highest of 6. These measures are widely used in the extant literature audit committee characteristics (e.g., Abbott et al., 2004; Dhaliwal et al., 2010; Robinson et al., 2012; Dhaliwal et al., 2013; Badolato et al., 2014; Lisic, 2014; and Hsu et al., 2018). Due to lack of available data on committee meeting frequency as Lisic (2014) used hand-collected audit committee data, I substitute this measure with the number of independent committee members. The descriptive statistics on AC_{it} are consistent with Lisic (2014) and other studies using the audit committee composite measure. The three-way interaction, $POST_i*TREAT_i*AC_i$, captures how the audit committee effectiveness impact on firms' audit and accounting quality and tax avoidance after PCAOB's restrictions. I expect to observe a negative coefficient, i.e., β_7 in Equation (2a) and (2b), if more effective audit committee indeed improves firms' audit and earnings quality. I also expect to observe a positive coefficient, i.e., β_3 in Equation (1c), and a negative coefficient for *DTAX* if PCAOB's restrictions help further reduce tax avoidance activities.

Prior research shows that earnings and audit quality along with tax avoidance are associated with certain company characteristics, such as company size, financial performance, and financial stress (e.g., DeFond & Zhang, 2014). Therefore, I control for the R&D expense (RD_{it}), foreign income (FI_{it}), property, plant and equipment ($NPPE_{it}$), cash and short-term Investments ($CASH_{it}$), depreciation and amortization expense (DEP_{it}), the natural logarithm of total assets ($LNTA_{it}$), return on assets (ROA_{it}), book-to-market ratio (BTM_{it}), and leverage (LEV_{it}). Following Lassila, Omer, Shelley, and Smith (2010) and Lennox (2016), I include a dummy variable for auditor size ($BIG4_{it}$), which equals 1 if company *i* is audited by a Big 4 accounting firm in year *t* and 0 otherwise. I also control for non-audit services other than tax ($OtherNAS_{it}$) because prior research shows that *OtherNAS* is correlated with tax fees. The definitions of all variables are included in Appendix.

Sample Selection

I refer to the SOX regulation period as the pre-period in the difference-in-differences analysis, which falls between July 30, 2002 and July 25, 2005. The PCAOB regulation period that falls between July 26, 2005 and October 31, 2007 is referred to as the post-period.[8] Table 1 Panel A summarizes the sample selection. I begin with 94,174 observations (19,598 firms) with tax fee data available from Audit Analytics during both periods. I exclude 42,061 observations (9,984 firms) that did not purchase APTS during sample periods or did not reduce APTS purchases by at least 75% in the PCAOB period. Next, I delete 34,022 observations (5,889 firms) with missing audit and financial data. Finally, as firms must exist in both test periods in order to use the difference-in-differences method, I further eliminate 6,240 observations (1,581 firms) that are not available in both test periods. The primary sample consists of 2,144 firms and 11,851 observations. I have 1,885 firms and 9,506 observations remained in the sample after deleting firms without audit committee characteristics data.

Panel B shows that the original sample contains 672 treatment firms and 3,661 observations and 1,472 control firms and 8,190 observations. Among these observations, 1,767 and 1,894 treatment observations are from the SOX and the PCAOB period, respectively, while 4,018 and 4,172 control observations are from the SOX and PCAOB period, respectively.[9] Untabulated results show that around 60.1% of the treatment firms (404 firms) reduced APTS purchases (at least 75% during the PCAOB period) in 2005, 34.5% (232 firms) in 2006, and 5.4%

(36 firm) in 2007, indicating that most firms reduced APTS purchases soon after the PCAOB's restrictions were first introduced in 2005.

To mitigate non-random selection bias and avoid endogeneity concern, I match each treatment firm to a control firm based on the closest propensity score derived from a separate probit model where $TREAT_i$ is the dependent variable and the independent variables contain RD_{it}, FI_{it}, $NPPE_{it}$, $CASH_{it}$, DEP_{it}, $LNTA_{it}$, $OtherNAS_{it}$, $BIG4_{it}$, ROA_{it}, BTM_{it}, and LEV_{it}.[10] The control sample using the PSM method consists of 484 firms and 3,694 observations with 1,802 and 1,892 observations from the SOX and PCAOB period, respectively. After deleting firms without audit committee characteristic data, the PSM sample consists of 590 (416) treatment (control) firms and 2,917 (2,763) treatment (control) observations. Among these observations, 1,290 (1,226) treatment (control) observations and 1,627 (1,537) treatment (control) observations are from the SOX and PCAOB period, respectively.

