

CORPORATE TAX AGGRESSIVENESS, AUDITOR PROVIDED TAX  
SERVICES, AND AUDIT QUALITY: EVIDENCE FROM RECENT  
PCAOB RULES CONCERNING INDEPENDENCE AND TAX SERVICES

by

By Kellie M. Carr

A Dissertation Submitted to Faculty of the  
College of Business in  
Partial Fulfillment of the Requirements for the  
Degree of Doctor of Philosophy

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by

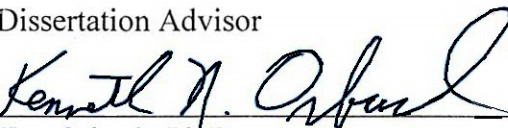
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This dissertation was prepared under the direction of the candidate's dissertation advisor, Dr. Jian Cao, Department of Accounting, and has been approved by the members of her supervisory committee. It was submitted to the faculty of the College of Business and was accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.


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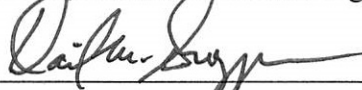
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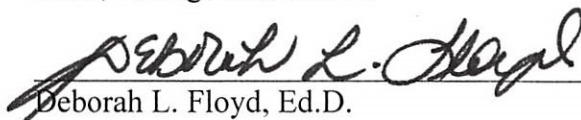
  
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## ABSTRACT

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Title: Corporate Tax Aggressiveness, Auditor Provided Tax Services, And Audit Quality: Evidence From Recent PCOAB Rules Concerning Independence And Tax Services  
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Using tax accrual quality as a proxy for audit quality, I investigate whether companies that significantly decreased APTS surrounding the effective date of the Public Company Accounting Oversight Board's 2006 Rules on Ethics, Independence, and Tax Services experienced an improvement in audit quality after the change. Given the specific target of the PCAOB 2006 restrictions is companies aggressively avoiding taxes with the assistance of APTS, I also investigate whether companies associated with tax aggressive services are also more likely to experience an improvement in audit quality following the reductions in APTS.

Results suggest an increase in audit quality due to a reduction in economic bonding following APTS restrictions. Consistent with the economic bonding theory, companies that significantly reduced APTS experienced a larger improvement in audit quality after the change compared to companies that did not significantly reduce APTS.

For tax aggressive companies, those that reduced APTS did experience a significant increase in audit quality after the change compared to tax aggressive companies that did not significantly reduce APTS. Moreover, companies considered important tax clients by their audit firms that significantly reduced APTS did experience a marginally greater increase in audit quality after the change compared to other important tax clients that did not significantly reduce APTS.

Overall, my results indicate that the PCOAB 2006 restrictions were effective in decreasing APTS and economic bonding, thereby leading to improved audit quality, especially among companies associated with tax aggressive services. Accordingly, concerns for loss of knowledge spillover seem to be minimal. There are few studies that investigate the effectiveness of the PCAOB 2006 restrictions on audit quality. Therefore, my study fills this void by using a tax specific measure of audit quality, tax accrual quality, to specifically examine the target of the restrictions— audit clients that are associated with aggressive tax services. My study confirms and expands APTS, economic bonding, audit quality, tax accrual quality, and tax aggressive research, and also provides insight into and support for current policy debates concerning APTS and tax aggressive services.

## DEDICATION

I dedicate this dissertation to my parents, who taught me the importance of questioning and seeking the truth, and for their encouragement and support to change direction, midstream, by seeking my Masters of Science in Taxation and Ph.D.

Chi-miigwech



CORPORATE TAX AGGRESSIVENESS, AUDITOR PROVIDED TAX SERVICES,  
AND AUDIT QUALITY: EVIDENCE FROM RECENT PCAOB RULES  
CONCERNING INDEPENDENCE AND TAX SERVICES

LIST OF TABLES .....	x
LIST OF FIGURES .....	xii
CHAPTER 1: INTRODUCTION .....	1
CHAPTER 2: LITERATURE REVIEW .....	15
2.1 Regulatory Background .....	16
2.2 Economic Bonding vs Knowledge Spillover .....	22
2.3 The Relation between Non-Audit Services (NAS) and Audit Quality .....	28
2.4 The Relation between Auditor Provided Tax Services (APTS) and Audit Quality.....	32
2.4.1 Increase in Audit Quality with APTS .....	33
2.4.2 No Change in Audit Quality with APTS .....	35
2.4.3 Comprised Audit Quality with APTS .....	35
2.4.4 Determinants of Voluntary Disclosure of APTS .....	36
2.4.5 Impact of the PCOAB 2006 Restrictions.....	37
2.4.6 Audit Quality Measures .....	38
2.4.7 APTS Measures .....	40
2.5 The Effect of APTS on Tax Avoidance.....	40
2.6 Determinants of and Reduction in APTS.....	43

2.7 Literature Summary .....	45
CHAPTER 3: HYPOTHESES.....	47
3.1 PCAOB 2006 Restrictions' Effectiveness .....	47
3.2 PCAOB 2006 Restrictions' Effectiveness: Tax Aggressive Clients.....	49
3.3 PCAOB 2006 Restrictions' Effectiveness: Client Importance .....	53
CHAPTER 4: RESEARCH DESIGN.....	57
4.1 Implementing the Propensity Score Matched Pair Design .....	57
4.2 Measuring Tax Accrual Quality (taxaq) .....	60
4.3 Identifying Pre vs Post (post) PCAOB restrictions period .....	61
4.4 Main Regression Model.....	62
4.4.1 Testing Hypothesis.....	66
4.4.2 Testing Hypothesis 2: Tax Aggressive Group (aggressive) .....	66
4.4.3 Testing Hypothesis 3 (Importance).....	69
CHAPTER 5: SAMPLE .....	72
5.1 Sample Selection and Data .....	72
5.2 APTS, NAS and Audit Fee Statistics.....	73
5.3 Determinants of Reduce Companies: Descriptive Statistics.....	75
5.4 Determinants of Reduce Companies: Results From Implementing the Propensity Score Matching Approach .....	76
5.5 Determinants of Tax Accrual Quality.....	77
CHAPTER 6: RESULTS.....	79
6.1 Descriptive Statistics.....	79
6.2 Hypothesis Testing: Full Sample .....	80

6.2.1 Hypothesis 1.....	80
6.2.2 Hypothesis 2.....	82
6.2.3 Hypothesis 3.....	84
6.3 Hypothesis Testing: Matched Sample .....	86
6.3.1 Hypothesis 1.....	86
6.3.2 Hypothesis 2.....	87
6.3.3 Hypothesis 3.....	90
6.4 Main Regression Model Subsample Testing .....	91
6.4.1 By Aggressive.....	91
6.4.2 By Importance.....	92
6.5 Additional Analysis .....	94
CHAPTER 7: CONCLUSION .....	97
APPENDIX A: PCAOB Rules on Ethics, Independence, and Tax Services.....	100
APPENDIX B: Variable Definitions .....	107
REFERENCES .....	140

## TABLES

Table 1: Sample Selection .....	110
Table 2: Fees by Year and Window.....	111
Panel A: By Year - Mean Fees .....	111
Panel B: By Window - The Percentage Reduction in APTS and Other Non-Audit Fees, and the Percentage Increase in Audit Fees.....	112
Table 3: Descriptive Statistics – Matched Model (2) .....	113
Panel A: Full Sample .....	113
Panel B: Sample by Reduce.....	114
Table 4: Results Matched Model (2) .....	115
Table 5: Descriptive Statistics – Matched Sample .....	116
Table 6: Descriptive Statistics – Model (4) .....	117
Panel A: Full Sample .....	117
Panel B: Matched Sample.....	117
Table 7: Descriptive Statistics – Model (4) Spearman/Pearson Correlations.....	118
Panel A: Full Sample .....	118
Panel B: Matched Sample.....	119
Table 8: Results Model (4) Full Sample .....	120
Table 9: Results Model (5) Full Sample .....	121
Panel A: Regression Results .....	121
Panel B: Hypotheses 2a and 2b Test Results.....	122

Table 10: Results Model (6) Full Sample .....	123
Panel A: Regression Results .....	123
Panel B: Hypothesis 3 Test Results .....	124
Table 11: Results Model (4) Matched Sample .....	125
Table 12: Results Model (5) Matched Sample .....	126
Panel A: Regression Results .....	126
Panel B: Hypotheses 2a and 2b Test Results .....	127
Table 13: Results Model (6) Matched Sample .....	128
Panel A: Regression Results .....	128
Panel B: Hypothesis 3 Test Results .....	129
Table 14: Results Model (4) Subsample by Aggressive .....	130
Panel A: Full Sample – Aggressive .....	130
Panel B: Full Sample – Not Aggressive .....	131
Panel C: Matched Sample – Aggressive .....	132
Panel D: Matched Sample – Not Aggressive .....	133
Table 15: Results Model (4) Subsample by Importance .....	134
Panel A: Full Sample – Important .....	134
Panel B: Full Sample – Not Important .....	135
Panel C: Matched Sample – Important .....	136
Panel D: Matched Sample – Not Important .....	137
Table 16: Results Model (4) Controlling for Audit Effort .....	138
Panel A: Full Sample .....	138
Panel B: Matched Sample .....	139

## FIGURES

Figure 1: Timeline.....	109
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## CHAPTER 1 INTRODUCTION

The Public Company Accounting Oversight Board (PCAOB) Rules on Ethics, Independence, and Tax Services (PCAOB 2006) are intended to increase auditor independence by prohibiting registered public accounting firms from providing contingent fee based and aggressive tax consulting services to their Securities and Exchange Commission (SEC) regulated audit clients (PCAOB 2005, 2006). When accounting firms provide both audit and auditor provided tax services (APTS), an economic bond is created which can reduce auditor independence and thus, reduce audit quality (DeAngelo 1981). Regulators are concerned that tax aggressive APTS, in particular, can significantly affect a company's tax obligations and financial reporting, and place the auditor in the position of auditing its own work. However, the joint provision of audit and tax services by the same accounting firm also generates knowledge spillovers that could lead to more efficient and higher quality audits (e.g., Kinney et al. 2004; Simunic 1981). Under the PCAOB restrictions, the benefit of increased audit quality from a knowledge spillover is missing. Prior studies on the effect of APTS have yielded mixed evidence. There is some evidence indicating either no change in audit quality related to APTS fees (e.g., Cripe and McAllister 2009; Cook and Omer 2013; Lennox 2016) or increased audit quality related to APTS fees (e.g., Kinney et al. 2004; Gleason and Mills 2011; Seetharaman et al. 2011). Few studies have examined the consequences of the PCAOB 2006 restrictions on audit quality. Using tax accrual quality as a proxy for audit quality, I investigate whether companies that significantly decreased

APTS surrounding the effective date of the PCAOB 2006 restrictions experienced an improvement in audit quality after the change compared to companies that did not significantly reduce APTS. Given the specific target of the PCAOB 2006 restrictions is companies aggressively avoiding taxes with the assistance of APTS, I also investigate whether companies associated with tax aggressive services are also more likely to experience an improvement in audit quality following the reductions in APTS.

The PCAOB 2006 restrictions are not the first regulation meant to increase auditor independence when joint services are provided by the same accounting firm. The demise of Enron and Arthur Anderson led to the Sarbanes-Oxley Act of 2002 and Title II of the act was passed to increase auditor independence. Title II prohibits certain audit-client relationships and most non-audit service (NAS), and essentially transfers audit oversight to the audit committee. It requires audit partner rotation, audit committees to pre-approve any NAS or potential service which may impair auditor independence and the auditor to report to the audit committee (U.S. Congress 2002). When considering which NAS to prohibit, regulators debated how each type of NAS creates different incentives that affect audit quality. Although accounting firms have incentives to protect their reputation and avoid litigation by providing high quality audits, regulators are concerned that these auditor incentives may be weaker than the incentive to impair auditor independence created by an economic bond. Therefore, regulators are concerned that the net result is impaired auditor judgement and thus, reduced audit quality. Although APTS is one type of NAS, it was specifically not prohibited by SOX. Prior research suggests that APTS improve audit effectiveness through a knowledge spillover (Simunic 1981), which can either offset or exceed the potential reduction in audit quality



caused by auditor independence impairment created by economic bonding. Cripe and McAllister (2009) report that 43% of chief financial executives purchase APTS because of the knowledge spillover benefit, which is created when client specific knowledge is shared between the tax and audit teams and thus, can improve audit quality. This suggests that APTS are a unique type of NAS that provides stronger knowledge spillover than other types of NAS. Because tax service providers must understand the structure and operations of the whole company where some NAS providers need only understand a job specific area of the company, the APTS contribution to knowledge spillover may have a stronger positive impact on audit quality than the contribution of other types of NAS. Overall, although most NAS is prohibited by SOX to improve auditor independence, APTS are specifically allowed by SOX possibly due to the stronger knowledge spillover benefit.

While the PCAOB 2006 restrictions extended SOX by improving auditor independence standards, the PCAOB 2006 restrictions are the first to specifically restrict APTS. Prior to the restrictions and during the investigation into accounting firm tax shelter abuses, including the KPMG criminal tax shelter fraud<sup>1</sup>, regulators learned that some accounting firms were not only selling aggressive tax services, but selling them for contingent fees, and also selling personal tax services to audit client executives responsible for overseeing the relationship between the company and auditor (Permanent Subcommittee on Investigations 2005) (GAO 2005). The potential strong economic bond resulting from these transactions heightened regulator concerns about auditor

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<sup>1</sup> The KPMG tax shelter fraud was exposed in 2003. It led to KPMG admitting they engaged in criminal fraud that generated at least \$11 billion dollars in phony tax losses and at least \$2.5 billion dollars in evaded taxes (IRS 2005).

independence impairment and led to the PCAOB 2006 restrictions.<sup>2</sup> Rule 3521 of the PCAOB 2006 restrictions (PCAOB 2006) prohibits regulated accounting firms from using a contingent fee arrangement in any transaction with a SEC audit client. Rule 3522 of the PCAOB 2006 restrictions was the first regulation that specifically targeted APTS. This rule prohibits SEC regulated accounting firms from marketing, selling or opining a tax treatment or transaction which is confidential or tax aggressive to their SEC regulated audit client, including recommending, either directly or indirectly, a tax aggressive position transaction. Moreover, since each tax strategy has a reporting effect, if a firm provides tax strategies to a company for which it also serves as an auditor, it could end up having to audit its own work. Rule 3523 prohibits a registered public accounting firm from providing any tax service to a person in a financial reporting oversight role at the issuer audit client, or an immediate family member of such person.

Prior NAS studies mainly investigate the association between NAS and reduced auditor independence, whereas a subset of APTS studies focus on the offsetting effects of auditor independence impairment and knowledge spillover. NAS study results are mixed, as some find no evidence of impaired auditor independence associated with NAS, while others find increased auditor independence suggesting that the reason is offsetting auditor reputational concerns and litigation avoidance. There is little evidence linking NAS and knowledge spillover. Because NAS is comprised of different types of service, each service has its own individual effect on audit quality and therefore, mixed results are not surprising. On the other hand, APTS are a specific type of NAS. Studies find that APTS either increase (e.g., Kinney et al. 2004; Gleason and Mills 2011; Seetharaman et

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<sup>2</sup> See appendix A for the independence rules of the PCAOB 2006 restrictions and their effective dates.

al. 2011) or do not change (e.g., Cripe and McAllister 2009; Cook and Omer 2013; Lennox 2016) audit quality, and recent research on APTS has focused on how and where knowledge spillover occurs (De Simone et al. 2015). Few studies find lower audit quality related to APTS (e.g., Cook et al. 2008; Choudhary et al. 2015). Companies often purchase APTS because of knowledge spillover benefits. Colleen Sayther, Financial Executives International, states “I think that having the audit firm perform certain tax services enhances the quality of the audit, as we've stated several times today. It enables the knowledge spillover and enhanced communication between the tax side and the audit side” (PCAOB, 2004, p. 183).

Although there was a decline in APTS fees after SOX, there appears to be a more significant decline surrounding the effective dates of the PCAOB 2006 restrictions. Lennox (2016) finds a 40.9% reduction in mean APTS fees and a 46.14% decline in the number of companies purchasing APTS between 2005 and 2006. This is a significant change to the tax service industry as it realigned clients and tax service providers. For companies reducing their APTS, they are either choosing another accounting firm, a tax consulting firm, their internal tax department, or a combination of these options to provide their tax services. When a company eliminates APTS, it mitigates concerns about the negative effects of economic bonding and thus, increases auditor independence and audit quality. However, it also eliminates the benefits of knowledge spillover and thus, reduces audit quality. Furthermore, when a tax consultant or other accounting firm does not thoroughly consider the ramifications of their tax planning and positions on their client’s financial statements, there is a loss of knowledge spillover that can lead to reduced audit quality. Thus, the change in the offsetting effects of economic bonding and

knowledge spillover, as a result of the separation of jointly provided tax and audit services, will either increase or decrease audit quality.

Nonetheless, few studies investigate the impact of the PCAOB 2006 restrictions on audit quality. Lennox (2016) compares the change in audit quality of the companies that significantly dropped APTS when the PCAOB 2006 restrictions were announced to the companies that did not significantly drop APTS. Using the incidence of accounting misstatements, tax-related misstatements and going concern opinions as alternate proxies for audit quality and an indicator variable as proxies for APTS, Lennox (2016) finds no change in audit quality for companies that reduced APTS compared to companies that did not reduce.

My study fills the gap in the literature by investigating the effects of the PCAOB 2006 restrictions by using tax accrual quality to capture the offsetting effects of knowledge spillover and independence impairment. I not only examine the PCAOB 2006 restrictions impact on audit quality for SEC regulated companies that purchase APTS, but also on tax aggressive companies that also purchase APTS– the target of the restrictions, and its targeted intention– to eliminate the potentially strong economic bond resulting from aggressive APTS.

I use propensity score matching and a difference-in-difference research design to investigate whether the group of companies that significantly reduced APTS surrounding the restrictions effective date had higher tax accrual quality after the reduction compared to the group of companies that did not significantly reduce APTS. Since the restrictions are meant to increase auditor independence and audit quality, there should be an increase in tax accrual quality for the group of companies that significantly reduced APTS and

thus, increased tax accrual quality would indicate greater auditor independence impairment and decreased tax accrual quality would indicate greater knowledge spillover associated with APTS.