TABLE 1 SAMPLE SELECTION AND DISTRIBUTION

Panel A: Sample Selection			
		Firms	N
Firms with fees data in regulation periods:		19,598	94,174
Less: Firms that are not in Treat or Control groups		(9,984)	(42,061)
Less: Firms with missing financial data		(5,889)	(34,022)
Less: Firms with less than two consecutive pre and post data	(6,240)		(1,581)
Primary sample used to estimate Equation (1)		2,144	11,851
Less: Firms with missing audit committee data		(259)	(2,345)
Audit committee data used to estimate Equation (2)		1,885	9,506

Data Source: AuditAnalytics, Compustat, & BoardEx.

Panel B: Sample Distribution

	PRE	POST	N	Firms	Percent
TREAT	1,767	1,894	3,661	672	30.9%
CONTROL	4,018	4,172	8,190	1,472	69.1%
Total	5,785	6,066	11,851	2,144	100.0%

	PRE	POST	N	Firms	Percent
TREAT	1,767	1,894	3,661	672	49.8%
PSM_CONTROL	1,802	1,892	3,694	484	50.2%
Total	3,569	3,786	7,355	1,156	100.0%

	PRE	POST	N	Firms	Percent
AC_TREAT	1,290	1,627	2,917	590	30.7%
AC_CONTROL	2,994	3,595	6,589	1,295	69.3%
Total	4,783	5,222	9,506	1,885	100.0%

	PRE	POST	N	Firms	Percent
AC_TREAT	1,290	1,627	2,917	590	50.1%
AC_PSM_CONTROL	1,226	1,537	2,763	416	49.9%
Total	2,516	3,164	5,680	1,006	100.0%

EMPIRICAL RESULTS

Descriptive Statistics

Panel A of Table 2 reports the mean differences of variables between the treatment and control firm groups. Compared to the matched control firms, the treatment firms tend to have more financial restatements (0.16 vs. 0.12), higher discretionary accruals, lower ETRs, and higher discretionary permanent book-tax differences. Panel B also shows that the treatment firms are less likely to use Big4 auditors and report higher NPPE, ROA, and BTM. These results again need to be interpreted with caution because the mean differences as reported are the average mean differences in both pre and post periods.

TABLE 2 MEAN DIFFERENCES TESTS AND CORRELATION MATRICES

Panel A: Mean Differences Tests

Variable	N	(1) Full Sample	(2) Treatment	(3) Control	(4) PSM Control	(2) - (3) *Difference*	(2) - (4) *Difference*
Restatements	11,851	0.13	0.16	0.13	0.12	0.03 ***	0.04 ***
Book_ETR	11,851	0.22	0.21	0.23	0.22	-0.02 ***	-0.01 *
Cash_ETR	11,851	0.20	0.19	0.20	0.20	-0.01 **	-0.01 *
DTAX	11,851	0.03	-0.02	0.06	0.03	-0.08 ***	-0.05
AC	9,506	2.23	2.07	2.30	2.20	-0.23 ***	-0.13 ***
RD	11,851	0.05	0.06	0.05	0.07	0.01 **	-0.01
FI	11,851	0.01	0.01	0.01	0.01	0.00	0.00
NPPE	11,851	0.25	0.25	0.25	0.24	0.00	0.01 *
CASH	11,851	0.18	0.19	0.18	0.19	0.01 **	0.00
DEP	11,851	0.05	0.05	0.04	0.05	0.01 ***	0.00
LNTA	11,851	6.19	5.89	6.33	5.86	-0.44 ***	0.03
OtherNAS	11,851	0.18	0.17	0.18	0.18	-0.01	-0.01
BIG4	11,851	0.80	0.76	0.82	0.81	-0.06 ***	-0.05 ***
ROA	11,851	-0.02	-0.04	-0.01	-0.06	-0.03 ***	0.02 **
BTM	11,851	0.47	0.47	0.47	0.43	0.00	0.04 **
LEV	11,851	0.52	0.53	0.52	0.54	0.01	-0.01

, **, and * indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables, winsorized at the 1 and 99 percent levels where appropriate, are defined in the Appendix.*