I use a tax specific proxy, tax accrual quality (Choudhary et al. 2016), to represent audit quality. Prior APTS studies use accounting financial statement restatements (e.g., Lennox 2016; Kinney et al. 2004; Seetharaman et al. 2011; Ferguson et al. 2004) or going concern opinions (e.g., Lennox 2016) as a proxy for audit quality. The results of these studies are mixed and the reason may be the chosen proxy. Tax accounts are rarely the primary account involved in a restatement (Badertscher et al. 2008) and APTS directly affect the tax accounts. Furthermore, restatements and going concern opinions capture a wide variety of unintentional effects outside the influence of APTS on audit quality. Tax account quality varies greatly without reaching the extreme point of causing restatement. Thus, the variation in tax accrual quality is not captured when using restatements. Also, auditors are reluctant to issue restatements because they are costly (Palmrose and Scholz 2004). Alternatively, tax accounts isolate the joint product of the auditor and tax provider and capture the effect of economic bonding and knowledge spillover found in the tax accounts. More specifically, tax accrual quality pinpoints the quality of the tax accounts by measuring the variation in the mapping of the income tax accrual into tax-related cash flows with a higher variation indicating lower audit quality. The proxy captures intentional and unintentional errors in estimating the tax accounts. The variation directly captures the effects of economic bonding and knowledge spillover created from joint audit and APTS. Therefore, tax accrual quality is a potentially better proxy than others to represent audit quality when investigating its association with APTS.

Furthermore, I examine companies specifically targeted by the PCAOB 2006 restrictions—audit clients who are associated with aggressive tax services. Regulators focused on aggressive tax services because they may create stronger economic incentives and self-review threats for the auditor and thus, raise questions about the auditor’s objectivity and impartiality in conducting an audit of a company. This is consistent with Frank et al. (2009) who report a strong, positive relation between aggressive tax and financial reporting. Regulators, including the PCAOB and the Internal Revenue Service (IRS), are scrutinizing the tax avoidance practice of companies. William J. McDonough, chairman of the PCAOB, wants “to understand better how tax and audit functions interact” (PCOAB 2004, p.6). Furthermore, Kubick et al. (2016) find that aggressive tax practice is subject to scrutiny by the SEC, via tax-related SEC comment letters. The IRS aims to reduce aggressive tax avoidance and the scrutiny by the SEC assists in this effort. Regulators are concerned that auditors’ aggressive tax services lower audit quality because the issue of independence is particularly acute when aggressive APTS are linked to contingent or high fees. Since the restrictions on APTS and aggressive tax services can weaken the economic bond between the client and auditor, it would be interesting to examine whether the impact of PCAOB 2006 restrictions on audit quality improvements is more pronounced for companies associated with aggressive tax services. On the other hand, companies associated with aggressive tax practices are exposed to greater regulatory scrutiny and litigation risk. Moreover, since estimating the tax accounts of tax aggressive companies is more complex and carries a higher risk of misstatement, it requires a higher level of understanding and judgement by auditors. Therefore, the

reductions in APTS fees could also result in a greater loss of knowledge spillover for companies that are associated with aggressive tax services.

I examine two groups of companies potentially targeted by the PCAOB 2006 restrictions on aggressive tax services— companies that have aggressive tax avoidance strategies via the purchase of APTS and large clients that are a significant source of audit firms' tax service revenue. First, I examine if the change in their audit quality after the reduction of APTS is higher for tax aggressive companies than for less tax aggressive companies. I partition my sample into the group of tax aggressive companies and the group of less tax aggressive companies by identifying a company's tax avoidance level prior to their reduction of APTS using the cash effective tax rate (ETR), book ETR, and permanent book-tax differences following Hanlon and Heitzman (2010), McGuire et al. (2012), and Kubick et al. (2016). Second, I examine if the change in audit quality after the reduction of APTS is higher for formerly important tax clients at the local office level. Similar to Reynolds and Francis (2001), I use client importance specific to the tax function as a measure of the economic bond created by APTS fees. A large amount of APTS can result in high tax consulting fees as well as contingent fees associated with tax aggressive APTS. Therefore, large, more important tax clients create an economic dependence that may cause auditors to compromise their judgment. I measure client tax importance (importance) as total tax fees from a single client relative to total tax fees received from all audit clients in a given office within a particular industry and Metropolitan Statistical Area (MSA) city and represents economic bonding at the local office level.

Results indicate a significant decline in APTS fees during the PCAOB 2006 restrictions implementation period from July 26, 2005 to October 31, 2006. The percentage of observations that reported a reduction in APTS fees is 40.14%, while the average magnitude of the reduction is 52.33%. The frequency and magnitude of reduction in APTS are consistent with auditor reputation protection and litigation avoidance, and at that time, mitigating negative publicity received by KPMG and other accounting firms over aggressive tax services.

I find that companies that significantly reduced APTS tend to have high APTS fees prior to the PCAOB restrictions, also have reduced other NAS during the same time, and be smaller in size. These findings are consistent with the PCAOB premise that the reduction in APTS mitigates the impact of economic bonding on audit quality.

I also find a significant increase in tax accrual quality surrounding the PCAOB 2006 restrictions for companies that significantly reduced APTS compared to those that did not significantly reduce APTS. Moreover, those that significantly reduced APTS, whether or not aggressive and whether or not important, had a larger increase in tax accrual quality than companies that did not significantly reduce APTS. This is consistent with a reduction in the economic bond created between a client and their accounting firm when both audit and NAS are provided by the same accounting firm. The bond can reduce auditor independence and lead to lower audit quality. By reducing APTS (one type of NAS), I find an increase in audit quality, which is consistent with increased auditor independence.

Furthermore, for tax aggressive companies, those that reduced APTS had a significantly greater increase in tax accrual quality than tax aggressive companies that did



not significantly reduce APTS. Among companies that significantly decreased APTS, tax aggressive companies experienced a significant increase in tax accrual quality while not tax aggressive companies did not, although the difference in the increases did not reach statistical significance. In addition, tax aggressive companies had lower audit quality than not tax aggressive companies in the period prior to the implementation of the PCAOB 2006 restrictions. For companies considered economically important by accounting firms, there is a greater, albeit marginally significant, increase in tax accrual quality surrounding the PCAOB 2006 restrictions for important clients that significantly decreased APTS than for important clients that did not significantly reduce APTS. These findings largely support the conjecture that companies associated with tax aggressive services are also more likely to experience an improvement in audit quality following the reductions in APTS. Overall, my results indicate that the PCOAB 2006 restrictions were effective in decreasing APTS and economic bonding, thereby leading to improved audit quality, especially among companies associated with tax aggressive services. Accordingly, concerns for loss of knowledge spillover seem to be minimal.

My study provides several contributions to literature. It extends and clarifies the work of Choudhary et al. (2015, 2016) by using tax accrual quality as a proxy for audit quality and for finding that a decline in APTS fees increases tax accrual quality. Second, it extends prior APTS studies and marginally supports the theory that APTS compromise audit quality by reducing auditor independence via economic bonding (e.g. DeAngelo 1981; Cook et al. 2008; Choudhary et al 2015). Prior studies have produced mixed findings about whether and how APTS affect audit independence and audit quality and few studies have examined the effect of the PCAOB 2006 restrictions on audit quality. I

examine how the PCAOB restrictions on tax services impact tax accrual quality. I chose to examine a tax-specific measure of audit quality as regulators are concerned about the impact of APTS on tax accounts and financial statements. Auditor independence impairment caused by economic bonding is most likely to be found in the tax accounts, at the intersection of audit and APTS, therefore, regulators are interested in how the effect of these joint services affect the quality of tax accounts. Tax accrual quality, a tax account quality measurement, captures the variation in the estimation error of the tax accounts and is the most likely location to discover both effects of economic bonding and knowledge spillover, therefore tax accrual quality may potentially be a better proxy than others to capture the association between APTS and audit quality. Indeed, my results confirm that economic bonding can be found in the tax accounts and that the use of tax accrual quality is potentially a better proxy for audit quality.

Third, I extend the work investigating the relationship between aggressive tax avoidance and audit quality (e.g. Frank et al. 2009) by finding that companies identified as tax aggressive have significantly lower audit quality than companies not considered tax aggressive. Audit quality, for these companies, can be increased by significantly reducing APTS. Because companies considered tax aggressive are associated with lucrative fees, I found the reduction in economic bonding from a significant decline in APTS fees equates to higher audit quality. Furthermore, I identified and examined how companies specifically targeted by the PCAOB 2006 restrictions, companies that purchased aggressive APTS responded to increased tax service scrutiny and more specifically, to the PCAOB 2006 restrictions. Companies wanting to either begin or continue to practice aggressive tax avoidance could no longer purchase APTS, so they

were forced to choose either a different auditor or different tax provider. Because APTS declined surrounding the PCAOB 2006 restriction effective date, it appears that most companies choose another tax provider or brought the service in-house.

Fourth, I confirm and extend the studies examining the effects of client importance on economic bonding, reputation protection, and litigation avoidance (e.g. Kinney et al. 2004; Reynolds and Francis 2001). I find some evidence that the effects of APTS reduction on audit quality is strong for important clients, consistent with greater concerns for reputation protection and litigation avoidance for these higher risk clients.

Finally, my study also provides insight for regulators as they debate policy implications and for researchers and others who are interested in economic bonding, knowledge spillover, auditor independence, tax accrual quality, client importance, aggressive and less aggressive tax avoidance, and APTS. Although the debate over NAS and reduced audit quality subsided after SOX, it was renewed following the increasing awareness of regulators that many accounting firms were supplying aggressive tax services to their audit clients. The KPMG criminal tax shelter fraud was exposed in 2003 and although it did not involve tax aggressive services to audit clients, its investigation further exposed the extent of abusive tax shelters sold by accounting firms. As the investigations unfolded, regulators and the press linked APTS not only to impaired auditor independence, but also to significantly impaired auditor independence resulting from strong economic bonding from aggressive APTS. Because of the negative publicity and increased regulatory scrutiny related to tax services, companies not practicing aggressive tax avoidance strategies want to distance themselves from APTS and from KPMG (Finley and Stekelberg 2016). Thus, some companies that made the change away

from APTS did not do so because they wanted to practice aggressive tax avoidance with the assistance of APTS, they did so because they are sensitive to the reputational costs of not changing (e.g., Bedard et al. 2010; Bedard and Pacquette 2010).

Rule 3522 of the PCAOB 2006 restrictions is the first regulation to prohibit any type of APTS. Although there is a void in the literature investigating the effect of the PCAOB 2006 restrictions on audit quality, there appears to be even less literature examining the regulation's effect on audit quality for tax aggressive companies. The results of my study contribute to the understanding of how economic bonding and knowledge spillover affect the relation between APTS and tax accrual quality for companies practicing both aggressive and less aggressive tax avoidance.

The remainder of my proposal is organized as follows: Chapter 2 provides a literature review. Chapter 3 develops and states my hypotheses. Chapter 4 presents my research design, Chapter 5 describes the sample, Chapter 6 presents results, and Chapter 7 concludes.

## CHAPTER 2 LITERATURE REVIEW

The purpose of this chapter is to review and highlight the gaps in APTS literature. I begin with a summary of relevant regulation changes to understand the motivation behind the studies, then continue with the theoretical base for my study— economic bonding versus knowledge spillover. Further, I review NAS literature because APTS are one type of NAS and NAS studies are a precursor to APTS studies.

I review the long-standing debate over whether the provision of NAS can impair auditor independence and the development of U.S. regulatory prohibitions to limit economic bonding created by NAS and APTS in section 2.1. The PCAOB 2006 restrictions on tax services led to a significant reduction in APTS.

I discuss economic bonding versus knowledge spillover as antecedents of audit quality (i.e., factors leading to higher or lower quality) in section 2.2. I explain how auditor quality is lower or higher due to the influences of economic bonding and knowledge spillover via the provisions of NAS or APTS, while reputation protection and litigation avoidance mitigate the influences over auditor independence impairment when auditors are economically tied to their clients.

I review NAS research as it relates to audit quality in section 2.3. Overall, there are mixed findings as to whether NAS reduce audit quality, partly because NAS is composed of a variety of services with each having different and offsetting effects on

audit quality and because of the mitigating effects of reputation protection and litigation avoidance on reduced auditor independence. I discuss APTS research as it relates to audit quality in section 2.4. Although APTS studies are mixed, many studies support the conclusion that APTS does not reduce audit quality and more recent studies report an increase in audit quality as a result of APTS. There is relatively limited literature support for knowledge spillover related to APTS. There is also a gap in the literature as to how the PCAOB 2006 restrictions on tax services affect the relation between APTS and audit quality, and more specifically if the restrictions increase audit quality for companies that practice aggressive tax avoidance—the target of the restrictions.

I review the literature on the effect of APTS on tax avoidance in section 2.5.

Studies find a reduction in tax avoidance related to not purchasing APTS, suggesting that knowledge spillover from audit to tax results in tax savings. I review the literature on the determinants of and reduction in APTS in section 2.6. Finally, I conclude in section 2.7.

## **2.1 Regulatory Background**

Regulators are scrutinizing company tax practices and in particular companies practicing aggressive tax avoidance. The SEC and PCAOB are concerned that “the tax services and products that audit firms provide to their clients and to senior executives of those clients, including extremely aggressive, if not abusive, tax strategies may, by their nature, impair the objectivity of the auditor” and result in a favorable audit judgment for the client (PCAOB 2004, p. 5). The IRS is interested because APTS can lead to aggressive tax avoidance. The SEC Revision of Independence Requirements was part of a series of regulations meant to increase audit quality. Following the highly publicized downfall of Enron, WorldCom and other public companies, and the demise of

Arthur Anderson, the concerns of investors and regulators heightened over reduced auditor independence and its link with NAS. These concerns led to SOX and a series of other rules and regulation changes.<sup>3 4</sup> Although SOX and the other regulations were meant to increase auditor independence and NAS transparency, the PCAOB 2006 restrictions are the first to specifically restrict APTS and followed the exposure of tax shelter abuses by accounting firms, including the KPMG criminal tax shelter fraud, which increased regulatory scrutiny over accounting firm tax services.

The earliest relevant change in NAS regulation is meant to restrict some NAS and to increase investor information by disclosing NAS fees. The rules set forth by the SEC Revision of Independence Requirements (SEC 2000) limit the circumstances under which a company's audit firm provides financial system and information design implementation (FISDI), limit internal audit fees and require disclosures for audit fees, FISDI fees, audit-related fees, and other NAS fees. The requirements are meant to provide outsiders the information needed to monitor the magnitude of audit and NAS fees paid to an auditor by a company.

Although the SEC 2000 requirements limited some NAS and required additional NAS disclosures, the prohibition of most NAS did not occur until SOX. APTS were

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<sup>3</sup> Herrick and Barrionuevo (2002), for the Wall Street Journal, write that critics argued that "auditors are reluctant to question their big clients' books too much because they earn such large fees, not just for the auditing work but for nonaudit services, such as consulting. Enron paid Andersen \$27 million for nonaudit services, including tax and consulting work, compared with \$25 million for audit services, making Enron one of its biggest clients. [We would marvel at the amounts of money we were spending] with Andersen, says a former Enron analyst, whose job was to streamline costs."

<sup>4</sup> Kaiser (2002), for the Chicago Tribune writes that in 2001, "WorldCom paid Andersen \$4.4 million in audit fees and an additional \$12.4 million for other consulting services, according to a WorldCom regulatory filing."

specifically not banned by SOX, but it did ban audit firms from providing any FISDI, internal audit, and certain other services to their audit clients. This was done to increase audit quality by eliminating the economic bond created by some NAS. SOX effectively banned most consulting services, the service most likely to impair auditor independence, as evidenced by the Enron scandal. SOX also effectively transfers audit oversight to the audit committee by requiring them to preapprove all allowed NAS. Furthermore, the audit committee cannot approve NAS that include services where the auditor audits their own work, functions as a part of management, or serves as an advocacy role for the audit client. SOX had a significant impact on restricting NAS and consulting in particular.

Although SOX did not ban APTS, there is still much debate over if and how APTS affect audit quality. With the restriction of most NAS by SOX, APTS were the only significant NAS still permitted. Because investors and regulators were anxious to increase transparency of NAS, the SEC required separate disclosure of APTS fees beginning in 2003. Prior to this time, the SEC did not require separate disclosure, although some companies did voluntarily provide this information. Research reveals that APTS fees and the number of firms purchasing APTS gradually declined in the post-SOX period due to increased scrutiny over audit quality related to APTS by investors, audit committees, and regulators (e.g., Maydew and Shackleford 2007; Bedard et al. 2010).

In 2006, additional regulation narrowed the type of tax services accounting firms could provide their audit clients. The KPMG criminal tax shelter fraud was exposed during 2003.<sup>5</sup> During the investigation into the fraud, regulators learned that some audit

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<sup>5</sup> A 2005 Internal Revenue Service (IRS) press release noted that nine individuals are being criminally prosecuted in relation to the KPMG multi-billion dollar criminal tax fraud conspiracy, the largest in history. The fraud is related to creating, marketing and selling tax shelters. Although the fraud is not related to APTS or NAS, it led the SEC to investigate the aggressive tax practices of accounting firms.



firms were selling contingent fee based aggressive tax services to their audit clients. The PCAOB was created by SOX to oversee the audits of public companies in order to protect investors and the public interest by promoting informative, accurate, and independent audit reports. In December 2004, the PCAOB proposed rules which addressed regulator concerns about reduced auditor independence when auditors market or provide opinions in support of aggressive tax shelter schemes and in selling personal tax services to executives who have financial statement responsibility. In 2006, the SEC approved the PCAOB 2006 restrictions limiting tax services and prohibiting contingent fees. More specifically, rule 3522 states that a “registered public accounting firm is not independent of its audit client if the firm, or any affiliate of the firm, during the audit and professional engagement period, provides any non-audit service to the audit client related to marketing, planning, or opining in favor of the tax treatment of either a confidential or aggressive tax position transaction” and the aggressive tax position cannot be a recommendation, directly or indirectly (PCAOB 2006, p. 57-58).<sup>6</sup> The PCAOB also considers that an accounting firm lacks independence from a client if the firm charges that client contingent fees (rule 3521) or provides tax services to executives, or their family, who have financial statement oversight responsibility (rule 3523). In effect, the PCAOB 2006 restrictions banned aggressive APTS.

According to Lennox (2016), the APTS industry suffered a significant decline in both APTS fees and the number of firms purchasing APTS as a result of the PCAOB 2006 restrictions. There was a realignment of tax service providers and companies as tax

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<sup>6</sup> The PCAOB, rule 3522, defines an “aggressive tax position” as one where tax avoidance is the main purpose of the plan and is less likely than not to be allowed under applicable tax law.

service fees did not decline (Maydew and Shackelford 2007). Many APTS purchasing companies were affected by the restrictions. The reduction in APTS consist of companies that, prior to the reduction, aggressively avoided taxes and companies that did not aggressively avoid taxes but reduced APTS because of reputational costs and the heightened regulatory scrutiny over APTS. Since the PCAOB 2006 restrictions prohibit accounting firms from providing tax aggressive planning to their audit clients, companies wishing to receive legal tax aggressive services either changed their tax provider or auditor. Other companies that reduced APTS did so, whether they were aggressive or not, to signal high audit quality (Cripe and McAllister 2009). This was especially so for companies that are sensitive to the publicity surrounding the link between APTS aggressive tax planning and reduced audit quality. Tax services mainly consist of tax planning and tax compliance. Some firms eliminated the tax planning portion of APTS, but kept compliance, while other firms eliminated all APTS because combining tax planning and compliance services is more efficient as prior tax planning knowledge is reflected in current tax return preparation. The additional elimination of APTS compliance services contributed to the significant decline in APTS fees. The response by companies to the PCAOB 2006 restrictions was to reduce or eliminate APTS. Although this was the intent of the restrictions, the goal was to increase audit quality. Since this goal assumes that APTS reduce audit quality, the effectiveness of the restrictions is still unknown.

Financial Interpretation 48 (FIN 48)<sup>7</sup> increases the value of knowledge spillover related to aggressive APTS and together with the PCAOB 2006 restrictions promotes the

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<sup>7</sup> FASB interpretation No. 48 (FIN 48), Accounting for Uncertainty in Income Taxes – an interpretation of FASB statement No. 109.

de-coupling of audit and aggressive tax services. FIN 48, an interpretation of FAS 109, Accounting for Income Taxes, became effective in 2007 for publicly traded entities and is intended to provide improved guidelines in addressing uncertain tax benefits (UTBs). A UTB is based on a tax position taken in current or prior tax returns and represents the upper range of tax uncertainty, as FIN 48 requires any tax position with a 50% or less chance of being accepted by the IRS to be disclosed as a UTB liability. Because the estimation of UTBs are difficult and require extensive judgement, knowledge spillover created by APTS increases the quality of the UTB estimate. This is consistent with Ciconte et al. (2015) who find that APTS improves the quality of the estimates of UTBs and thus improves audit quality.

Cripe and McAllister (2009) report that 18% of CFO's who responded to a survey indicated that the decision to eliminate APTS was a decision of their accounting firm. The definition of tax aggressiveness under the PCAOB 2006 restrictions and the definition of a UTB under FIN 48 are similar. Under the PCAOB 2006 restrictions, an aggressive tax position is one that is less likely than not, or less than a 50% chance, to be upheld by the IRS, whereas, under FIN 48 it is one that has a 50% or less chance of being upheld by the IRS. Therefore, unless the chance of being upheld by the IRS is 50%, an accounting firm client discloses a UTB and also purchases APTS must not have recommended, directly or indirectly, the aggressive tax position transaction that led to that UTB and the main purpose of the position cannot be tax avoidance to be in compliance with both FIN 48 and the PCAOB 2006 restrictions. Because of the increased litigation and noncompliance risk to accounting firms that provide APTS, some accounting firms decreased or eliminated APTS to some or all clients. Although the

requirement to report a UTB was already in place by FAS 109, Accounting for Income Taxes, FIN 48 clarified the requirement and thereby not only increased the need for knowledge spillover from APTS, but also provided additional incentive to accounting firms of tax aggressive companies to de-couple tax and audit services.

To summarize, due to concerns that the provision of NAS compromises auditor independence, SOX prohibits NAS with the strongest threat to audit quality. Although APTS were not prohibited by SOX, the regulation quieted concerns about audit independence for only a short while. The investigation of the KPMG tax shelter fraud awakened concerns over the relation between reduced audit quality and APTS and led to the PCAOB 2006 restrictions on tax services that prohibit accounting firms from providing tax aggressive and contingent fee based services to their audit clients and personal tax services to audit client executives. Although APTS declined since SOX, a significant decline occurred during the years 2005-2006, which coincides with the PCAOB 2006 restrictions on tax services.

## **2.2 Economic Bonding vs Knowledge Spillover**

Research finds that the offsetting powers of economic bonding and knowledge spillover created when the same accounting firm provides both audit and NAS significantly influence audit quality. While economic bonding lowers audit quality, knowledge spillover increases it. The strength of the economic bond and the richness of the knowledge spillover determine which effect is more powerful and thus, whether the end result is an increase or decrease to audit quality.

The PCAOB and other regulators are concerned over the economic bond created between the auditing firm and client and the resulting potential decline in audit quality

when NAS are provided. An economic bond can be created by consulting and other NAS fees charged by the accounting firm. For Enron, Arthur Andersen earned more than \$52 million in 2000 and mostly from NAS (Abelson and Glater 2002). Also, Enron fees accounted for a large majority of the Houston Arthur Andersen office income, thereby making Enron an important client for the Houston office. Aside from the audit fees, the local office would also lose future NAS fees if Enron terminated their auditing service. The economic bond created the incentive to impair auditor independence and lower audit quality, and thus contributed to the demise of Enron and Arthur Andersen.

In a seminal paper, DeAngelo (1981) argues that incumbent auditors have the incentive to lower audit quality to preserve client specific future economic benefit. Although it can take many forms, the most commonly discussed client specific future economic benefit in literature are quasi-rents. As explained by DeAngelo (1981), quasi-rents are earned by incumbent auditors and generated by client specific start-up costs incurred with an initial audit. Although these costs are sunk, quasi-rents are considered an economic client specific benefit, like an asset. Once start-up costs are incurred they no longer need to be incurred again with the same client. If the start-up costs are large, so are the asset like quasi-rents. If the audit is terminated, the asset disappears as these costs must again be incurred with a new client. Thus, there is auditor incentive to sustain these future economic benefits.

Joint audit and NAS can also produce client specific economic benefits and, more importantly, a direct monetary benefit which can impair auditor independence. Since some NAS also require start-up costs, the accounting firm can earn asset like quasi-rents from NAS (Simunic 1984). Also, because of the relationship built between the

accounting firm and the client, often an audit client becomes a NAS client. NAS are generally more profitable than audit services and the fees can be high, which can strengthen economic dependency on the client. So, not only is the opportunity to provide NAS to an existing client an economic benefit, more importantly is the ability to generate additional and often high NAS fees. If a client terminates an audit engagement they may also terminate their NAS. The delivery of joint audit and NAS to a client can create a relationship where the accounting firm bonds or becomes economically dependent upon its client. This dependency creates a conflict of interest which can reduce auditor incentive to provide a high quality audit.

Client specific future economic benefits threaten auditor independence. The value of an audit lies in the market-assessed joint probability that an auditor will both (a) discover a breach in the client's accounting system and (b) report the breach (DeAngelo 1981). This probability is reduced when the auditor's independence is compromised. Auditor independence is key to producing a high quality audit (Mautz and Sharaf 1961) and is defined as the mental state of objectivity and lack of bias (SEC 2000). Since a client can threaten termination, they can apply pressure on auditors to reduce their independence by either not identifying or reporting a breach. Consequently, there is incentive by the incumbent auditor to lower their independence to retain the client and preserve the asset like client specific future economic benefit.

As in Arthur Andersen's relationship with Enron, they had much to lose if Enron terminated their audit services. Not only did Arthur Andersen make a significant amount of money from Enron, the NAS fees were larger than the audit fee, and the total fee comprised a large percentage of the total revenue of the Houston office. If Enron

terminated the audit, the Arthur Andersen Houston office would not only lose the audit and any asset like quasi-rents, but more importantly the lucrative NAS fees. Client economic importance at the local office level is more powerful than at a wider geographic area (Reynolds and Francis 2001). Studies suggest that it is the strength of the economic bond between the company and client that reduces auditor independence (DeAngelo 1981). Since the economic bond between Arthur Andersen and Enron was strong, the incentive to impair auditor judgment was also strong. In this case, audit quality became secondary, like the audit fees. Contingent fees also produce a strong economic bond because they are owed only if a pre-defined outcome occurs and by design, are extremely high. Therefore, both high and contingent based fees can result in a stronger economic bond and a stronger incentive to compromise auditor independence.

Nevertheless, it is important to note that several countervailing forces promote independence. Prior studies have shown that incentives from potential loss of reputation and increased risk of costly shareholder litigation can offset incentives from economic bonding (e.g., Reynolds and Francis 2001, DeFond et al. 2002; Larcker and Richardson 2004). As Reynolds and Francis (2001) argue, while the economic importance of a client can undermine audit independence at the local office level, larger, more influential clients also pose a higher risk of litigation. A questionable audit for a high-profile local office client with legal implications can have a significant negative impact to the reputation of the local office of an accounting firm. Using client importance as a proxy for economic bonding, Reynolds and Francis (2001) find an increase in audit quality for influential clients. More specifically, they find a negative relation between local office client importance and two proxies for audit quality, discretionary accruals and the likelihood of

the issuance of a going concern opinion. Their results show that reputation protection and litigation avoidance dominate any auditor incentive to reduce independence.

Alternatively, some researchers argue that NAS provide knowledge spillover that lead to improvements in audit quality. Simunic (1984) describes knowledge spillover as the efficiencies that can occur when joint services, with interdependent production functions, are provided by the same accounting firm. Because the production functions overlap, there is also an overlap of client specific knowledge. When this knowledge is shared, a synergy is created that increases the quality of one or both services. The spillover occurs simultaneously, flows in one or both directions and is usually client specific (Simunic 1984). For example, an auditor must be aware of any client legal contingencies. A NAS provider may also have knowledge of any legal contingencies as a result of performing their job. Sharing this knowledge can increase both the auditor's and NAS provider's understanding of the client's legal contingencies. Consequently, the quality of both services may be higher than if this knowledge was not shared.

Spillover can also be industry specific, where industry best practices or the application of industry specific regulations can be shared. This kind of spillover is especially valuable in highly regulated industries, where specialization is necessary to perform quality work. Because a limited number of auditors and accounting professionals provide services to regulated industries, sharing this knowledge may improve audit quality more than in non-regulated industry.

Research suggests that a knowledge spillover between audit and NAS increases audit quality and that this increase offsets any decline in auditor independence caused by economic bonding (e.g., Kinney et al. 2004; Raghunandan et al. 2003; Ashbaugh et al.



2003; DeFond et al. 2002; Chung and Kallapur 2003; Larcker and Richardson 2004). Simunic (1984) argues that a knowledge spillover between NAS and audit services also generates overall costs efficiencies, or additional quasi-rents (De Angelo 1981). Even with these additional rents, literature still finds that knowledge spillover increases audit quality.

Audit quality benefits from knowledge spillover. Two different services provided by the same accounting firm and whose production functions overlap are considered joint products that will benefit from knowledge spillover (Simunic 1984). This joint provision of service is an opportunity for the tax provider and auditor to combine their expertise, share client and industry knowledge and eliminate duplication of effort. Although knowledge spillover occurs between NAS and audit, it may be stronger between audit and APTS because of their overlapping production functions. Both services require specialized knowledge, and because both financial standards and tax regulations permeate all company transactions and financial systems, both providers must have a thorough understanding of the client's whole business. This differs from other NAS, as some services only require an understanding of the specific portion of the business directly related to the service provided. For example, a NAS engagement to improve a portion of a cost system may only need to understand the system and transactions related to that system. Therefore, knowledge spillover between APTS and audit may be stronger than between NAS and audit, and this strength may result in higher quality work.

Communication between the audit team and APTS is key to knowledge spillover and is more likely to occur under APTS than between the audit team and a tax service provider not from the same firm as the auditor (non-APTS) because of the lack of legal

liability and close physical proximity. An audit firm will hesitate to supply information to non-APTS due to liability reasons, just as non-APTS will hesitate to provide information to the audit firm. The audit and tax teams often share the same office location thereby making physical meetings or discussions easier under APTS. If both services are provided by one firm, there is easy access to personnel and work papers to and from either side without liability concerns. This allows the sharing not only of work papers but of client specific knowledge and expertise.

Auditors responsible for auditing the tax accounts often have strong tax knowledge and experience, but they can still benefit from knowledge shared from APTS. The benefit is stronger when the tax plan or position is complicated or aggressive. The client's tax strategy, how the tax law is applied to the client, and how this application currently affects and will affect future financial statements is valuable to both the auditor and tax provider. Also, auditors will have advance knowledge of any complications with the tax accounts and a better understanding of the tax contingencies of any UTBs. Therefore, if the audit firm does not also provide tax services, auditing the tax accounts and any UTB is more difficult and thus carries a higher risk of error, which leads to lower audit quality for companies not purchasing APTS.

### **2.3 The Relation between Non-Audit Services (NAS) and Audit Quality**

Studies on the effects of NAS on audit quality are largely motivated by the regulatory attempts to limit economic bonding by reducing NAS provided to audit clients in the early 2000s. Although findings are mixed, several studies find a positive association between NAS and proxies for low audit quality (e.g., Frankel et al. 2002; Ferguson et al. 2004), while others studies find either no systematic evidence supporting

the claim that auditors violate their independence (e.g., Kinney et al. 2004; Raghunandan et al. 2003; Ashbaugh et al. 2003; DeFond et al. 2002; Chung and Kallapur 2003) or positive associations between NAS and proxies for audit quality (e.g., Larcker and Richardson 2004). Most NAS studies find that NAS are not related to impaired auditor independence.

Both Frankel et al. (2002) and Ferguson et al. (2004) find that NAS is related to reduced auditor independence. Frankel et al. (2002), using data from 2001, find that NAS are positively related to small earnings surprises and the level of discretionary accruals and Ferguson et al. (2004), using 1996-1998 data from the United Kingdom, find that NAS are positively related to financial statement restatements and the level of discretionary accruals. Frankel et al. (2002) use the NAS fee ratio, audit firm NAS fee rank, audit fees and total fees as alternative proxies for NAS. Ferguson et al. (2004) use the NAS fee ratio, the logarithm of NAS, and the audit firm NAS fee rank to represent NAS.

The finding from Frankel et al. (2002) that NAS is related to auditor independence impairment has been criticized by many, including Ashbaugh et al. (2003) who argued that the total ratio (audit and NAS fees/total fees) is a better measurement of economic dependence than the fee ratio (NAS fees/total fees) used by Frankel et al. (2002). Ashbaugh et al. (2003) used data from 2000 and both discretionary accruals and the likelihood to meet or beat analyst benchmarks as a proxy for reduced auditor independence. After controlling for within-industry company performance and using the total fee ratio as a proxy for NAS, Ashbaugh et al. (2003) report no reduction in auditor independence impairment related to NAS fees.

Kinney et al. (2004), Raghunandan et al. (2003), and Chung and Kallapur (2003) report no reduction of auditor independence related to NAS fees. Kinney et al. (2004) specifically investigates certain NAS prohibited by the SEC in 2000 and finds no significant positive relation between either FISDI or internal audit fees and restatements, their proxy for audit quality. Their study is unique in that it uses pre-disclosure NAS fee data, 1995-2000, obtained from the largest seven U.S. auditing firms. Because the data is prior to any significant publicity on NAS fees and reduced auditor independence, it does not reflect behavioral changes caused by such publicity (Kinney et al. 2004).

Raghunandan et al. (2003) use data from 2000-2001 and also use restatements to measure audit quality. They develop a benchmark fee ratio by predicting it based on determinants of NAS fees and determine the unexpected portion by comparing a company's ratio to the benchmark. In addition, they use a group of companies that did not restate during the sample period as a control group. They find that the association between the unexpected NAS fee ratio and restatements does not differ between the control or restatement group, indicating that NAS do not reduce auditor independence.

Chung and Kallapur (2003) use abnormal accruals as a proxy for reduced auditor independence, local client importance measures to proxy economic bonding and data from 2001. More specifically, they use the NAS fee ratio and NAS fees divided by local office total fees to proxy for NAS, because studies show that fee importance at the local office level is a better proxy for economic bonding than at the national office level (e.g. Reynolds and Francis 2001). Even after partitioning their sample using proxies to represent size, strength of corporate governance, auditor expertise, client opportunity to manage earnings and client incentives to manage earnings so to test where reduced

auditor independence is most likely to occur, Chung and Kallapur (2003) did not find evidence of a reduction in auditor independence associated with NAS.

Other studies indicate that firm and personal reputation protection and litigation avoidance provide powerful incentives to reduce impaired auditor independence related to NAS. Using two client importance measures, three different accrual proxies for audit quality and data from 2000-2001, Larcker and Richardson (2004) find a positive association between NAS and audit quality. They measure client importance by scaling both audit fees and total fees by total revenues earned by the auditor at the local firm level. A cluster analysis determined that companies with the strongest audit quality have weak governance as indicated by low market capitalization, high growth prospects, less independent boards, low institutional holdings, and high insider holdings. Because weak governance should be an indicator of low financial statement quality, it appears the auditor plays a “key role in governance” by increasing audit quality to offset pre-audit low financial statement quality (Larcker and Richardson 2004, p. 627). Although the accounting firm has a financial interest or bond which can lead to auditor independence impairment, the threat of legal and reputational costs will motivate the auditor to reduce accruals and increase audit quality.

Using the logarithm of NAS fees, the logarithm of audit fees and the NAS fee ratio as proxies for NAS, DeFond et al. (2002) find no association between auditor independence impairment when NAS are purchased and cite auditor reputation protection and litigation avoidance as the reason for their finding. They use the propensity to issue a going concern opinion to a pre-defined distressed firm to measure auditor independence.

Thus, DeFond et al. (2002) suggest that reputation protection and litigation avoidance offset any incentive to reduce auditor independence.

Both Larcker and Richardson (2004) and Defond et al. (2002) take their sample from the year 2001, when the Enron and Arthur Andersen failure was fresh in investor and regulator minds. Because accounting firms were under scrutiny, auditors were motivated to protect their reputation and avoid costly litigation. This suggests that auditor reputation is most important when scrutiny is high.

Most NAS studies focus on testing the impairment of auditor independence related to the low level of NAS fee detail made available in 2000 by the SEC (SEC 2000) and find mixed results. NAS is comprised of consulting, APTS, FISID, and other types of NAS and each service provides its own incentives and effects on audit quality. These separate effects are blended when testing total NAS fees and can be the reason for mixed results. With the separate disclosure requirement of APTS fees by the SEC in 2003 (SEC 2003, it gave researchers the ability to separately examine APTS.