Panel B: Correlation Matrices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) *Restatements*		**-0.055**	**-0.024**	**-0.035**	**-0.028**	**-0.033**	**-0.047**	0.002	**-0.026**	0.016	**-0.052**	-0.007	0.002	**-0.100**	**0.064**	**0.027**
(2) *Total_ETR*	**-0.039**		**0.574**	**0.045**	**0.111**	**-0.133**	**-0.150**	0.006	**-0.038**	**-0.084**	**-0.114**	0.011	**0.080**	**0.403**	**-0.097**	**-0.097**
(3) *Cash_ETR*	0.000	**0.436**		0.004	**0.134**	**-0.176**	**-0.133**	**0.073**	**-0.105**	**-0.043**	**-0.155**	0.004	**-0.085**	**0.337**	**-0.028**	**-0.037**
(4) *DTAX*	**-0.029**	0.021	0.012		**-0.035**	**0.066**	**-0.135**	0.017	0.009	0.020	**-0.212**	**-0.078**	**-0.093**	**-0.180**	**0.092**	**-0.047**
(5) *AC_SCORE*	**-0.027**	**0.089**	**0.090**	**0.042**		**-0.047**	**-0.128**	**0.081**	**-0.076**	**-0.031**	**-0.281**	**-0.027**	**-0.112**	**-0.113**	**0.031**	**-0.097**
(6) *RD*	**-0.033**	**-0.142**	**-0.154**	0.007	**-0.079**		**-0.201**	**-0.449**	0.002	**-0.172**	**-0.097**	**-0.032**	**-0.067**	**-0.165**	**-0.286**	

(7)	*FI*	**-0.039**	**0.106**	**0.048**	**0.104**	**0.090**	0.006	**-0.087**	**0.073**	**-0.053**	**0.263**	0.018	**-0.122**	**0.147**	**0.270**	-0.009	
(8)	*NPPE*	-0.005	**-0.044**	**0.025**	0.007	**0.067**	**-0.294**	**-0.076**	**-0.457**	**0.543**	**0.271**	**0.050**	**0.114**	0.008	**0.071**	**0.277**	
(9)	*CASH*	**-0.031**	**-0.073**	**-0.107**	0.001	**-0.101**	**0.486**	0.019	**-0.420**	**-0.131**	**0.268**	**0.073**	**0.060**	**-0.091**	**-0.218**	**-0.475**	
(10)	*DEP*	0.008	**-0.083**	**-0.037**	**-0.001**	**0.065**	**-0.061**	**0.071**	**-0.315**	**-0.095**	0.002	0.001	**0.063**	**-0.106**	**-0.021**	**0.076**	
(11)	*LNTA*	**-0.051**	**0.106**	**0.098**	**0.122**	**0.279**	**-0.224**	**0.198**	**0.251**	**-0.288**	**-0.058**	**0.195**	**0.456**	**0.117**	**-0.103**	**0.430**	
(12)	*OtherNAS*	**0.036**	0.006	-0.005	0.012	**-0.024**	**-0.022**	0.008	-0.013	**-0.041**	**0.048**	**0.089**	0.013	**-0.100**	**-0.125**		
(13)	*BIG4*	0.003	**0.070**	**0.048**	**0.027**	**0.112**	**-0.025**	**0.077**	**0.100**	**-0.064**	-0.005	**-0.472**	**0.024**	**0.082**	**-0.100**	**0.166**	
(14)	*ROA*	**-0.062**	**0.277**	**0.175**	**0.114**	**0.108**	**-0.357**	**0.324**	**0.048**	**-0.110**	**-0.259**	**0.202**	0.017	**0.108**	**-0.421**	**-0.239**	
(15)	*BTM*	**0.050**	0.016	**-0.030**	**-0.030**	-0.020	**-0.096**	**0.040**	**-0.075**	**0.097**	**-0.038**	**0.090**	0.011	**-0.094**	**-0.044**	**0.132**	
(16)	*LEV*	**0.023**	**-0.081**	-0.007	**0.068**	**-0.024**	**0.188**	**0.239**	**-0.049**	**0.407**	**0.077**	**0.354**	0.009	**0.150**	**-0.154**	**-0.303**	

Pearson (Spearman) Correlations are presented in the bottom (top) triangle. Variables are winsorized at the 1 and 99 percent levels where appropriate. All variables are defined in the Appendix. Bold coefficients are statistically significant at the 5 percent level.

Univariate Statistics

Table 3 reports the univariate difference-in-differences tests based on the PSM sample. I find that restatements significantly reduce for the treatment firms in the PCAOB period (-3.139, $p < 0.01$), indicating that the PCAOB restrictions on APTS purchases help improve auditing quality. I also find that the likelihood to meet or beat Small_Positive increases while both Cash_ETR and Book_ETR and the likelihood to meet or beat Prior_earnings decrease in the PCAOB period. The finding for earnings quality and tax avoidance is less clear cut because I find that measures for discretionary accruals and tax avoidance do not change in the PCAOB period. Overall, I find that PCAOB restrictions help improve audit quality but have no significant impact on earnings quality or tax avoidance using the univariate DID method.