#### **2.4 The Relation between Auditor Provided Tax Services (APTS) and Audit Quality**

Findings are generally mixed regarding the effect of APTS on audit quality. Research provides limited evidence that knowledge spillover leads to fewer accounting and tax-related restatements, fewer material weaknesses in internal control, more accurate and adequate tax reserves, and less earnings management in tax expense (e.g., Kinney et al. 2004; De Simone et al. 2015; Gleason and Mills 2011; and Seetharaman et al. 2011; Lisic 2014), whereas some researchers do not find a significant association of APTS with discretionary accruals, non-tax discretionary accruals, misstatements and auditors' going-concern opinions (e.g., Cripe and McAllister 2009; Cook and Omer 2013; Lennox 2016).

On the other hand, other studies find that economic bonding leads to a higher propensity to meet or beat analyst consensus earnings targets, and lower tax accrual quality (e.g., Cook et al. 2008; Choudhary et al. 2015). Studies on APTS use many proxies to represent audit quality with limited success in finding a positive relation between APTS and audit quality.

#### 2.4.1 Increase in Audit Quality with APTS

Some studies support the knowledge spillover side of the debate by finding that APTS is related to increased audit quality (e.g., Kinney et al. 2004; Gleason and Mills 2011; Seetharaman et al. 2011), while recent research focuses on how and where APTS knowledge spillover occurs (e.g., De Simone et al. 2015). Kinney et al. (2004) use 1995-2000 private data obtained from the largest seven U.S. auditing firms and APTS fees scaled by the square root of total assets to proxy for APTS, following Simunic (1980), to linearize the relation between fees and size and thereby reduce size related heterogeneity. For larger and high APTS fee paying companies, Kinney et al. (2004) find a negative relation between APTS fees and restatements suggesting that knowledge spillover is more important for these companies because they have more complicated tax situations. Using data from 2000-2002 and for companies under IRS audit, Gleason and Mills (2011) investigate the difference between tax reserves of companies that did and did not purchase APTS. Also indicating knowledge spillover, they report that companies that purchase APTS had more accurate and adequate tax reserves. Using 2003-2005 data and both an indicator variable for APTS and the ratio of APTS fees scaled by total fees to proxy for audit quality, Seetharaman et al. (2011) find a negative relation between tax-related financial statement restatements and APTS, also indicating knowledge spillover.

De Simone et al. (2015) report that APTS increase audit quality through knowledge spillover related to internal control improvement that increases audit firm awareness of material transactions. More specifically, they find that APTS purchasing companies are significantly less likely to disclose a material weakness in internal controls and it is not due to economic bonding. When performing tax services, APTS may discover internal control weaknesses when calculating taxable income and share this knowledge with the audit side of the firm. De Simone et al. (2015) suggest that companies have more opportunity to timely improve their internal controls with APTS than with non-APTS because communication between the audit and tax side will detect and remediate<sup>8</sup> internal control weaknesses early in the engagement. Thus, tax knowledge spills over to the audit side and improves audit quality.

De Simone et al. (2015) also report that practitioners state that outside tax providers only focus on tax planning and reporting and fail to consider internal control risks or how tax schemes affect financial statement quality. Auditors acquire a thorough understanding of their client's operations, systems and controls that outside tax firms do not have and this knowledge is shared with APTS. Communication between the audit and tax team is key to knowledge spillover. Outside tax providers lack this shared knowledge of how transactions and controls interact to affect the quality of a client's financial statement. Thus, APTS have the unique advantage of knowledge spillover that outside tax providers do not have and leads to higher quality tax accounts and therefore, higher audit quality.

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<sup>8</sup> Auditor independence rules prohibit the auditor from assuming the role of management, however, audit firms can identify internal control risks, assess the design and effectiveness of internal controls, and communicate any issues with the client, without violating any independence rules.



#### 2.4.2 No Change in Audit Quality with APTS

Other studies find no change in audit quality (Cripe and McAllister 2009; Cook and Omer. 2013; Lennox 2016) when APTS are provided, which does not support the premise of regulators that APTS decrease audit quality. Using discretionary accruals to model audit quality, Cripe et al. (2009) find that when companies purchase non-APTS, there is no change in discretionary accruals compared to companies purchasing APTS. Therefore, they conclude that APTS does not impair auditor independence. They also find that both effective tax rates (ETRs) and audit fees are higher with non-APTS and thus, their findings support knowledge spillover which culminates in both cost and tax savings for the year the services are jointly provided. Using 2002-2005 data, non-tax discretionary accruals and restatements as proxies for audit quality and an indicator variable to represent the elimination of APTS, Cook and Omer (2013) find no change in audit quality for companies that changed to non-APTS. Using misstatement, tax-related misstatements, and going concern opinions as proxies for audit quality, Lennox (2016) finds no change in audit quality for companies that significantly reduced their APTS following the PCAOB 2006 restrictions.

#### 2.4.3 Compromised Audit Quality with APTS

Some APTS studies show that audit quality is compromised with APTS (e.g. Cook et al. 2008; and Choudhary et al. 2015). Using 2000-2004 data, Cook et al (2008) find a lower propensity to miss analyst earning targets associated with APTS than with non-APTS, indicating that APTS reduce audit quality. Using tax accrual quality (Choudhary et al. 2016) as their proxy for audit quality, Choudhary et al. (2015) report that estimation error in income tax expense is higher for companies purchasing a large

amount of APTS and suggest reduced auditor independence as the reason. More specifically, they find in-group identification, not economic bonding as the reason for their results. In-group identification is a cognitive bias which results in reduced auditor independence when reviewing work performed by someone in one's same group or firm (Wilson and Sherrell 1993). This may occur when APTS consist of assisting the client's tax department in the implementation of FIN 48 and the auditor then reviews the client's work, which is indirectly the work of APTS. Because it was implemented by a tax professional from the auditor's own accounting firm, the auditor may be less skeptical than if the work had been performed by a tax professional from another firm and thus, are less independent (Maydew and Shackelford 2007; Joe and Vandervelde 2007).

#### 2.4.4 Determinants of Voluntary Disclosure of APTS

Omer et al. (2006) and Bedard et al. (2010) find that political costs, tax attributes, auditor relationship, type of ownership, and strength of corporate governance and magnitude of NAS fees are among the determinants of companies that chose to voluntarily disclose APTS fees prior to the 2003 mandated disclosure date. This is consistent with companies attempting to avoid tax service scrutiny by the SEC, IRS and investors. Omer et al. (2006) find that the decision to voluntarily disclose is positively related to tax complexity, auditor tenure, and lower NAS fees. Bedard et al. (2010) suggest that political costs related to heightened regulatory scrutiny by the SEC and the IRS are the reason for companies to not voluntarily report APTS amounts and find that as NAS fees increase, the likelihood of reporting APTS fees decrease, and these results are magnified for companies with strong audit committees and non-Big 4 accounting firms. Bedard et al. (2010) further report that the decision to disclose is also positively related to

larger companies with institutional ownership and negatively related to deferred taxes, firm profitability, and auditor change. Overall, studies on the determinants of voluntary APTS fee disclosure find that companies voluntarily choosing to disclose have more complicated taxes, longer auditor tenure, lower NAS fees in relation to total fees and larger institutional ownership compared to companies choosing not to disclose, and suggest they did not disclose because of the political costs related to tax service scrutiny by the SEC and IRS.

#### 2.4.5 Impact of the PCAOB 2006 Restrictions

There is a shortage of studies that investigate the impact of the PCAOB 2006 restrictions on the relation between APTS and audit quality. Most APTS literature explore the relation between audit quality and APTS over the few years immediately after SOX or a large span of years since SOX. I am aware of only one study, Lennox (2016), which investigates the effectiveness of the PCAOB 2006 restrictions. The study of these restrictions are important because they are the first to specifically restrict APTS. There was a significant decline in APTS immediately prior to the effective date of the PCAOB 2006 restrictions and this decline provides a natural environment to test the association between APTS and audit quality. My study fills the gap in research by investigating whether the restrictions accomplished the intentions of regulators— to increase audit quality for companies that purchase APTS and for the specific target of the PCAOB 2006 restrictions, companies that also practice aggressive tax avoidance.

Lennox (2016) argues that since regulators assume that APTS reduce audit quality, when a company reduces or eliminates APTS, their audit quality should increase. In an event study using a difference-in-difference research design, Lennox (2016) finds

no difference in audit quality between the companies that significantly reduced and those that did not significantly reduce APTS during the period surrounding the implementation of PCAOB. Thus, his findings suggest that APTS do not decrease audit quality.

#### 2.4.6 Audit Quality Measures

Researchers use various proxies to measure audit quality including both non-tax and tax-related measures. Accounting financial statement restatements (e.g., Lennox 2016; Kinney et al. 2004; Seetharaman et al. 2011; Ferguson et al. 2004; Raghunandan et al. 2003), internal control weaknesses (e.g., De Simone et al. 2015), going concern opinions (e.g., Lennox 2016; DeFond et al. 2002), meet or beat analyst earnings (e.g., Ashbaugh et al. 2003; Dwaliwal et al. 2004), and discretionary or abnormal accruals (e.g., Ashbaugh et al. 2003; Chung and Kallapur 2003; Reynolds et al. 2004; Larcker and Richardson 2004; Cripe and McAllister 2009; Ferguson et al. 2004) are used as non-tax proxies for audit quality.

Tax-related proxies isolate the service overlap of the auditor and tax provider, therefore, they are naturally better than non-tax proxies to capture the effects of APTS on audit quality. Tax-related financial statement restatements (e.g., Lennox 2016; Seetharaman et al. 2011), tax reserves/UTBs (e.g., Gleason and Mills 2011), and earnings management via income expense accounts (e.g., Lisic 2014; Dwaliwal et al. 2004; Cook et al. 2008), are used as tax proxies to represent audit quality.

While several tax-specific measures are used by researchers to capture the experience and knowledge spillover between tax and audit, few studies examine the quality of income tax accruals. A firm's tax accrual (the difference between income tax expense and income tax cash flow) is complex, important, and significant. It involves

complicated judgment in the application of tax-related GAAP and includes numerous changes in balance sheet accounts such as income taxes payable, deferred tax assets, deferred tax liabilities, the valuation allowance, and unrecognized tax benefits (Choudhary et al. 2016). Also, the tax accrual affects the estimate of income tax expense, which is approximately 25-35% of a firm's pre-tax income. Furthermore, the SEC and other regulators pay close attention to the reporting of income taxes. Following FIN 48, FASB added two accounting for income taxes projects to its agenda in 2014 (Ernst and Young 2014). In addition, according to Usvyatsky and Whalen (2014), income taxes were the most frequently mentioned comment in SEC letters in 2013. These four combined factors highlight the complexity, importance, and significance of income tax accrual quality.

Since the tax return is completed after the completion of the financial statements, the tax accrual is estimated for financial statement purposes. This estimation process requires significant knowledge and judgment in a complex financial reporting area. Financial reporting for taxes requires applying tax rules to a firm's specific facts and circumstances and applying technical knowledge regarding how GAAP-based income and taxable income articulate. A recent survey shows that over 25% of responding companies reported using over 30 spreadsheets to calculate their income tax provision (Grant Thornton 2013). Consequently, the audit firm's assessment of the tax account reflects the product of joint work by audit and tax professionals, as the task requires a deep understanding of both tax-related GAAP and the tax law that surrounds firms' various tax strategies (McGuire et al. 2012).

Choudhary et al. (2016) develop a measure of tax accrual quality to capture variation in the extent to which the income tax accrual (difference between income tax expense and tax cash flow) maps into income tax-related cash flows. Choudhary et al. (2016) report that low tax accrual quality captures both intentional and unintentional management estimation error in tax-related accounts and differences between financial reporting standards and tax regulations not captured by the deferred tax accounts (GAAP-induced mismapping). They find that their tax accrual quality measure is associated with “firm characteristics that capture GAAP-induced mismapping and management estimation error in the application of tax related GAAP, both of which reduce the ability of tax expense to reflect a firm’s underlying tax obligation” (Choudhary et al. 2016, p 38). Although the quality of the income tax accrual (an area where the tax and auditing functions overlap) is interesting to study, evidence on the association between tax-specific attributes of the auditor and tax accrual quality is relatively scarce and requires more investigation (Choudhary et al. 2016).

#### 2.4.7 APTS Measures

Studies use various APTS fee based proxies to represent APTS with mixed findings. Gleason and Mills (2011) and Lennox (2016) use the presence of APTS, Choudhary et al. (2016), Choudhary et al. (2015), Seetharaman et al. (2011) and Cook and Omer (2013) use APTS fees scaled by total fees, Kinney et al. (2004) scale APTS by the square root of total assets, while Bedard et al. (2010) and Albring et al. (2014) use the tax fee ratio of APTS scaled by audit fees, and Omer et al. (2006) and Lisic (2014) use the logarithm of APTS fees. The proxies are intended to measure either the presence or magnitude of APTS, or the priority of APTS in relation to total or auditing services.

Scaling APTS fees by the square root of total assets or using the logarithm of APTS corrects for the heterogenous effect of company size. Overall, there is variety of APTS fees used to proxy for APTS in research.

## **2.5 The Effect of APTS on Tax Avoidance**

Although APTS have declined since 2000, companies still purchase these controversial services because research indicates it reduces taxes through knowledge spillover (e.g., Omer et al. 2006; McGuire et al. 2012; Cook and Omer 2013). Studies show that because knowledge spillover between audit and APTS is at the intersection of tax planning and tax account reporting, each service contributes to the combined understanding of how a tax strategy affects the financial statement. Tax avoidance is viewed from both a tax and financial statement perspective, because how a tax reduction strategy translates into tax expense in the financial statements is a function of both tax law and Generally Accepted Accounting Principles (GAAP) (Maydew and Shackelford 2007).

The calculation of taxable income and net income before taxes use two different sets of rules and is complex, therefore it requires strong tax, GAAP and client specific knowledge to effectively reduce taxes and properly estimate the tax accounts. Because the tax return is prepared in accordance with the Internal Revenue code (IRC) and financial statements in accordance with GAAP, a transaction may have different treatments, one for the tax return and one for financial statements. Therefore, there is likely to be a difference between taxable income and net income before taxes for financial reporting purposes. A portion or all of this difference is captured in the tax accrual. A book effective tax rate (ETR) is essentially the tax expense reported in the

financial statements divided by pre-tax income, while cash ETR is the IRC statutory rate used to compute the tax due in the tax return. Some companies focus on financial statements, increasing net income and reducing book ETR, other companies focus on the tax return, reducing taxes due and on cash ETR, while still other companies will try to manage both perspectives and rates. Because the application of both tax regulations and GAAP is complex and companies have varying tax versus financial statement priorities, the overlap in audit and APTS will affect both tax account quality and tax rates.

Research indicates that joint expertise and knowledge spillover can improve tax planning and thus reduce both cash taxes paid and the tax expense reported in the financial statements. Omer et al. (2006) find higher ETRs for companies choosing to reduce or eliminate their APTS, suggesting the new tax provider lacks client specific knowledge which the previous provider obtained through knowledge spillover and tenure. McGuire et al. (2012) find when audit and tax teams combine their expertise, the result is both lower cash ETRs and book ETRs than if the teams were not experts. Particularly with complex tax situations, it can be difficult to develop a long-term tax strategy that maximizes the benefit from both the tax and financial statement perspective. With APTS, tax and audit experts combine their knowledge to develop tax strategies that can fully benefit both perspectives.

Cook and Omer (2013) find that a company's decision to eliminate APTS was costly as both book and cash ETRs increased in the year after eliminating or substantially reducing APTS. Furthermore, they find no evidence of a reduction in auditor independence, as indicated by no difference in discretionary accruals and no change in the likelihood of a restatement following the shift. This suggests that a new tax provider



lacks firm specific knowledge. Overall, their findings support knowledge spillover which effectively provided better tax planning.

Although the PCAOB 2006 restrictions prohibit APTS from recommending tax aggressive positions, companies will continue to purchase APTS to reduce their tax rates. A knowledge spillover reduces the complexity in applying the tax code and GAAP to client transactions and therefore, will reduce tax rates.

## **2.6 Determinants of and Reduction in APTS**

There are a group of studies that investigate the SOX requirement that company audit committees must preapprove NAS by examining the characteristics of boards and companies that approve APTS and suggest that companies are sensitive to the perception of financial statement quality. Bedard and Pacquette (2010) report that accounting financial experts are less likely to approve APTS than other committee members, while they do not find the same results with non-accounting financial experts. In addition, any APTS approved by accounting financial experts are at a lower level than for audit services and they find that directors who hold more directorships approve less amounts of APTS, which suggests these directors have reputational concerns. Albring et al. (2014) find that board accounting expertise, not general financial expertise, and strong corporate governance decrease the likelihood that the company will purchase APTS. More specifically, they find that companies with more independent boards, higher stock ownership by directors and institutions, separate CEO and chairman positions, and higher tax/audit fees are more likely to change to non-APTS. Institutional ownership can carry power as the California Public Employee Retirement Fund has “cast thousands of proxy

votes in opposition to directors who think it's okay to allow an auditor to also be a consultant" (PCAOB 2004, pg. 9).

Some studies report a reduction in APTS since 2000 and a significant reduction in APTS from 2005-2006, during the implementation period of the PCAOB 2006 restrictions because of concerns over reduced audit quality, in fact and in appearance, and increased regulatory scrutiny. Using data from 2000-2002, Omer et al. (2006) find that companies paying abnormally high audit and high APTS fees prior to SOX significantly reduced their APTS in response to the forthcoming SOX regulation. Maydew and Shackelford (2007) report a significant shift away from APTS to either an in-house tax department, another accounting firm, or to a non-accountant tax consultant between the years 2002-2004. They do not report a decline in tax fees paid or tax services because the tax practice of the largest accounting firms have not changed. At the same time, they find an increase in audit fees. As a result, the tax/audit fee ratio went from 1.0 in 2001 to .25 in 2004. Overall, they find evidence of a significant delinking of audit and APTS. Lennox (2016) also finds a significant change in APTS but over a different and shorter period of time, between 2005 and 2006. More specifically, he finds a 40.9% reduction in APTS fees and a 46.14% decline in the number of companies that purchased APTS from 2005-2006 and suggest it is a result of the PCAOB 2006 restrictions on contingent fees, tax aggressiveness, and executive tax services.

There is a large decline in APTS between 2000 and 2006, with a significant decline prior to the PCAOB 2006 restrictions, in 2005. This suggests that both companies and accounting firms are keenly aware of audit quality, both in fact and in appearance, and wish to avoid regulatory scrutiny.

## 2.7 Literature Summary

I review the long-standing debate about whether the provision of NAS impairs auditor independence and the development of U.S. regulatory prohibitions to limit economic bonding created by NAS and APTS. Although SOX is associated with a large reduction in APTS, the PCAOB 2006 restriction on tax services caused a sharp and significant reduction in APTS. I discuss economic bonding vs knowledge spillover as antecedents of audit quality (i.e., factors leading to higher or lower quality). I also discuss how knowledge spillover via the provisions of NAS (APTS), reputation protection, and litigation avoidance mitigate the influences over auditor judgment when auditors are economically bonded to their clients. Overall, there are mixed findings as to whether NAS reduce audit quality, partly due to the offsetting effects of reputation and litigation avoidance on reduced auditor independence, and because NAS are composed of a variety of services, including APTS, with each NAS having their own set of characteristics. Overall, studies support the conclusion that APTS is not related to reduced audit quality but find weak evidence that APTS is linked to an increase in audit quality.

There is a gap in the literature investigating the effects of the PCAOB 2006 restrictions on the relation between APTS and audit quality and in particular for tax aggressive companies, the target of the restrictions. Since the intention of the restrictions is to increase auditor independence and particularly for tax aggressive companies, missing are studies on whether these specific restrictions accomplished both goals. My study fills this void by investigating whether a significant reduction in APTS associated

with the PCAOB 2006 restrictions leads to increased audit quality, especially among companies that purchased aggressive tax services prior to the reduction.

## CHAPTER 3 HYPOTHESES

### 3.1 PCAOB 2006 Restrictions Effectiveness

During the investigation into the development and sales of abusive tax shelters by accounting firms, including the KMPG criminal tax shelter fraud, the General Accounting Office (Permanent Subcommittee 2005) (GAO 2005) learned that many accounting firms were selling contingent fee based aggressive tax services to their audit clients. The PCAOB is concerned that the economic bond created by joint audit and APTS, and in particular, high fee APTS, impairs auditor judgement (DeAngelo 1981). This concern extends to the quality of the tax accounts where both audit and APTS provide influence. If a company's tax obligations rely on a tax strategy developed by its audit firm, the provision of tax services could place the auditor in position of auditing its own work. Although reputation protection and litigation avoidance will reduce the economic bond, these effects may not be strong enough to offset it (e.g., Reynolds and Francis 2001; DeFond et al. 2002; Larcker and Richardson 2004). Therefore, the PCAOB 2006 restrictions prohibited accounting firms from providing contingent fee based and aggressive tax services to audit clients. The restrictions are meant to increase audit quality, and in particular, the quality of the tax accounts.

When companies purchase APTS they gain a knowledge spillover, which is related to increased audit quality (e.g., Kinney et al. 2004; De Simone et al. 2015; Gleason and Mills 2011; Seetharaman et al. 2011; Lisic 2014). A knowledge spillover

(e.g., Simunic 1984) arises when expertise, experience and firm-specific knowledge is shared between the tax and audit department when APTS are purchased. This will increase the quality and efficiency in which both audit and tax services are completed. The increase in audit quality from knowledge spillover may offset or exceed the reduction in audit quality created by economic bonding. Therefore, if companies do not purchase APTS, they lose the benefit of a knowledge spillover between the tax and audit departments. Thus, because the audit quality increasing effect of knowledge spillover is missing, the goal of the PCOAB 2006 restrictions of increased audit quality may not occur.

When a company significantly reduces APTS, any effect or power that economic bonding and knowledge spillover had on audit quality will also be significantly reduced. Thus, the significant reduction of both economic bonding and knowledge spillover will reveal which effect was strongest. If the power of economic bonding is stronger than the power of knowledge spillover, then the companies that significantly reduced APTS should have higher audit quality than the companies that did not significantly reduce APTS. This finding would indicate that APTS are associated with lower audit quality because of the economic bond between the accounting firm and its audit client. On the other hand, if the power of economic bonding is weaker than the power of knowledge spillover, then the companies that significantly reduced APTS will have lower audit quality than the companies that did not significantly reduce APTS. This would indicate that APTS are associated with higher audit quality because of knowledge spillover. This leads to my first hypothesis in the null form.

**H1: There is no difference in audit quality changes following the PCAOB 2006 restrictions between clients that significantly reduced APTS compared to clients that did not significantly reduce APTS.**

### **3.2 PCAOB 2006 Restrictions Effectiveness: Tax Aggressive Clients**

There are two groups of companies that significantly reduced APTS surrounding the PCAOB 2006 restrictions. The first group is not concerned with aggressive tax services because they do not practice that level of tax avoidance. This group still reduced their APTS primarily due to potential reputational concerns related to not changing (e.g., Bedard et al. 2010; Bedard and Pacquette 2010). The already heightened concerns of the PCAOB and other parties over the connection between APTS and auditor independence impairment and the scrutiny of the IRS over aggressive tax avoidance spiked with the investigation into tax shelters sold by KPMG and other accounting firms. It was discovered that accounting firms were supplying their audit clients with contingent fee based and tax aggressive services which could impair auditor independence. Companies in this group wanted to distance themselves not only from APTS, but particularly from KPMG, APTS and tax aggressive APTS (Finley and Stekelberg 2016). Therefore, the reduction or elimination of APTS mitigates all these concerns.

The second group consists of companies that practice various levels of aggressive tax avoidance and reduced their APTS because they chose to either no longer receive aggressive tax services from their audit firm or their audit firm chose to no longer provide aggressive tax services to them. Also, a company that occasionally takes an aggressive tax position may wish to purchase non-APTS so to have the option of taking an aggressive tax position in the future. The PCAOB 2006 restrictions directly affect how

much a tax aggressive company will pay in taxes by making them choose between tax aggressive non-APTS and non-tax aggressive APTS. The decision to purchase non-APTS is a decision to continue paying less tax and can easily be quantified into dollars that directly affect the bottom line. Since the PCAOB 2006 restrictions are specifically targeting companies purchasing tax aggressive services from their audit firm, my next hypothesis focuses on this group.

The combination of contingent fee based and aggressive tax services may create a stronger economic bond between the client and the accounting firm than for non-aggressive tax services. This stronger bond will lead to a stronger incentive to reduce auditor independence and may be the reason why Frank et al. (2009) reported strong evidence of a positive relation between aggressive tax and financial reporting. Tax avoidance or a low level of aggressive tax planning can equate to legal tax savings. As the level of aggressiveness increases so does the tax savings and the accompanying risk of not only repaying these savings plus penalties and interest to the IRS, but also bearing the costs of restating financial statements. Aggressive tax services lead to risky tax positions where the success of the position is contingent on either IRS approval or a passing of the statute of limitations. Often, for clients to take this risk, they agree to pay a high fee only if the plan is successful (a contingent fee). Because the risk and potential tax savings are high, so is the fee. These tax fees often dwarf the audit fees paid by that client to their accounting firm. Thus, an accounting firm may lose not only the audit fees, but also the lucrative contingent tax fees if that client terminates their service. Thus, the economic bond between them is strong. Some studies suggest that it is the strength of the economic bond between the company and client that reduces auditor independence (De



Angelo 1981). Therefore, because the economic bond is stronger for this group than for the group of companies that do not practice aggressive tax avoidance, so is the incentive to reduce auditor independence.

The PCAOB is also concerned that the reason behind a particular tax aggressive strategy or abusive tax shelter is to obtain a certain financial statement outcome. The special purpose entities which helped to bring down Enron “could be characterized as tax planning structures and obviously structures for affecting the shape of the GAAP financials of Enron” (PCAOB 2004, p. 105). If APTS are producing these results, then the company’s audit committee should not have approved this service as SOX specifically forbids NAS that result in the accounting firm auditing their own work. Combined with economic bonding, if accounting firms are auditing their own work, there is a significant risk of reduced audit quality.

Although the economic bond may be strong between aggressive tax service providers and their audit clients, so may be the incentive for accounting firms to protect their reputation. Because of the increased regulatory scrutiny over tax aggressiveness and APTS, accounting firms may take stronger measures to protect their reputations and decrease litigation. Many studies report that accounting firm reputation is a major consideration in a client’s decision to change or continue with an accounting firm. The reputation decline of Arthur Andersen, following Enron, and KPMG, following its acknowledgement of “unlawful conduct” connected with tax shelter fraud and the related deferred prosecution agreement, are just two examples. Arthur Andersen collapsed and Finley and Stekelberg (2016) report a significantly larger decline in APTS services for KPMG than for other big 4 accounting firms following the deferred prosecution

agreement. Reputation was especially important during and following the implementation of the PCAOB 2006 restrictions as there was a “chilling effect on the tax services” (Lennox 2016, pg 2) industry as 46% of APTS clients changed to non-APTS. Consequently, accounting firms competed for the tax services of companies seeking non-APTS. Scrutiny by the PCAOB and IRS, which led to the PCAOB 2006 restrictions, may provide accounting firms with strong incentives to protect their reputation and may offset or exceed any reduced auditor independence impairment related to economic bonding.

The loss of knowledge spillover related to the fee reductions may also have a stronger impact on audit quality for tax aggressive clients than for less tax aggressive clients. Although understanding the tax position of a client and estimating their tax accounts and unrecognized tax benefits (UTBs) has always been complex and therefore, difficult, accomplishing these tasks for a tax aggressive client is even more difficult (Donohoe and Knechel 2014). Because of this increased difficulty, audit risk is also higher for these companies. Studies show that tax account complexity and judgement errors are common reasons for tax misstatements (Donohoe and Knechel 2014). To reduce the elevated risk associated with aggressive tax positions, the auditor will consult with specialized tax professionals. If the company also purchases APTS, these internal tax specialists can not only share tax knowledge, but more importantly client specific knowledge of tax positions, tax planning and tax contingencies. This greatly increases the likelihood that the auditor can thoroughly understand each aggressive tax position and properly review the tax accounts, including any UTB. This is an example of powerful knowledge spillover, as it can have a strong impact on audit quality.

Consistent with the main target of the PCAOB 2006 restrictions, I examine tax aggressive companies who purchase APTS and how the relation between APTS and audit quality changes as APTS is reduced. According to the premise, audit quality should increase for tax aggressive companies that reduced APTS not only compared to tax aggressive companies that did not reduce APTS but more importantly for less tax aggressive companies that also decreased APTS. If the effects of knowledge spillover and reputation protection have more impact on audit quality than the effects of economic bonding, then audit quality will decrease more for tax aggressive companies that reduced APTS than for both tax aggressive companies that did not reduce APTS and less tax aggressive companies that also reduced APTS. Because the reduction in APTS could result in either an increase or decrease in audit quality, it is therefore an empirical question. Therefore, my hypotheses are in the null form.

**H2a: There is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and tax aggressive clients that did not significantly reduce APTS.**

**H2b: There is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and less tax aggressive clients that also reduced APTS.**

### **3.3 PCAOB 2006 Restrictions: Client Importance**

The effects of the PCAOB 2006 restrictions on audit quality are also unlikely to be equal among clients of different importance to the audit firm's tax revenue. It can be argued that economic bonding is stronger with large clients that are a significant source of audit firms' tax service revenue. Since aggressive tax practices lead to regulatory

concerns about the economic bonding between the client and the auditor, audit firms are more likely to reduce the provision of aggressive tax services to their most important tax clients.

Large, more important tax clients create an economic dependence that may cause auditors to compromise their judgement. Companies may pay a higher level of fees to maintain aggressive tax avoidance and can stem from high tax consulting service fees or contingent fees associated with tax aggressive APTS. Paying high fees, though, does not always lead to economic bonding. Kinney et al. (2004) find no reduction in auditor judgement resulting from lucrative NAS fees, therefore, an extremely high fee is merely a red flag which may lead to economic bonding. While the economic importance of a client, at the local firm level, may reduce auditor independence, auditors also face greater litigation risk with larger, more important clients and therefore, greater incentive for reputation protection (Reynolds and Francis 2001).

The economic importance of a client may also provide the incentive to increase audit quality and thereby strengthen the firm and auditor's reputation. The enhancement in audit quality can be accomplished by the auditor seeking more knowledge spillover from the auditor's tax department and will occur especially when a new or more complicated tax position is taken or a new tax-related financial regulation is implemented. Additional effort by both the auditing and tax department of the accounting firm is extended and aimed at increasing audit quality and more specifically, the tax accounts and disclosure. Studies find that tax aggressive companies that purchase APTS have increased audit fees related to implementation of FIN 48 (Donohoe and Knechel 2014; Erickson et al. 2015). Donohoe and Knechel (2014) find that companies

with low ETRs, compared to industry average, pay 6% more in audit fees than non-tax aggressive firms. FIN 48 is directly aimed at the reporting and disclosure of aggressive tax positions. This suggests that a significant amount of joint effort and knowledge spillover was needed to understand the complex tax positions and properly review the tax accounts and UTBs of these more important clients. Therefore, knowledge spillover is stronger for more important clients.

The PCAOB might have increased the scrutiny over the tax service relationship between accounting firms and their most important audit clients because of the relationship's incentive to reduce auditor independence created by its strong economic bond. This scrutiny is evidenced by the PCAOB 2006 restrictions. In particular, Rule 3520 of the restrictions requires audit firms to be independent of the firm's audit client throughout the audit and professional engagement period and Rule 3522 prohibits auditors from providing tax services involving aggressive tax positions to their audit clients. Although accounting firms enjoy the benefit created with knowledge spillover, they chose to decrease APTS to some of their most important clients in order to satisfy the independence criteria.

My third hypothesis investigates the effects of APTS for more important clients. When APTS is reduced for a more important client, both effects of knowledge spillover and impaired auditor independence will also be significantly reduced. Therefore, the change in tax accrual quality, my proxy for audit quality, will reveal which effect was strongest for this group of clients. An increase in tax accrual quality indicates that APTS for more important clients is related to stronger impaired auditor independence and a decrease in tax accrual quality indicates APTS for more important clients is related to

stronger knowledge spillover. Since increasing client importance can either improve audit quality through stronger knowledge spillover and reputation protection or reduce audit quality through stronger impaired auditor independence, I present my third hypothesis in the null.

**H3: There is no difference in audit quality changes following the PCAOB 2006 restrictions between local office important tax clients that significantly reduced APTS and local office important tax clients that did not significantly reduce APTS.**

## CHAPTER 4 RESEARCH DESIGN

My primary analysis focuses on the change in audit quality before and after companies significantly reduce their APTS purchases to determine if the PCAOB 2006 restrictions were effective in enhancing auditor independence and improving audit quality. To test the impact of the PCAOB 2006 restrictions, I compare the change in audit quality (captured by tax accrual quality) measured before and after the implementation period of the PCAOB 2006 restrictions (the event), for the group of companies that significantly reduced APTS (i.e., the treatment group) to the group of companies that did not significantly reduce APTS (i.e., the control group). I explain the implementation of the propensity score matching and introduce the group of companies that significantly reduced APTS in section 4.1. I define my proxy for audit quality, tax accrual quality, and explain why it may potentially be a better proxy than other proxies to capture the effects related to APTS that impact audit quality in section 4.2. I identify the pre-event, event, and post-event windows of the PCAOB 2006 restrictions in section 4.3. I present my main regression model in section 4.4, including the definition of tax aggressive companies.

### **4.1 Implementing the Propensity Score Matched Pair Design**

I use a propensity score matched pair design to match companies that significantly reduce APTS and companies that did not significantly reduce APTS on many dimensions. The propensity score method is more robust to a partial-matched econometric method that uses a small number of variables because it efficiently matches

on a number of dimensions (e.g., Armstrong et al. 2009; Lawrence et al. 2011). With matching models, a comprehensive set of company characteristics are used when estimating the propensity score. My propensity score model includes key variables that determine reduce companies and the control variables from my main regression, model(4).<sup>9</sup>

First, I create the treatment and control group of companies by defining a significant reduction in APTS as at least a 75% reduction during the event window (see definition in section 4.3). The following equation (1) determines the percentage decline in APTS and a significant reduction is the group indicator variable, reduce, that equals one 1 if %apts\_down is  $\geq 75\%$ , and zero otherwise.

$$\%apts\_down_{it} = \begin{cases} (apts_{it} - apts_{it-1})/apts_{it-1} & \text{if } apts_{it} < apts_{it-1}; \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

where APTS fees (apts) is the amount of APTS fees reported for company  $i$  in year  $t$ , and only for equation (1) and for defining the variable %othernas\_down does  $t$  represent the post-event window (see definition in section 4.3) and  $t-1$  the pre-event window (see definition in section 4.3). I use greater or equal to 75% as the cut-off to define a significant reduction which is consistent with Lennox (2016). APTS consists of both tax compliance and tax consulting, where tax consulting requires more judgement and is the area where tax planning occurs. If a company purchases both services, they are more apt to reduce consulting services first, therefore, I consider 75% a significant reduction that will capture any reduction in tax consulting services.

<sup>9</sup> Heckman (1979) models require the selection of company characteristics that only influence the first-stage regression and not the second-stage regression. In addition, prior research suggests that the Heckman model is very sensitive to small changes in model specifications (Lennox et al. 2012).



Second, I estimate a propensity score model for the probability that the company significantly reduced APTS while controlling for a number of key variables that represent other reasons for a significant reduction in APTS. Specifically, I estimate the following logistic model (equation (2)) prior to and after the event window (See appendix B for variable definitions):

$$\text{reduce}_{it} = \alpha + \beta_1 \ln \text{last\_apts}_{iy} + \beta_2 \% \text{othernas\_down}_{iy} + \beta_3 \text{size}_{iy} + \beta_4 \text{stk}_{iy} + \beta_5 \text{loss}_{iy} + \sum \text{proxy\_controls}_{it} + \text{industries}_{it} + \mu_{iy}, \quad (2)$$

where  $i$  denotes firm and  $y$  denotes year, respectively;  $\text{reduce}$  is the treatment group indicator variable that equals one 1 if  $\% \text{apts\_down}$  is  $\geq 75\%$ , and zero otherwise; the last APTS fees reported prior to the event ( $\ln \text{last\_apts}$ ) is the logarithm of APTS fees from the last financial statement in the pre-event window and is used to control for the magnitude of APTS fees prior to the restriction taking effect; the absolute percentage reduction of other NAS fees ( $\% \text{othernas\_down}$ ) equals the ratio of  $\left| (\text{othernas}_{it} - \text{othernas}_{it-1}) / \text{othernas}_{it-1} \right|$  if  $\text{othernas}_{it} < \text{othernas}_{it-1}$ , and 0 otherwise, to control for the possibility that companies eliminated all NAS to signal high quality financial statements (Maydew and Shakelford 2007);  $\text{size}$  is the logarithm of total assets to reduce the possibility that size related characteristics may influence the decision to purchase APTS; stock market ( $\text{stk}$ ) is an indicator variable that equals 1 if the stock is traded on an exchange, and 0 otherwise; and  $\text{loss}$  is an indicator variable that equals 1 if a net loss after taxes was reported, and 0 otherwise. I also control for year and industry fixed effects and include all control variables from my tax accrual/audit quality analysis ( $\sum \text{proxy\_controls}$ ; see section 4.4), except those redundant to the variables in estimating companies that significantly reduced APTS.