TABLE 3 UNIVARIATE DID STATISTICS ON PSM

Restatements	PRE	POST	*Diff*		**DACCt-1**	PRE	POST	*Diff*	
TREAT	0.195	0.118	-0.076	***	TREAT	0.021	0.044	0.023	
CONTROL	0.135	0.109	-0.026	**	CONTROL	-0.120	-0.035	0.085	*
Diff	-0.059	-0.009	-3.139	***	*Diff*	-0.141	-0.079	-1.187	
	***					***	**		
Prior_Earnings	PRE	POST	*Diff*		**Book_ETR**	PRE	POST	*Diff*	
TREAT	0.648	0.576	-0.072	***	TREAT	0.205	0.216	0.010	
CONTROL	0.615	0.587	-0.028	*	CONTROL	0.209	0.238	0.029	***
Diff	-0.033	0.011	-1.944	*	*Diff*	0.004	0.022	-1.757	*
	**						***		
Small_Positive	PRE	POST	*Diff*		**Cash_ETR**	PRE	POST	*Diff*	

TREAT		0.024	0.023	-0.001		TREAT	0.177	0.197	0.021	***
CONTROL		0.031	0.017	-0.014	***	CONTROL	0.177	0.217	0.041	***
	Diff	0.007	-0.006	1.922	*	*Diff*	0.000	0.020	-1.944	*
								***		
DACC		PRE	POST	*Diff*		**DTAX**	PRE	POST	*Diff*	
TREAT		0.045	0.053	0.008		TREAT	2.293	-12.004	-14.298	*
CONTROL		-0.089	0.008	0.097	***	CONTROL	2.946	-2.840	-5.785	
Diff		-0.134	-0.045	-1.595		*Diff*	0.653	9.165	-0.757	
		***								

, **, and * indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Main Results

Table 4 reports the regression results for Equations (1). Panel A presents the multivariate logit regression results of restatements using the PSM sample. It shows a significant positive coefficient on *TREAT* (0.062, $p < 0.01$) and negative coefficients on *POST* (-0.026, $p < 0.05$). This suggests that the treatment firms are more likely to misstate their financial statements in the SOX period than the control firms and fewer financial statement restatements were reported in the PCAOB period. Importantly, I find that the coefficient of the interaction term *POST*TREAT* (-0.050, $p < 0.01$) is negative and significant, indicating that the PCAOB's restrictions on APTS purchases lead to fewer restatements. In Panel B the coefficients of the interaction *POST*TREAT* for *Small_Positive*, *Prior_earnings*, and *DACC* measures are mostly statistically insignificant, suggesting no significant change in earnings quality in the PCAOB period.

I then investigate whether the PCAOB rules mitigate tax avoidance, by measuring book and cash ETRs. Panel C shows that *POST* is positively associated with both *Book_ETR* and *Cash_ETR* (0.023 and 0.042, $p < 0.01$, respectively), indicating that the average tax rates increase in the PCAOB period. I find that the coefficient on the interaction *POST*TREAT of Cash_ETR* is negative and significant (-0.016, $p < 0.10$) while the interaction term *POST*TREAT of Book_ETR* is insignificant. These findings support previous argument that the use of book (cash) ETRs for overall tax avoidance do not provide clear-cut results and may fail to capture tax aggressiveness. However, I also find the coefficient on *POST*TREAT* is positive and significant of *DTAX* (0.233, $p < 0.10$), indicating greater aggressive tax planning activities in the treatment group during the PCAOB regulation period. Overall, I find PCAOB rules improve audit quality but have little impact on earnings quality and tax avoidance.

TABLE 4 IMPACT OF PCAOB'S RESTRICTIONS ON APTS

Panel A: Regression Tests of PCAOB's Restrictions on Restatements

$$AQ_{it} = \sum a_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 POST_i{*}TREAT_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (1a)$$

	Restatements	
Variables	Coef	t-Stat
TREAT	0.062***	(5.48)
POST	-0.026**	(-2.29)
*POST*TREAT*	-0.050***	(-3.16)
RD	-0.012	(-0.97)
FI	-0.009	(-0.11)
NPPE	-0.149***	(-5.30)
CASH	-0.126***	(-5.06)

DEP	-0.043	(-0.86)
LNTA	0.002	(0.94)
Other NAS	0.003	(0.45)
BIG4	0.017	(1.40)
ROA	-0.011	(-0.64)
BTM	0.016***	(2.67)
LEV	-0.000	(-0.03)
Constant	0.231***	(4.76)
Industry Fixed Effects	Yes	
N	7,355	
Pseudo R^2	0.071	