Third, I match the treatment to the control groups using the propensity scores develop in the prior step. Specifically, I identify matched company pairs based on the smallest co-variance difference between propensity scores.

#### 4.2 Measuring Tax Accrual Quality (taxaq)

The measure of audit quality used in analyses is tax accrual quality. Choudhary et al. (2016) develop a measure of tax accrual quality to capture variation in the extent to which the income tax accrual maps into income tax-related cash flows. The Choudhary et al. (2016) model is based on Dechow and Dichev's (2002) approach for estimating working capital accruals and estimates how well tax accruals map to tax-related cash flow. The tax accrual is estimated for financial statement purposes and prior to the completion of the tax return. Because this process requires much knowledge and judgement, low tax accrual quality (i.e., mismapping) can reflect management estimation error in tax-related accounts, and is shown to be associated with future tax-related restatements, internal control material weaknesses, and decreased earnings informativeness.<sup>10</sup> Following Choudhary et al. (2016), I use the following equation (Equation (3)) to estimate tax accrual quality:

$$\text{taxacc}_{cy} = \beta_0 + \beta_1 \text{ctp}_{iy-1} + \beta_2 \text{ctp}_{iy} + \beta_3 \text{ctp}_{iy+1} + \beta_4 \text{c\_dtl}_{iy} + \beta_5 \text{c\_dta}_{iy} + \varepsilon_{iy}, \quad (3)$$

where *i* denotes company and *y* denotes year, respectively; tax accrual (taxacc) is calculated by subtracting cash taxes paid (ctp) from total tax expense (tte). Cash taxes paid (ctp) for the lagged, current and lead years are used to assist in the mapping. The

<sup>10</sup> Low tax accrual quality can also be related to GAAP-induced mismapping rather than management estimation error. To address this possibility, the main regression (discussed later) control for GAAP-induced mismapping using two variables: employee stock options and non-articulating items (e.g., discontinued operations, extraordinary items, and other items reported net of tax on the income statement), in a manner similar to Choudhary et al. (2016).

change in the long term deferred tax liability ( $c\_dtl$ ) and long term deferred tax asset ( $c\_dta$ ) captures any temporary differences between tax and financial reporting. All variables are scaled by total assets and defined in detail in appendix B. A positive relationship is expected for lag and lead cash taxes paid ( $ctp_{y-1}$ ) ( $ct_{qy+1}$ ) and change in long term deferred tax liability ( $c\_dtl$ ), whereas a negative relationship is expected for cash taxes paid ( $ctp$ ) and change in long term deferred tax asset ( $c\_dta$ ).

Similar to Choudhary et al. (2016), I estimate Equation (3) using industry-year regressions from time period  $y-2$  through  $y$ , where industry is defined based on two-digit Standard Industry Classification (SIC) codes. I require a minimum of 20 observations per industry-year to estimate Equation (3). Then, I calculate  $taxaq$  as the standard deviation of the residuals from estimating Equation (3) during this three-year time window, multiplied by  $-1$ . As such, higher  $taxaq$  indicates better tax accrual quality (i.e., lower estimation error).

#### **4.3 Identifying Pre vs Post (post) PCAOB Restrictions Period**

I intend to capture the effect of the PCAOB 2006 restrictions on the relation between APTS and audit quality. The PCAOB announced the rules on July 26, 2005 and the SEC approved them on April 19, 2006. See appendix B for a list of the independence rules of the PCAOB 2006 restrictions and their effective dates. Rule 3521 of the PCAOB 2006 restrictions concerns contingent fees, while rule 3522 concerns tax services. Rule 3521 will “not apply to contingent fee arrangements that were paid in their entirety, converted to fixed fee arrangements, or otherwise unwound before June 18, 2006” (PCAOB 2006, pg. 2). Rule 3522 will not “apply to tax services or fee arrangements that were completed by a registered public accounting firm no later than June 18, 2006”

(PCAOB 2006, pg. 2). Rule 3523 prohibits an accounting firm from providing any tax service to a person in a financial reporting oversight role at the issuer audit client or an immediate family member of such person” and is effective after October 31, 2006 (PCAOB 2006, pg. 2). The audit client may pay for these executive tax services. Therefore, the last accrued APTS expense, under the old law, would be October 31, 2006. I expect any company tax provider changes, as a result of the new rules, would more than likely occur after July 25, 2005 throughout October 31, 2006 (Lennox 2016).

My primary analysis compares the change in audit quality over the one-year period before and after the significant reductions in APTS fees through the event window. More specifically, the timeline of my study is divided into the following three windows: 1) pre-event, which consists of fiscal years ending before July 26, 2005. Since mandatory disclosure of APTS fees began for fiscal years ending December 16, 2003, my pre-event begins no earlier than this date; 2) event, which consists of fiscal years beginning or ending in the period from July 26, 2005 through October 31, 2006 and 3) post-event (post), which consists of fiscal years beginning after October 31, 2006 (see Figure 1).

#### **4.4 Main Regression Model (4)**

For testing my hypotheses, I implement a difference-in-difference design and estimate the following baseline OLS model using matched companies (All variable definitions are listed in appendix B):

$$\begin{aligned} \text{taxaq}_{iy} = & \alpha_i + \beta_1 \text{reduce}_{iy} + \beta_2 \text{post}_{iy} + \beta_3 \text{reduce}_{iy} * \text{post}_{iy} + \beta_4 \text{size}_{iy} + \beta_5 \text{utb\_est}_{iy} + \beta_6 \\ & \text{eso\_ind}_{iy} + \beta_7 \text{foreign}_{iy} + \beta_8 \text{ptbi}_{iy} + \beta_9 \text{tax\_loss}_{iy} + \beta_{10} \text{disc}_{iy} + \beta_{11} \text{big4}_{iy} + \beta_{12} \text{kpmg}_{iy} + \\ & \text{industries} + \varepsilon_{iq}, \end{aligned} \quad (4)$$

where  $i$  denotes company and  $y$  denotes year, respectively. Its estimated coefficient ( $\beta_1$ ) represents the treatment group's tax accrual quality (taxaq) compared to the control group during the pre-event window. Given APTS are associated with both economic bonding and knowledge spillover, I provide no prediction of  $\beta_1$ . The coefficient ( $\beta_2$ ) of post captures the change in taxaq from the pre to the post-event window for the control group (benchmark). Because this group made no changes in APTS, a change in tax accrual quality is not expected and therefore, I provide no prediction of  $\beta_2$ . The coefficient ( $\beta_3$ ) for the interaction term (reduce\*post) tests hypothesis one and represents the change in taxaq from the pre-event to the post-event window for the group of companies that significantly reduced APTS (the treatment group) compared to the group of companies that did not significantly reduce APTS (the control group).

Following Choudhary et al. (2016), I control for a number of variables that have been shown to be associated with tax accrual quality, I control for their effects: size is the logarithm of total assets; utb\_est is the predicted value of unrecognized tax benefits (UTB), calculated based on coefficient estimates from Rego and Wilson's (2012) Equation (1);<sup>11</sup> eso\_ind is 1 if the firm operates in industries likely to issue employee stock options (ESOs) and 0 otherwise; foreign is an indicator variable for the presence of foreign operations; pre-tax book income volatility (ptbi\_vol) is the standard deviation of pre-tax book income scaled by total assets, measured from years  $y-5$  through  $y$ ; tax loss

<sup>11</sup> utb\_est is used to proxy for the magnitude of uncertain tax positions. The amount of UTB is estimated because actual data is not available until 2007.

(tax\_loss) is an indicator variable for the presence of a tax loss for that taxable year; discounted operations (disc) is 1 if the absolute value of discontinued operations and extraordinary items is greater than 1 percent of sales, and 0 otherwise; big4 is an indicator variable for Big 4 audit firms (Price Waterhouse Coopers, Ernst & Young, and Deloitte); and kpmg equals 1 if the accounting firm is KPMG. I use audit fees as a joint proxy for audit risk and audit efforts (e.g., Hribar et al. 2013), with the net effect potentially cancelling each other.

Furthermore, I control for the possibility that accrual quality is affected by GAAP-induced mismapping rather than estimation error. Specifically, I use (i) an indicator for industries with potentially large tax deductions from ESOs (eso\_ind), and (ii) an indicator set equal to one if the absolute value of discontinued operations and extraordinary items is greater than one percent of revenues (disc).

Because there are firm characteristics that complicate judgments in tax-related accounts and lead to greater estimation error, I also control for the following firm characteristics: earnings volatility (ptbi\_vol), the presence of a tax loss (tax\_loss), and foreign operations (foreign). I also control for size as a proxy for the magnitude of available resources that potentially reduce management estimation error.

In addition, I control for audit firm characteristics. The indicator variable, big4 (kpmg) is included to differentiate between Big 4 and KPMG auditors as KPMG has been shown to have a larger reduction of APTS fees, which could therefore affect tax accrual quality (Lennox 2016). I also include industry fixed effects (Petersen 2009; Gow et al. 2010).

#### 4.4.1 Testing Hypothesis One

Hypothesis one states there is no difference in audit quality changes following the PCAOB 2006 restrictions between clients that significantly reduced APTS compared to clients that did not significantly reduce APTS. Using equation (3), if the financial statement quality of the treatment group declined (improved) more than the control group after the PCAOB 2006 rules were implemented, I would expect the  $\beta_3$  coefficient of the interaction term (reduce\*post) in equation (4) to be negative (positive). A negative coefficient would indicate the reductions in APTS result in a loss of knowledge spillover. Alternatively, a positive coefficient would indicate that the reductions in APTS mitigate the impact of economic dependence on audit quality, which is the premise behind the PCAOB 2006 restrictions. Given the conflicting arguments, I leave the coefficient on the interaction term (reduce\*post) unpredicted, consistent with hypothesis one.

#### 4.4.2 Testing Hypothesis Two: Tax aggressive group (aggressive)

Hypothesis two (2a and 2b) examines whether the changes in audit quality following the PCAOB 2006 restrictions are more pronounced for companies involved in aggressive tax avoidance via the assistance of APTS. I identify tax aggressive companies (aggressive) based on cash ETR, book ETR or permanent book to tax differences (permBTD) (Kubick et al. 2016; McGuire et al. 2012). More specifically, I define a tax aggressive company as one that has either a (i) cash or book ETR below the median or (ii) permBTD above the median. I include the aggressive dummy in my main regression model to obtain the following equation:

$$\begin{aligned} \text{taxaq}_{iy} = & \alpha_i + \beta_1 \text{reduce}_{iy} + \beta_2 \text{post}_{iy} + \beta_3 \text{aggressive}_{iy} + \beta_4 \text{reduce}_{iy} * \text{post}_{iy} + \beta_5 \\ & \text{post}_{iy} * \text{aggressive}_{iy} + \beta_6 \text{reduce}_{iy} * \text{aggressive}_{iy} + \beta_7 \text{reduce}_{iy} * \text{post}_{iy} * \text{aggressive}_{iy} + \sum \text{controls} \\ & + \varepsilon_{iy}, \end{aligned} \quad (5)$$

where  $i$  denotes company and  $y$  denotes year, respectively. In equation (5), the coefficient ( $\beta_1$ ) of the variable (reduce) represents the pre-event tax accrual quality (taxaq) for APTS reducing companies in the less tax aggressive category. I provide no prediction for  $\beta_1$  because less tax aggressive companies probably reduced APTS to signal financial reporting quality. The coefficient ( $\beta_2$ ) of the variable (post) represents the change in taxaq from the pre-event to the post-event window for non-APTS reducing companies in the less tax aggressive category. I predict no change in (taxaq) related to (post) because this group made no change in APTS or had no need to make a change. Furthermore, the coefficient ( $\beta_4$ ) of the interaction term (reduce\*post) represents the incremental change in (taxaq) from the pre-event to the post-event window for APTS reducing companies compared to the benchmark (non-APTS reducing companies).

Similarly, the coefficient ( $\beta_3$ ) of the variable (aggressive) represents the pre-event (taxaq) for non-APTS reducing companies in the tax aggressive category. Further, the coefficient ( $\beta_5$ ) of the interaction term (post\*aggressive) represents the incremental change in (taxaq) from the pre-event to the post-event window for non-APTS reducing companies in the tax aggressive category. The coefficient ( $\beta_6$ ) of the interaction term (reduce\*aggressive) represents the pre-event (taxaq) for APTS reducing companies in the tax aggressive category. I provide no prediction for  $\beta_3$ ,  $\beta_5$ , and  $\beta_6$  as the impact of aggressive tax advice on clients' tax accounts is affected by both the economic and reputational incentives of auditors. Finally, the coefficient ( $\beta_7$ ) of the three-way



interaction term (reduce\*post\*aggressive) represents the incremental change in (taxaq) from the pre-event to the post-event window for companies identified with both significant APTS reductions and aggressive tax practices.

Hypothesis 2a (H2a) states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and tax aggressive clients that did not significantly reduce APTS. To test this hypothesis, I calculate the difference between the changes in tax accrual quality for both groups of tax aggressive clients, for the group that reduced APTS and the group that did not reduce APTS. I first determine the variables that aggregate to determine each tax aggressive group's incremental change in (taxaq) in the post period and then take the difference in the change between the reducing and non-reducing subgroups. The following illustrates this process.

$$\begin{array}{lcl}
 \text{Aggressive/Reduce} & = & (\text{post}) + (\text{reduce*post}) + (\text{post*aggressive}) + (\text{reduce*post*aggressive}) \\
 \text{Aggressive/Not reduce} & = & (\text{post}) + (\text{post*aggressive}) \\
 \text{Difference} & = & (\text{reduce*post}) + (\text{reduce*post*aggressive})
 \end{array}$$

Thus, the sum of coefficients ( $\beta_4$ ) and ( $\beta_7$ ) of the interaction terms (reduce\*post) and (reduce\*post\*aggressive) determine H2a, the difference in audit quality changes between tax aggressive clients that significantly reduced APTS and tax aggressive clients that did not reduce APTS. Consistent with H2a, I do not make a directional prediction for the sum of these coefficients. A positive (negative) difference indicates a significantly larger increase (decrease) in tax accrual quality for tax aggressive companies that reduced their APTS compared to tax aggressive companies that did not reduce their APTS. A positive difference suggests that for more tax aggressive companies, APTS decreased audit quality through impaired auditor independence, while a negative difference suggests that APTS increased audit quality through knowledge spillover.

Hypothesis 2b (H2b) states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and less tax aggressive clients that also reduced APTS. To test this hypothesis, I calculate the difference between the change in tax accrual quality for both groups that reduced APTS, for the group that is more tax aggressive and the group that is less tax aggressive. I first determine the variables that aggregate to determine each APTS reducing group's incremental change in (taxaq) in the post period, then take the difference between the tax aggressive and non-tax aggressive subgroups. The following illustrates this process.

$$\begin{aligned} \text{Reduce/Aggressive} &= (\text{post}) + (\text{reduce*post}) + (\text{post*aggressive}) + (\text{reduce*post*aggressive}) \\ \text{Reduce/Not Aggressive} &= (\text{post}) + (\text{reduce*post}) \\ \text{Difference} &= (\text{post*aggressive}) + (\text{reduce*post*aggressive}) \end{aligned}$$

Thus, the sum of the coefficients ( $\beta_5$ ) and ( $\beta_7$ ) of the interaction terms (post\*aggressive) and (reduce\*post\*aggressive) determine H2b, the difference in audit quality changes between tax aggressive clients that significantly reduced APTS and less tax aggressive clients that also reduced APTS. Consistent with H2b, I do not make a directional prediction for the sum of these coefficients. A positive (negative) difference indicates a significantly larger increase (decrease) in tax accrual quality for APTS reducing companies that practice aggressive tax avoidance compared to companies that practice less aggressive tax avoidance. A significant positive difference suggests that for companies purchasing APTS, the change of an increase in audit quality is more pronounced for tax aggressive companies than for less tax aggressive companies. This indicates that the auditor independence impairment effects of APTS on audit quality are stronger for tax aggressive companies than for less tax aggressive companies. A negative difference suggests that for companies purchasing APTS, the change of an increase in

audit quality is more pronounced for tax aggressive companies than for less tax aggressive companies. This indicates that the knowledge spillover effects of APTS on audit quality are stronger for tax aggressive companies than for less tax aggressive companies.

#### 4.4.3 Testing Hypothesis Three (importance)

Hypothesis three (H3) examines whether the changes in audit quality following the PCAOB 2006 restrictions are more pronounced for important clients who represent a large portion of tax revenues. Similar to Reynolds and Francis (2001), I measure client tax importance as total tax fees from a single client relative to total tax fees received from all audit clients in a given office within a particular industry and Metropolitan Statistical Area (MSA) city and represents economic bonding at the local office level. All clients with tax importance measures greater than the median are considered “important”. I include the importance dummy in my main regression model to obtain the following equation:

$$\begin{aligned} \text{taxaq}_{iq} = & \alpha_i + \beta_1 \text{reduce}_{iq} + \beta_2 \text{post}_{iq} + \beta_3 \text{importance}_{iq} + \beta_4 \text{reduce} * \text{post}_{iq} + \\ & \beta_5 \text{reduce} * \text{importance}_{iq} + \beta_6 \text{post} * \text{importance}_{iq} + \beta_7 \text{reduce} * \text{post} * \text{importance}_{iq} + \sum \text{controls} \\ & + \varepsilon_{iq}, \end{aligned} \quad (6)$$

where  $i$  denotes company and  $y$  denotes year, respectively. The coefficient ( $\beta_1$ ) of the variable (reduce) represents the pre-event tax accrual quality (taxaq) for the group of clients that reduced APTS and are considered less important to their accounting firm. The coefficient ( $\beta_2$ ) of the variable (post) represents the change in (taxaq) from the pre-event to the post-event window for clients that did not reduce APTS and are considered less important to their accounting firm. Similarly, the coefficient ( $\beta_3$ ) of the variable

(importance) represents the pre-event (taxaq) for clients that did not reduce APTS and are important to their accounting firm's tax practice. Because of the offsetting incentives related to economic dependence vis-a-vis reputational concern, I do not make a directional prediction for  $\beta_3$ . The coefficient ( $\beta_4$ ) of the interaction term (reduce\*post) represents the incremental change in (taxaq) from the pre-event to the post-event window for clients reducing APTS compared to the pre-event (taxaq) for clients not reducing APTS. The coefficient ( $\beta_5$ ) of the interaction term (reduce\*importance) represents the pre-event (taxaq) for APTS reducing clients that are considered most important by their accounting firm. The coefficient ( $\beta_6$ ) of the variable (post\*importance) represents the incremental change in (taxaq) from the pre-event to the post-event window for clients considered most important by their accounting firm. Finally, the coefficient ( $\beta_7$ ) of the three-way interaction term (reduce\*post\*importance) represents the incremental change in (taxaq) from the pre-event to the post-event window for clients reducing APTS that are also considered most important by their accounting firm compared to pre-event (taxaq) for clients that did not reduce APTS and are considered less important by their accounting firm.

Hypothesis (H3) states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between local office important tax clients that significantly reduced APTS and local office important tax clients that did not significantly reduce APTS. To test this hypothesis, I calculate the difference between the changes in tax accrual quality for both groups of clients considered most important to their accounting firm, for the group that reduce APTS and the group that did not reduce APTS. I first determine the variables that aggregate to determine each (importance)

group's change, then take the difference between these variable groups. The following illustrates this process.

$$\begin{array}{lcl}
 \text{Important/Reduce} & = & (\text{post}) + (\text{reduce*post}) + (\text{post*importance}) + (\text{reduce*post*importance}) \\
 \text{Important/Not Reduce} & = & (\text{post}) + (\text{post*importance}) \\
 \text{Difference} & = & (\text{reduce*post}) + (\text{reduce*post*importance})
 \end{array}$$

Thus, the sum of the coefficients ( $\beta_4$ ) and ( $\beta_7$ ) of the interaction terms (reduce\*post) and (reduce\*post\*importance) determine H3, the difference in audit quality changes between local office important tax clients that significantly reduced APTS and local office important tax clients that did not significantly reduce APTS. Consistent with H3, I provide no directional predictions for the joint coefficients. A significant positive (negative) sum would indicate that, for clients considered most important to their accounting firm, the effects of economic dependence is stronger (weaker) than other factors such as knowledge spillover and reputational concern.

## CHAPTER 5 SAMPLE

### 5.1 Sample Selection

Table 1 delineates the sample section procedures for this study. The initial data period begins with firm-years ending December 16, 2003 and ends with firm-years ending July 31, 2009. Since APTS fees were not required to be disclosed until fiscal years closing after December 15, 2003, I begin my data period there. The data period cut-off date of July 31, 2009 is implemented to ensure there is roughly the same one year and eight month observation period before and after the event window (July 26, 2005 to October 31, 2006).

To examine the change in tax accrual quality over the one-year period before and after the reductions in APTS fees, the sample procedure, as reported in Table 1, begins by including all firm-year observations from Compustat Industrial Yearly for the years 2003 through 2009. The equation to calculate tax accrual (model (3)) requires a one year lag and lead for cash taxes paid, and the tax accrual quality (taxaq) variable is based on the standard deviation of the residuals from equation (3) over firm-years  $y-2$  to  $y$ . Therefore, firms with less than five years of consecutive required data are eliminated so to calculate the taxaq variable. Also eliminated are industry observations with less than 20 observations per industry year. The sample selection continues with Audit Analytics firm-year observations with audit fee data for the years 2003 through 2009 and only for firms with non-missing APTS data. The sample observations are restricted to the intersection of Compustat and Audit analytics with required financial and fee data. Since

only the last observation in the pre-event window is chosen and paired with the first observation in the post-event window for the same firm, observations not meeting this criteria are eliminated. The above procedures provides a full sample of 4,748 observations with 2,374 unique firms (a pre-event and post event observation for each firm).

Next, the propensity score model (2) is estimated (see Section 5.4 for the implementation of the propensity score matching procedures). Using the closest propensity scores obtained from model (2) results, one firm that did reduce (by 75% or more) APTS (reduce = 1) is matched with one firm that did not reduce (by 75% or more) APTS (reduce = 0). Since there are 565 firms that reduced (by 75% or more) APTS, there are 565 firms matched with these firms. This totals to 1,130 unique firms. Since each firm has a pre-event and post-event observation, there are 2,260 observations (1,130 firms \* 2 periods) in the propensity matched sample.

To obtain the aggressive variable, observations missing the needed data are further eliminated. Moreover, to minimize the effects when tax reduction is not a priority, observations with negative pre-tax income are also eliminated, consistent with prior studies (McGuire et al. 2012; Kubick et al. 2016). This leaves model (5) with a full sample of 3,605 observations and a propensity matched sample of 1,733 observations.

## **5.2 APTS, NAS and Audit Fee Statistics**

Table 2, panels A and B show the overall trend in fees based on all observations in audit analytics with the data period. Table 2, panel A reports mean APTS fees, mean other NAS fees, and mean audit fees, by year, from 2003 through 2009. APTS and NAS fees declined, while audit fees rose. Although SOX did not restrict APTS, 2004 APTS

fees declined by 12% from 2003 probably because pressure from boards and other interested parties caused both accounting firms and companies to voluntarily reduce or eliminate APTS. A larger APTS fee decline of 24% occurred in 2005 and its timing is aligned with the mandatory elimination of aggressive APTS mandated by the PCAOB 2006 restrictions. After 2005, the decline in APTS fees began to level off with a 7% decline from 2005.

In the meantime, NAS fees declined by 7% and 12% in 2004 and 2005, respectively, and increased by 7% in 2006. The 12% NAS fee decline, which occurred in 2005, suggests that both APTS and some NAS fees were reduced concurrently. Audit fees increased by 74% in 2004, consistent with the increase in internal control reporting requirements, and continued to increase throughout 2008.

Table 2, panel B reports the percentage decrease in APTS fees, the percentage decrease in NAS fees, and the percentage increase in audit fees by pre-event window, event window, and post-event window. For this table, a reduction is defined as any reduction in fees (not limited to the  $\geq 75\%$  APTS reduction used for defining the variable reduce). The pre-event window comprises fiscal years ending December 16, 2003 through July 25, 2005. The event window comprises fiscal years beginning or ending in the period from July 26, 2005 through October 31, 2006. The post event window comprises fiscal years beginning after October 31, 2006 (ending October 31, 2007 through July 31, 2009). The pre-event window dates coincide with the main implementation of SOX and the event window dates coincide with the implementation of the PCOAB 2006 restrictions.



APTS fees declined more in the event window than in the pre-event or post-event window. This finding is consistent with the implementation of the 2006 PCAOB restrictions. During the event window, 40.14% of observations show a reduction in APTS fees, the firm mean reduction in APTS fees is 21.01%, and the average magnitude of the reduction is 52.33%.

The pre-event window decline of NAS as reported in both the percentage of observations with a reduction in NAS (38.59%), and in the mean percentage reduction (22.98%) is expected as a result of firms complying with the additional internal control requirements mandated by SOX. Consistent with table 2, panel A, it appears that many firms reduced NAS along with APTS during the event window. While APTS and NAS fees declined during the sample period, audit fees rose. Furthermore, 76.95% of observations reported a mean 66.59% increase in audit fees during the pre-event window, and the increase continued into the event and post-event windows.

### **5.3 Determinants of Reduce Companies: Descriptive Statistics**

Table 3, panel A reports the descriptive statistics for the full sample. In my analysis, all continuous variables are winsorized at 1% and 99% in order to minimize the effect of outliers. While 23.8% of companies reported greater than or equal to a 75% reduction (reduce) in APTS fees from the pre-event to the post-event window, there is a 48.32% average reduction in other NAS fees (pctnas\_down) over this same period of time. In addition, 60.95% of firms were audited by a big 4 (big4) accounting firm and 13.86% were audited by KPMG (kpmg).

Table 3, panel B presents the descriptive statistics for the two subsamples estimating the matched propensity model (2) and compares firms that reduced (reduce) to

ones that did not reduce (not reduce) APTS fees by  $\geq 75\%$ , and includes the t-statistics for differences in means. Reduce companies reported a statistically significant larger amount than not reduce companies in seven characteristics. For reduce companies, the logarithm of their last APTS fee in the pre-event window ( $\ln_{last\_apts}$ ) was 11.21 compared to 8.85 for not reduce companies. This equates to \$67,512 of additional APTS fees paid, on average, by reduce companies per year.

Other significant differences include a higher percentage reduction in other NAS fees from the pre-event window to the post-event window ( $pct_{nas\_down}$ ) for reduce companies (54.5%) compared to not reduce companies (46.4%), a higher percentage of reduce companies (85%) that trade their stock on an exchange ( $stk$ ) compared to not reduce companies (79.3%), and more reduce companies (18.4%) use KPMG ( $kpmg$ ) as their auditor/tax provider compared to not reduce companies (12.4%). In addition, more reduce companies (49.4%) had foreign operations ( $foreign$ ) compared to not reduce companies (44.1%), more reduce companies (11.2%) reported a tax loss ( $tax\_loss$ ) compared to not reduce companies (6.9%), and reduce companies (8.3%) also reported a larger amount of large extraordinary items/discontinued operation amounts ( $disc$ ) compared to not reduce companies (5.7%). The differences in firm innate characteristics provide some justification for using the propensity matching approach.

#### **5.4 Determinants of Reduce Companies: Results from Implementing the Propensity Score Matching Approach**

Table 4 presents the results of the propensity matched model (2) regressions using the indicator variable reduce ( $reduce$ ) with a logistic regression; and as an alternative dependent variable, the absolute percentage decline in APTS fees ( $\%_{apts\_down}$ ) with an

ols regression. The reduction of APTS fees is significantly ( $<.0001$ ) positively related to the last APTS fees reported in the pre-event window ( $\ln_{last\_apts}$ ). In addition, the percentage decline of other NAS fees ( $pct_{nas\_down}$ ) is also significantly positively significant ( $<.05$ ). Size is significantly negatively related ( $<.05$ ) to reduce, which indicates that smaller companies are more apt to reduce ( $\geq 75\%$ ) APTS fees. In addition, reduce is significantly positively related ( $<.0001$ ) to KPMG, which indicates that KPMG is more apt to be the auditor/APTS provider for reduce companies than other big4 firms. Interestingly, reduce is significantly negatively related ( $<.0001$ ) to big4, which indicates that other big4 accounting firms are less apt to be related to a reduce company. Other than size, all related coefficients are consistent with Lennox (2016). Other than  $utb\_est$ , all significant coefficients are in the predicted direction. The  $R^2$ , which measures goodness-of-fit, is 15.6% and 17.2% with reduce and  $\%apts\_down$ , respectively, as alternative dependent variables.

Table 5 presents the descriptive statistics for covariates for the matched sample, comparing the control group (not reduce) to the treatment group (reduce), including t-statistics for the differences in means. The matching algorithm was successful in achieving balance, as the matched firms only differ in size and  $\ln_{last\_apts}$ . Reduce companies are slightly smaller in size and their last APTS fee in the pre-event window ( $\ln_{last\_apts}$ ) is less than not reduce companies. However, the economic differences of size and  $\ln_{last\_apts}$  between the two groups are relatively small.

### **5.5 Determinants of Tax Accrual Quality**

Descriptive statistics for the variables related to calculating tax accrual quality ( $taxaq$ ) from model (3) are untabulated. Total tax expense ( $tte$ ) exceeds cash taxes paid

(ctp). This is consistent with tax accrual (taxacc) being positive. Deferred long term tax asset (c\_dta) and liability (c\_dtl) changes are both positive, which indicate long term growth in both long term deferred tax assets and liabilities. Spearman (Pearson) correlation coefficients show, as expected, tax accrual (taxacc) is positively significantly correlated with lead cash taxes paid (ctp<sub>y+1</sub>) and change in long term deferred tax liability (c\_dtl), while negatively significantly correlated with cash taxes paid (ctp) and change in long term tax asset (c\_dta).

The model (4) regression results, untabulated, following the Fama-MacBeth (1973) procedure. All coefficients are significant ( $p < 0.01$ ) in the predicted direction. As expected and consistent with Choudhary et al. (2014, 2015), tax accrual (taxacc) is positively related to lead cash taxes paid (ctp<sub>y+1</sub>), lag cash taxes paid (ctp<sub>y-1</sub>), and change in long term deferred tax liability (c\_dtl); and negatively related to cash taxes paid (ctp) and change in long term deferred tax asset (c\_dta).

## CHAPTER 6 RESULTS

### 6.1 Descriptive Statistics

Table 6, panel A presents full sample descriptive statistics for main model (4) variables by pre-event window and post-event window, including t-statistics for the differences in means. The results related to client characteristics (size, utb\_est, eso\_ind, foreign, ptbi\_vol, tax\_loss and disc), used as control variables, are very similar to those reported by Choudhary et al. (2014, 2015). In the pre-event period, 68.87% of observations use a big4 accounting firm, while 15.92% use kpmg. Estimated mean unrecognized tax benefits (utb\_est) are 1.11% of assets, nearly half of firm-year observations operate in industries that offer stock options, while 39.8% have foreign operations.

There is a significant increase ( $<.05$ ) in tax accrual quality (taxaq) of 2.75 points and a significant increase ( $<.0001$ ) in size from the pre-event window to the post-event window for all the companies in the full sample, whether or not they are a reduce company. There is a significant decline in the use of both big4 accounting firms ( $<.0001$ ) and KPMG ( $<.05$ ) from the pre-event to the post-event window.

Table 6, panel B presents matched sample descriptive statistics for main model (4) variables by pre-event window and post-event window, including t-statistics for the differences in means. There is a significant increase ( $<.0001$ ) in tax accrual quality (taxaq) of 3.35 points and a significant increase ( $<.05$ ) in size from the pre-event window

to the post-event window for all the companies in the matched sample, whether or not they are a reduce company. Although there is slight decrease in the use of KPMG, it is not significant. In addition, there is a significant ( $<.0001$ ) decline in the use of big4 accounting firms from the pre-event to the post-event window. Overall, the descriptive statistics and differences are consistent between the full and matched samples.

Table 7, panel A reports Spearman and Pearson correlations for the full sample. Most correlations are under 16%. Although size and big4 are highly correlated, as expected, and foreign operations are highly correlated with unrecognized tax benefit estimates (utb\_estimate), multicollinearity does not appear to be a problem.<sup>12</sup> Taxaq is significantly positive correlated with the post-event period indicator (based on Pearson), suggesting an overall improvement in tax accrual quality following the PCAOB restrictions.

Table 7, panel B reports Spearman and Pearson correlations for the matched sample. Most correlations are under 16% and similar to the full sample. Although size and big4 are highly correlated, as expected, and foreign operations are highly correlated with unrecognized tax benefit estimates (utb\_estimate), multicollinearity does not appear to be a problem.<sup>13</sup>

## **6.2 Hypothesis Testing: Full Sample**

### **6.2.1 Testing Hypothesis One: Full Sample**

Table 8 presents the results from the model (4) regression using the full sample. Hypothesis 1 states the null hypothesis that there is no difference in audit quality changes

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<sup>12</sup> To mitigate the concern for multicollinearity, variable inflation factors and tolerance values were produced and reviewed. Based on these measures, no multicollinearity issues are present.

<sup>13</sup> To mitigate the concern for multicollinearity, variable inflation factors and tolerance values were produced and reviewed. Based on these measures, no multicollinearity issues are present.

following the PCAOB 2006 restrictions between companies that significantly reduced APTS (treatment group) compared to companies that did not significantly reduce APTS (control group). In other words, the interaction term of reduce\*post in table 8 should be insignificant for the null hypothesis to not be rejected. The interaction term, reduce\*post is positive and significant ( $<.05$ ), therefore, there is a significant difference between these groups. For reduce companies, their tax accrual quality (taxaq) increased significantly from the pre-event to the post-event window compared to not reduce companies. Therefore, the null hypothesis is rejected.

Table 8 also reports that tax accrual quality (taxaq) is significantly ( $<.05$ ) lower for reduce companies in the pre-event window than for not reduce companies, and companies using a big 4 firm have significantly ( $<.05$ ) higher tax accrual quality (taxaq) than other accounting firms. The unrecognized tax benefit estimate (utb\_est) is positively related to tax accrual, which is not in the predicted direction. This finding is similar to the utb\_est for the group of not important companies (table 15, panels B and D) or companies that purchase a smaller than median dollar amount of APTS from their local accounting office. The presence of a tax loss is significantly ( $<.0001$ ) negatively related to tax accrual quality (taxaq). A negative relationship is not a surprise because greater judgement is required when estimating the benefit of tax loss carryforwards and applying GAAP (e.g. Choudhary et al. 2015). All significant coefficients are in the predicted direction. Furthermore,  $R^2$ , which measures goodness-of-fit, is 11.25%.

Overall, the results suggest an overall improvement in audit quality for companies that significantly reduced APTS following the PCAOB restrictions. The findings are consistent with the PCAOB premise that the reduction in APTS mitigates the impact of

economic dependence on audit quality. Alternatively, arguments with respect to a loss of knowledge spillover tend to be largely unfounded.

### 6.2.2 Testing Hypothesis 2: Full Sample

Table 9, panel A presents the results from the model (5) regression using the full sample. Tax aggressive companies (aggress) have significantly ( $<.05$ ) lower tax accrual quality (taxaq) than not tax aggressive companies (not aggressive) in the pre-event window. All significant coefficients with respect to other control variables are in the predicted direction. The interaction terms, i.e., reduce\*post, post\*aggressive, reduce\*aggressive, reduce\*post\*aggressive, tend to assume a positive coefficient, although they are not statistically different from zero.

Table 9, panel B presents hypotheses 2a and 2b test results, based upon table 9, panel A results. Hypothesis 2a states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and tax aggressive clients that did not significantly reduce APTS. To test this hypothesis, the difference between both group's audit quality changes must be calculated.

First, the specific coefficients to determine tax accrual quality (taxaq) for the group of aggressive/reduce companies are reported in table 9 panel B, along with the F value and significance level. Results indicate that the sum of .00264 is significantly different from zero. In other words, for tax aggressive companies that reduced ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a significant ( $<.05$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.



Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of aggressive/not reduce companies are reported in table 9, along with the F value and significance level. Results indicate that the sum of .00046 is not significantly different from zero. In other words, for tax aggressive companies that did not reduce ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step tests hypothesis 2a and calculates the difference in audit quality changes between the aggressive/reduce and aggressive/not reduce group. The results are also reported in table 9, along with the F value and significance level. Results indicate that the difference of .00218 is significantly different from zero. The aggressive/reduce companies have a significantly ( $<.05$ ) higher increase in tax accrual quality than the aggressive/not reduce companies from the pre-event to the post-event window.