, **, and * indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Panel B: Regression Tests of PCAOB's Restrictions on Earnings Quality

$$EQ_{it} = \sum \alpha_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 POST_i{*}TREAT_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (1b)$$

Variables	Prior_Earnings	Small_Positive	DACC	DACCt-1
TREAT	0.018	-0.009*	0.109***	0.125***
	(1.09)	(-1.77)	(2.74)	(3.33)
POST	-0.045***	-0.014***	0.093**	0.079**
	(-2.88)	(-2.76)	(2.37)	(2.13)
*POST*TREAT*	-0.025	0.013*	-0.073	-0.058
	(-1.11)	(1.89)	(-1.32)	(-1.11)
RD	0.073***	0.014**	0.417***	0.095**
	(4.20)	(2.51)	(9.65)	(2.32)
FI	0.635***	-0.052	-0.751***	-0.428
	(5.64)	(-1.45)	(-2.69)	(-1.62)
NPPE	-0.076*	-0.006	0.142	-0.018
	(-1.92)	(-0.48)	(1.44)	(-0.19)
CASH	0.067*	-0.002	-0.057	-0.312***
	(1.91)	(-0.21)	(-0.66)	(-3.77)
DEP	0.241***	0.016	0.714***	-0.386**
	(3.41)	(0.73)	(4.08)	(-2.33)
LNTA	-0.006	-0.010***	0.004	0.000
	(-1.58)	(-8.43)	(0.50)	(0.04)
Other NAS	0.004	0.003	0.026	0.009
	(0.36)	(1.10)	(1.04)	(0.40)
BIG4	0.001	-0.016***	-0.022	-0.022
	(0.05)	(-3.00)	(-0.51)	(-0.56)
ROA	0.377***	0.068***	0.745***	0.329***

	(15.78)	(9.01)	(12.60)	(5.87)
BTM	-0.066***	0.002	0.058***	-0.011
	(-7.61)	(0.81)	(2.67)	(-0.54)
LEV	0.032	0.016**	0.073	-0.205***
	(1.33)	(2.16)	(1.24)	(-3.67)
Constant	0.670***	0.119***	-1.058***	-0.605***
	(9.80)	(5.47)	(-6.25)	(-3.77)
Industry Fixed Effects	Yes	Yes	Yes	Yes
N	7,355	7,355	7,355	7,355
R^2	0.075	0.038	0.055	0.042

*T-statistics in parentheses. *, **, and *** indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Panel C: Regression Tests of PCAOB's Restrictions on Tax Avoidance

$$TA_{it} = \sum \alpha_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 POST_i * TREAT_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (1c)$$

Variables	Book_ETR	Cash_ETR	DTAX
TREAT	-0.001	0.003	-0.102**
	(-0.21)	(0.43)	(-2.10)
POST	0.023***	0.042***	0.041
	(3.30)	(6.02)	(0.85)
*POST*TREAT*	-0.013	-0.016*	0.233***
	(-1.33)	(-1.68)	(3.46)
RD	0.029***	0.017**	0.313***
	(3.76)	(2.18)	(5.92)
FI	0.201***	0.015	-0.010
	(4.08)	(0.31)	(-0.03)
NPPE	-0.055***	0.012	-0.330***
	(-3.15)	(0.68)	(-2.69)
CASH	-0.086***	-0.077***	-0.237**
	(-5.61)	(-4.98)	(-2.22)
DEP	0.066**	0.044	2.413***
	(2.13)	(1.43)	(11.25)
LNTA	0.013***	0.009***	-0.007
	(8.43)	(5.64)	(-0.63)
Other NAS	-0.000	0.003	0.046
	(-0.06)	(0.78)	(1.50)
BIG4	0.009	0.023***	0.020
	(1.23)	(3.05)	(0.39)
ROA	0.098***	0.071***	0.721***

	(9.36)	(6.74)	(9.88)
BTM	-0.005	0.003	0.060**
	(-1.34)	(0.84)	(2.26)
LEV	-0.063***	-0.047***	0.037
	(-6.00)	(-4.46)	(0.52)
Constant	0.074**	0.017	0.329
	(2.46)	(0.55)	(1.59)
Industry Fixed Effects	Yes	Yes	Yes
N	7,355	7,355	7,332
R^2	0.150	0.117	0.100

*T-statistics in parentheses. *, **, and *** indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Next, I investigate whether effective audit committees, measured by the sum of six dichotomous audit committees' characteristics, help improve audit quality, earnings quality, and reduce tax avoidance following the PCAOB rules. Table 5 reports the regression results for Equations (2). Panel A shows that the interaction terms *TREAT*AC* and *POST*AC* are positive but not significant. Moreover, the coefficient of *POST*TREAT*AC* is negative but statistically insignificant for the PSM sample. Therefore, the composite measure of audit committee does not appear to improve audit quality. Panel B show that *TREAT* is generally not associated with meeting or beating earnings thresholds. However, the coefficients on 3-way interaction *POST*TREAT*AC* are negative and significant for *Prior_earnings* and *Small_Positive* (-0.052 and -0.023, $p < 0.10$ and <0.01, respectively). It indicates the treatment firms with more effective audit committee are less likely to meet or beat earnings thresholds following the PCAOB restrictions.

Panel C shows whether audit committee effectiveness influences the association between APTS purchases and tax avoidance following the PCAOB rules. The interaction *POST*TREAT* is positive and significant with *DTAX* (0.719, $p < 0.01$). *TREAT*AC* is positive and significant with *Book_ETR* and *DTAX* (0.023 and 0.111, $p < 0.05$ and< 0.10, respectively) and *POST*AC* is positive and statistically significant among three tax avoidance measures (0.023, 0.036, and 0.154, $p < 0.05$, < 0.01, and< 0.01, respectively). More importantly, the coefficients on 3-way interaction *POST*TREAT*AC* are negative and significant for *Cash_ETR* and *DTAX* while the interaction is negative but insignificant for *Book_ETR*.

Taken together with previous findings of the PCAOB's impact on tax avoidance, this result suggests that although the treatment firms appear to engage in greater aggressive tax planning activities in the PCAOB regulation period, the treatment firms with more effective audit committee oversight may respond to the more stringent PCAOB restrictions to a larger extent than less effective audit committees and further curtail aggressive tax planning.[11]

TABLE 5 AUDIT COMMITTEE EFFECTIVENESS

Panel A: Regression of AC Score on Restatements

$$AQ_{it} = \sum a_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 AC_i + \beta_4 POST_i{*}TREAT_i + \beta_5 TREAT_i{*}AC_i + \beta_6 POST_i{*}AC_i + \beta_7 POST_i{*}TREAT_i{*}AC_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (2a)$$

	Restatements	
Variables	Coef	t-Stat
TREAT	0.053	(1.09)
POST	-0.075	(-1.56)

AC	-0.001	(-0.06)
*POST*TREAT*	-0.004	(-0.06)
*TREAT*AC*	0.003	(0.15)
*POST*AC*	0.013	(0.80)
*POST*TREAT *AC*	-0.017	(-0.74)
RD	-0.203**	(-2.38)
FI	0.062	(0.50)
NPPE	-0.119***	(-2.91)
CASH	-0.079**	(-2.30)
DEP	-0.122	(-0.68)
LNTA	-0.003	(-0.93)
Other NAS	0.004	(0.56)
BIG4	-0.002	(-0.15)
ROA	-0.137***	(-3.78)
BTM	0.038***	(3.44)
LEV	0.087***	(3.35)
Constant	0.271***	(3.77)
Industry Fixed Effects	Yes	
Observations	5,680	
Pseudo R^2	0.078	

, **, and * indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Panel B: Regression Tests of AC Score on Earnings Quality

$$EQ_{it} = \sum a_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 AC_i + \beta_4 POST_i*TREAT_i + \beta_5 TREAT_i*AC_i + \beta_6 POST_i*AC_i + \beta_7 POST_i*TREAT_i*AC_i + \sum \mu_{it} Control_{it} + \varepsilon \quad (2b)$$

Variables	Prior_Earnings	Small_Positive	DACC	$DACC_{t-1}$
TREAT	-0.047	-0.025	0.044	0.066
	(-0.75)	(-1.39)	(0.66)	(1.16)
POST	-0.143**	-0.042**	0.015	0.026
	(-2.33)	(-2.36)	(0.23)	(0.47)
AC	-0.028*	-0.003	-0.003	0.003
	(-1.74)	(-0.65)	(-0.18)	(0.21)
*POST*TREAT*	0.151*	0.070***	-0.012	-0.018
	(1.76)	(2.83)	(-0.14)	(-0.23)
*TREAT*AC*	0.017	0.008	-0.008	-0.018
	(0.78)	(1.21)	(-0.33)	(-0.87)
*POST*AC*	0.027	0.012**	0.006	0.007
	(1.28)	(1.97)	(0.28)	(0.38)
*POST*TREAT*AC*	-0.052*	-0.023***	0.004	0.009

	(-1.74)	(-2.70)	(0.12)	(0.31)
RD	0.184*	0.033	-0.017	-0.016
	(1.69)	(1.04)	(-0.15)	(-0.16)
FI	0.396**	-0.009	-0.231	-0.035
	(2.45)	(-0.20)	(-1.35)	(-0.24)
NPPE	-0.139***	0.009	0.009	-0.084*
	(-2.65)	(0.58)	(0.16)	(-1.76)
CASH	0.050	0.006	-0.097**	0.071*
	(1.13)	(0.49)	(-2.08)	(-1.78)
DEP	0.987***	0.032	-0.893***	-0.945***
	(4.27)	(0.48)	(-3.65)	(-4.49)
LNTA	-0.005	-0.007***	0.006	-0.001
	(-1.11)	(-5.39)	(1.21)	(-0.36)
Other NAS	0.001	0.007**	-0.005	-0.004
	(0.12)	(2.24)	(-0.47)	(-0.42)
BIG4	0.012	-0.006	-0.029	-0.004
	(0.59)	(-1.02)	(-1.35)	(-0.22)
ROA	0.786***	0.032**	-0.099**	-0.174***
	(16.88)	(2.36)	(-2.01)	(-4.11)
BTM	-0.088***	0.009**	0.004	-0.025*
	(-6.25)	(2.18)	(0.24)	(-1.95)
LEV	-0.051	0.013	-0.019	-0.065**
	(-1.53)	(1.38)	(-0.53)	(-2.15)
Constant	0.767***	0.099***	-0.233**	-0.001
	(8.31)	(3.72)	(-2.39)	(-0.01)
Industry Fixed Effects	Yes	Yes	Yes	Yes
N	5,680	5,680	5,680	5,680
R^2	0.104	0.022	0.072	0.082

*T-statistics in parentheses. *, **, and *** indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

Panel C: Regression Tests of AC Score on Tax Avoidance

$$TA_{it} = \sum a_i F_i + \beta_1 TREAT_i + \beta_2 POST_i + \beta_3 AC_i + \beta_4 POST_i{*}TREAT_i + \beta_5 TREAT_i{*}AC_i + \beta_6 POST_i{*}AC_i + \beta_7 POST_i{*}TREAT_i{*}AC_i + \sum \mu_{it} Control_{it} + \varepsilon_{it} \quad (2c)$$

Variables	Book_ETR	Cash_ETR	DTAX
TREAT	-0.073***	-0.029	-0.428**
	(-2.68)	(-1.07)	(-2.56)
POST	-0.036	-0.055**	-0.376**
	(-1.36)	(-2.02)	(-2.28)
AC	-0.019***	-0.016**	-0.089**
	(-2.69)	(-2.27)	(-2.09)

*POST*TREAT*	0.039	0.055	0.719***
	(1.05)	(1.45)	(3.12)
*TREAT*AC*	0.023**	0.010	0.111*
	(2.39)	(1.01)	(1.83)
*POST*AC*	0.023**	0.036***	0.154***
	(2.45)	(3.85)	(2.71)
*POST*TREAT*AC*	-0.019	-0.023*	-0.167**
	(-1.46)	(-1.73)	(-2.08)
RD	-0.010	-0.124***	0.206
	(-0.22)	(-2.58)	(0.70)
FI	0.080	-0.046	0.189
	(1.14)	(-0.64)	(0.44)
NPPE	-0.037	0.049**	-0.383***
	(-1.61)	(2.13)	(-2.73)
CASH	-0.108***	-0.086***	-0.452***
	(-5.59)	(-4.44)	(-3.82)
DEP	0.021	0.036	1.542**
	(0.21)	(0.36)	(2.49)
LNTA	0.013***	0.007***	0.029**
	(6.41)	(3.79)	(2.41)
Other NAS	-0.000	0.002	0.049*
	(-0.05)	(0.33)	(1.76)
BIG4	0.003	0.033***	0.001
	(0.30)	(3.79)	(0.03)
ROA	0.246***	0.137***	0.374***
	(12.12)	(6.68)	(2.99)
BTM	-0.025***	-0.010	0.042
	(-4.13)	(-1.54)	(1.10)
LEV	-0.134***	-0.093***	-0.001
	(-9.25)	(-6.37)	(-0.01)
Constant	0.163***	0.048	0.347
	(4.06)	(1.18)	(1.40)
Industry Fixed Effects	Yes	Yes	Yes
N	5,680	5,680	5,675
R^2	0.163	0.119	0.130

*T-statistics in parentheses. *, **, and *** indicate p<0.10, p<0.05, and p<0.01, respectively, for a two-tailed test. Variables are defined in the Appendix.*

UNTABULATED SUPPLEMENTAL ANALYSES

100% APTS Purchases Reduction

In this untabulated analysis, I examine whether the main results are robust to different APTS fees reduction cutoffs. I require the treatment firms to completely drop APTS purchases (i.e., 100% reduction in APTS fees compare to the previous year scaled by lagged tax fees). In untabulated results, I find that the treatment firms

report less restatements and are less likely to report small positive earnings during the PCAOB period. Such impact on audit quality is more pronounced in the treatment firms with larger audit committees. Overall, the results are robust to a different reduction cutoff of APTS purchases.

Firms Never Purchased APTS

To further validate the finding using the difference-in-differences method, I use firms that never purchased APTS in both the SOX and the PCAOB periods as the control firms. Untabulated results are generally consistent with previous findings that the treatment firms improve their audit quality in the PCAOB period. Also, the treatment firms with audit committee financial experts have higher quality of accruals. Overall, the results are robust using alternative control sample firms.

CONCLUSION

Over the last decade, U.S. regulators have imposed restrictions on APTS purchases through the SOX and the PCAOB rules, although the PCAOB rules and the SOX are different in nature. The SOX does not prohibit any types of APTS and allow firms' audit committees to pre-approve APTS purchases. The PCAOB rules, however, prohibit three specific aggressive tax transactions and services. Little is known about whether the PCAOB rules are more effective than the SOX to attenuate the negative impact of APTS purchases on firms' audit quality, earnings quality, and aggressive tax avoidance activities. This study examines this issue. More importantly, I also examine whether such impact is more pronounced when there is more effective audit committee oversight.

The results show that the PCAOB restrictions on APTS purchases are associated with reduced subsequent financial restatements. It has little impact on earnings quality or tax avoidance. I also find that the treatment firms with more effective audit committee oversight are less likely to meet or beat earnings targets and are negatively associated with discretionary permanent book-tax differences. These findings support the notion that effective audit committee oversight can alleviate negative impact of APTS on auditor independence and further curtail aggressive tax planning. The results should be of interest to U.S. accounting and audit regulators such as the SEC and PCAOB, public accounting firms, auditors, corporate audit committees.

ENDNOTES

1. As a result of the SOX, the SEC revised its auditor independence rules including its list of nine categories of prohibited NAS (SEC Release No. 33-8183, 2003). The revised rules were effective on May 6, 2003 and prohibited NAS including bookkeeping or other services related to the accounting records or financial statements of the audit client; financial information systems design and implementation; appraisal or valuation services, fairness opinions, or contribution-in-kind reports; actuarial services; internal audit outsourcing services; management functions or human resources; broker or dealer, investment adviser, or investment banking services; expert services; and any other service depending on the circumstances etc.
2. The SOX regulation period begins with the first fiscal year data available on separately fees disclosure in 2002 and ends on the date before the release of PCAOB restrictions on July 26, 2005. Firms that report tax fees in their financial statements are firms with APTS purchases.
3. Firms that have never purchased APTS during the sample period are also used as the control group in the additional analyses.
4. I also test companies dropped APTS completely (100% tax fees reduction) under the PCAOB regulation as a robustness check in the Supplemental Analyses.
5. I used tax restatements and going-concern opinions as measures of audit quality following Lennox (2016) and find similar insignificant results.
6. Annual percentage reductions in tax fees are scaled by lagged tax fees.
7. Following Frank et al. (2009) and Wilson (2009), I used total book-tax differences (BTDit) and tax-shelter scores (Shelterit) as measures of tax aggressiveness but do not find significant results.
8. Because the PCAOB rules became effective on October 31, 2006, I include firms dropped APTS purchases within one fiscal year after the effective date.

9. Untabulated results show that most of firms with significant decrease in tax fees in the PCAOB period dismissed Big4 accounting firms as their tax providers. The data shows that Ernst&Young, PwC, Deloitte and Touche, KPMG, Grant Thornton, and BDO are the top six public accounting firms who were dismissed by their clients as tax providers.

10. Each treatment firm is matched to a control firm based on the most recent firm observation available in the pre period as I believe this captures the possible similarity of company characteristics and performance right before the PCAOB regulation.

11. Untabulated results find that after I replaced AC_Score with the proportion of tax experts on the audit committee the results are statistically insignificant, indicating that tax experts do not improve audit and earnings quality and tax avoidance following the PCAOB restrictions

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