Hypothesis 2b states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and less tax aggressive clients that also reduced APTS. To test this hypothesis, the difference between both group's audit quality changes must be calculated. The first group to test for hypothesis 2b (aggressive/reduce) is the same as the first group in hypothesis 2a (reduce/aggressive), thus, for reduce companies defined as tax aggressive, there is a significant ( $<.05$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.

Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of reduce/not aggressive companies are reported in table 9, panel B, along with the F value and significance level. Results indicate that the sum of .00073 is not significantly

different from zero. In other words, for reduce companies not defined as tax aggressive, there is a no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step tests hypothesis 2b and calculates the difference in audit quality changes between the reduce/aggressive and reduce/not aggressive groups. The results are reported in table 9, panel B, along with their F value and significance level. Results indicate that the difference of .00191 is not significantly different from zero. Thus, there is no significant difference in audit quality changes from the pre-event to the post-event window between the reduce/aggressive and reduce/not aggressive groups of companies.

Overall, the null hypothesis for H2a is rejected. Combined H2a and H2b results suggest that tax aggressive companies that reduced APTS did experience a significant increase in tax accrual quality; by contrast, no audit quality change was observed for tax aggressive companies that did not reduce APTS and non-tax aggressive companies that also reduced APTS. These findings are largely consistent with economic bonding, suggesting the APTS restrictions likely weaken the economic bond between the auditor and client, especially in regard to companies that purchase aggressive APTS.

### 6.2.3 Testing Hypothesis 3: Full Sample

Table 10, panel A presents the results from model (6) using the full sample. Reduce companies also considered most important by their accounting firm significantly (.10) increased their tax accrual quality (taxaq) from the pre-event to the post-event window. KPMG clients are significantly (<.05) negatively related to tax accrual quality (taxaq), while Big4 accounting firm clients are significantly positively (<.10) related to tax accrual quality (taxaq). In addition, all significant coefficients are in the predicted direction.

Table 10, panel B presents hypotheses 3 test results, based upon table 10, panel A results. Hypothesis 3 states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between local office important tax clients that significantly reduced APTS and important tax clients that did not significantly reduce APTS. To test this hypothesis, the difference between both group's audit quality changes must be calculated.

First, the specific coefficients to determine tax accrual quality (taxaq) for the group of important/reduce companies are reported in table 10 panel B, along with their F value and significance level. Results indicate that the sum of .00398 is significantly different from zero. In other words, for important companies that reduced ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a significant ( $<.05$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.

Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of important/not reduce companies are reported in table 10, panel B, along with their F value and significance level. Results indicate that the sum of .00045 is not significantly different from zero. In other words, for important companies that did not reduce ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step determines hypothesis 3 and calculates the difference in audit quality changes between the important/reduce and important/not reduce group. The results are reported in table 10, panel B, along with their F value and significance level. Results indicate that the difference of .00353 is significantly different from zero.

Although the difference did not reach statistical significance at .05, important/reduce companies have a marginally significant ( $<.10$ ) higher increase in tax accrual quality (taxaq) from the pre-event to the post-event window than the important/not reduce companies.

Overall, companies considered important tax clients by their audit firms that significantly reduced APTS did experience a marginally greater increase in audit quality after the change compared to other important tax clients that did not significantly reduce APTS. Taken together, my results indicate that the PCOAB 2006 restrictions were effective in restricting APTS and economic bonding, thereby leading to improved audit quality, especially among companies associated with aggressive tax services.

### **6.3 Hypothesis Testing: Matched Sample**

#### **6.3.1 Testing Hypothesis One: Matched Sample**

Table 11 presents the results from the model (4) regression using the matched sample. Hypothesis 1 states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between companies that significantly reduced APTS (treatment group) compared to companies that did not significantly reduce APTS (control group). Therefore, no prediction is provided for the interaction term of reduce\*post in table 11. Results show that the interaction term reduce\*post, is positive and although the result did not reach statistical significance of .05, there is a marginally significant ( $<.10$ ) difference between these groups. For reduce companies, their tax accrual quality (taxaq) increased from the pre-event to the post-event window compared to not reduce companies. The results are very similar to those reported for the full sample (table 8),

providing support for the PCOAB premise that the reductions in APTS mitigate the impact of economic dependence on audit quality.

Table 11 also reports that tax accrual quality (taxaq) is marginally significantly ( $<.10$ ) lower for reduce companies in the pre-event window than for not reduce companies, and companies using a big 4 firm have significantly ( $<.05$ ) higher tax accrual quality (taxaq) than other accounting firms. The presence of a tax loss is significantly ( $<.0001$ ) negatively related to tax accrual quality (taxaq). A negative relationship is not a surprise because greater judgement is required when estimating the benefit of tax loss carryforwards and applying GAAP (e.g. Choudhary et al. 2015). All significant coefficients are in the predicted direction. Furthermore, the  $R^2$ , which measures goodness-of-fit, is 13.18%.

### 6.3.2 Testing Hypothesis Two: Matched Sample

Table 12, table A presents the results from the model (5) regression using the matched sample. Tax aggressive companies (aggress) have significantly ( $<.05$ ) lower tax accrual quality (taxaq) than not tax aggressive companies (not aggressive) in the pre-event window. Size is significantly ( $<.001$ ) positively related to tax actual quality (taxaq). All significant coefficients are in the predicted direction. The model (5) results using the matched sample are consistent with results using the full sample (table 9).

Table 12, panel B presents hypotheses 2a and 2b test results, based upon table 12, panel A results. Hypothesis 2a states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and tax aggressive clients that did not significantly reduce APTS. To test

this hypothesis, the difference between both group's audit quality changes must be calculated.

First, the specific coefficients to determine tax accrual quality (taxaq) for the group of aggressive/reduce companies are reported in table 12 panel B, along with their F value and significance level. Results indicate that the sum of .00262 is significantly different from zero. In other words, for tax aggressive companies that reduced ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a significant ( $<.05$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.

Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of aggressive/not reduce companies are reported in table 12, panel B, along with their F value and significance level. Results indicate that the sum of -.00036 is not significantly different from zero. In other words, for tax aggressive companies that did not reduce ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step tests hypothesis 2a and calculates the difference in audit quality changes between the aggressive/reduce and aggressive/not reduce group. The results are reported in table 12, panel B, along with their F value and significance level. Results indicate that the difference of .00298 is significantly different from zero. The aggressive/reduce companies have a significantly ( $<.05$ ) higher increase in tax accrual quality than the aggressive/not reduce companies in the post-event window. The difference between the groups is significant at  $<.05$  when using both the matched and full sample.

Hypothesis 2b states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between tax aggressive clients that significantly reduced APTS and less tax aggressive clients that also reduced APTS. To test this hypothesis, the difference between both group's audit quality changes must be calculated. The first group to test for hypothesis 2b (aggressive/reduce) is the same as the first group in hypothesis 2a (reduce/aggressive), thus, for reduce companies defined as tax aggressive, there is a significant ( $<.05$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.

Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of reduce/not aggressive companies are reported in table 12, panel B, along with their F value and significance level. Results indicate that the sum of .00098 is not significantly different from zero. In other words, for reduce companies not defined as tax aggressive, there is a no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step tests hypothesis 2b and calculates the difference in audit quality changes between the reduce/aggressive and reduce/not aggressive groups. The results are also reported in table 12, panel B, along with their F value and significance level. Results indicate that the difference of .00165 is not significantly different from zero. Thus, there is no significant difference in audit quality changes from the pre-event to the post-event window between the reduce/aggressive and reduce/not aggressive groups of companies.

Overall, results based on the matched sample are largely consistent with those reported for the full sample (tables 8-10).

### 6.3.3 Testing Hypothesis Three: Matched Sample

Table 13, panel A presents the results from model (6) using the matched sample. Big4 accounting firm clients are significantly positively ( $<.001$ ) related to tax accrual quality (taxaq). In addition, all significant coefficients are in the predicted direction.

Table 13, panel B presents hypotheses 3 test results, based upon table 13, panel A results. Hypothesis 3 states that there is no difference in audit quality changes following the PCAOB 2006 restrictions between local office important tax clients that significantly reduced APTS and important tax clients that did not significantly reduce APTS. To test this hypothesis, the difference between both group's audit quality changes must be calculated.

First, the specific coefficients to determine tax accrual quality (taxaq) for the group of important/reduce companies are reported in table 13 panel B, along with their F value and significance level. Results indicate that the sum of .00323 is significantly different from zero. Although results did not reach a significance level of  $<.05$ , for important companies that reduced ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a marginally significant ( $<.10$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window.

Second, the specific coefficients to determine tax accrual quality (taxaq) for the group of important/not reduce companies are reported in table 13, panel B, along with their F value and significance level. Results indicate that the sum of .00087 is not significantly different from zero. In other words, for important companies that did not reduce ( $\geq 75\%$ ) APTS from the pre-event to the post event window, there is a no



significant change in tax accrual quality (taxaq) from the pre-event to the post-event window.

The third step tests hypothesis 3 and calculates the difference in audit quality changes between the important/reduce and important/not reduce group. The results are reported in table 13, panel B, along with their F value and significance level. Results indicate that the difference of .00236 is not significantly different from zero. Although, there is a difference in tax accrual changes from the pre-event to the post-event window between important/reduce and important/not reduce companies, it did not reach statistical significance. Thus, the findings based on the matched sample are weaker than those based on the full sample.

#### **6.4 Main Regression Model (4) Subsample Testing**

##### **6.4.1 Subsamples by Aggressive**

Table 14, panels A and B present results of model (4) using the full sample, partitioned by tax aggressiveness. There is a significant ( $<.05$ ) increase from the pre-event to the post-event window in tax accrual quality (taxaq) of reduce aggressive companies. There is no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window for not aggressive reduce companies.

Table 14, panels C and D present results of model (4) using the matched sample, partitioned by aggressiveness. Although the level of significance did not reach .05, tax accrual quality (taxaq) is statistically ( $<.10$ ) marginally lower in the pre-event period for reduce aggressive companies compared to not reduce aggressive companies. In addition, there is a significant ( $<.05$ ) increase from the pre-event to the post-event window in tax accrual quality (taxaq) of reduce aggressive companies compared to not reduce

aggressive companies. For not aggressive reduce companies, there is no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window compared to not aggressive not reduce companies. The subsample analysis, based on the matched sample, yields similar findings to the full sample results (panels A and B).

#### 6.4.2 Subsample by Importance

Table 15, panel A reports results from model (4) using the full sample and important client companies. Although the significance level did not reach .05, there is a marginally significant ( $<.10$ ) increase in tax accrual quality (taxaq) from the pre-event to the post-event window for reduce important client companies. There is a significant ( $<.05$ ) lower tax accrual quality (taxaq) for important reduce companies in the pre-event window compared to important not reduce companies. Results are consistent with the decline in APTS fees by companies who have a large amount of APTS fees and lower tax accrual quality (taxaq) in the pre-event window, and show an increase in tax accrual quality from the pre-event to the post-event window. All significant coefficients are in the predicted direction.

Table 15, panel B reports the results from model (4) using the full sample and important client companies. There is not a significant change in tax accrual quality (taxaq) from the pre-event to the post-event window for not important reduce companies. There is a significant ( $<.05$ ) positive relationship between not important client companies of big4 accounting firms and tax accrual quality (taxaq). Differing from the projected direction, for not important companies, the unrecognized tax benefit estimate (utb\_est) is significantly ( $<.05$ ) positively related to tax accrual quality (taxaq).

Thus, comparing table 15, panels A and B reveals that for all reduce companies, important client companies, compared to not important client companies, had a significant increase in their tax accrual quality (taxaq) from the pre-event to the post-event window. Important client companies are those with a stronger economic bond with their auditor/tax provider, so by reducing this bond (reducing APTS), tax accrual quality (taxaq) rose.

Table 15, panel C presents results from model (4) using the matched sample and important client companies. There is no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window for important reduce companies. There is significantly ( $<.05$ ) lower tax accrual quality (taxaq) for important reduce companies in the pre-event window compared to important not reduce companies. Results are consistent with the decline in APTS fees by companies who have a large amount of APTS fees and lower tax accrual quality (taxaq) in the pre-event window. Size has a marginally significant ( $<.10$ ) negative relationship with tax accrual quality for important client companies. This differs from the full sample and aggressive results that show a positive relationship (although insignificant for the full sample, in table 15, panel A) with tax accrual quality. Other than size, all significant coefficients are in the predicted direction.

Table 15, panel D presents results from model (4) using the matched sample and not important client companies. There is no significant change in tax accrual quality (taxaq) from the pre-event to the post-event window for not important reduce companies. As in the full sample, the *utb\_est* is significantly ( $<.05$ ) positively related to tax accrual

quality (taxaq) for not important client companies. Other than `utb_est`, all significant coefficients are in the predicted direction.

Therefore, comparing table 15 panels C and D, reveals that for the matched sample, the importance or not importance status of a client company is not a significant factor in the change of tax accrual quality (taxaq) from the pre-event to the post-event window.

### **6.5 Additional Analysis**

An alternative explanation for the improvement in audit quality following APTS reduction is increased audit efforts. As table 2 suggests, the percentage of observations reporting an increase in audit fees and the mean percentage increase in audit fees also during the implementation period were 65.07% and 53.29%, respectively. The increase in audit fees coincides with the changes in APTS and tax accrual quality. To examine whether my results can be explained by an overall increase in auditor effort to increase audit quality for all companies, I control for the logarithm of audit fees in model (4) and report the results from this additional analysis in table 16. Results for the full and matched sampled (panels A and B, respectively) are very similar to those reported in Tables 8 and 11.

I also perform several other robustness checks to support the main results. Quarterly tax accrual quality was used as an alternative dependent variable for model (4). Missing quarterly measured tax accrual quality data was filled in with yearly measured tax accrual quality data. Results, untabulated, from the rerun model (4) are consistent with findings from table 8, including a significance level of  $<.05$  for both `reduce` and `reduce*post`.

In addition, the propensity matching model (2) was run using an alternative sample. As with the final sample, observations missing the needed data to compute the tax aggressiveness indicator variable and have negative pre-tax book income are eliminated. For the alternative matched sample, the elimination of these observations are done prior to the propensity matching, as opposed to after. This change resulted in 2,063 companies as opposed to 2,374 for the propensity match model. A new propensity match was completed which resulted in 501 matched companies, for a total of 2004 observations (501 x 4). This is compared to 565 matched companies, for a total of 2,260 in the final sample. Preliminary analysis finds that for companies that did not significantly reduce APTS, the loss companies eliminated reported a smaller amount of APTS fees (*lnlast\_apt*s) in their last financial statement in the pre-event window than non-loss companies that also did not reduce APTS. Using this alternative sample, results from model (4), untabulated, include weak support for hypothesis 1 and no significant reduction in APTS fees from the pre-event to the post-event window. In addition, size is significant ( $<.05$ ) whereas with the final matched sample, size was not significant. Other results are similar to the matched final sample.

I mitigate timing issues created by the tax accrual quality measure by extending both the pre-event and post-event windows. The residual from model (3) captures the precision in which the income tax accrual maps into not only current ( $t$ ), but also past ( $t - 1$ ) and future ( $t + 1$ ) income taxes paid after controlling for a long-term temporary book-tax difference. Tax accrual reversals outside the  $t - 1$  through  $t + 1$  window are typically not pervasive (Choudhary et al. 2016). First, I set a one-year lag between the event and post-event periods. The one-year lag ensures the firm's post-event residuals (capturing

estimation error in the income tax account) are all estimated based on data during the post-event period. Therefore, the event window was widened to July 31, 2010. Model (4) was run using the later measurement and results, untabulated, are consistent with results. Second, I include an additional year of tax accrual data when calculating pre-event taxaa. Thus, taxaa in the pre-event period is measured using the last two financial statements in the pre-event window. Using the new pre-event taxaa, model (4) was run using the new pre-event taxaa and results, untabulated, are consistent with findings.

Other robustness checks were performed by using an alternative regression method, qlim (qualitative and limited dependent variable model), for appropriate models. Results were similar.

## CHAPTER 7 CONCLUSION

With the intention to increase audit quality, the PCAOB Rules on Ethics, Independence, and Tax Services prohibit accounting firms from providing aggressive tax services to their audit clients. The PCAOB is concerned that APTS create an economic bond between the auditor and their client that can reduce audit quality. On the other hand, APTS can create knowledge spillover that can increase audit quality.

I investigate whether companies that significantly decreased APTS surrounding the effective date of the PCAOB 2006 restrictions had an improvement in audit quality after the change compared to companies that did not significantly reduce APTS. I also investigate whether companies associated with tax aggressive services are more likely to experience an improvement in audit quality following the reductions in APTS, since the target of the PCAOB 2006 restrictions is companies that purchase aggressive APTS.

My findings indicate that audit quality increased following the PCOAB 2006 restrictions as a result of a reduction in economic bonding between the auditor and client. Companies that reduced APTS experienced an improvement in audit quality after the change compared to no change in audit quality for companies that did not significantly reduce APTS. More specifically, tax aggressive companies that reduced APTS experienced an increase in audit quality after the change, but companies not considered tax aggressive that also reduced APTS and tax aggressive companies that did not reduce

APTS did not experience a significant increase in audit quality after the change. In addition, companies considered important tax clients by their audit firms that significantly reduced APTS had a greater increase, although marginal, in audit quality after the change compared to other important tax clients that did not significantly reduce APTS. Companies considered important tax clients by their audit firms that did not reduce APTS experienced no change in audit quality.

Finally, my results indicate that the PCOAB 2006 restrictions were effective in decreasing APTS and economic bonding, and thus led to an increase in audit quality. This is especially true for the target of the PCAOB 2006 restrictions - companies that purchase aggressive APTS. Therefore, I did not find evidence of a loss of knowledge spillover related to a reduction in APTS. The effectiveness of the PCAOB 2006 restrictions on audit quality are investigated by few studies. Therefore, my study fills this void by using a tax specific measure of audit quality, tax accrual quality, to specifically examine the target of the restrictions— audit clients that are associated with aggressive tax services. My study confirms and contributes to the research on economic bonding, audit quality, tax accrual quality, and tax aggressiveness, and can be a useful tool in current policy debates.



## APPENDICES

APPENDIX A: Public Company Accounting Oversight Board (PCAOB)  
Rules on Ethics, Independence, and Tax Services

Section 3: Auditing and Related Professional Practice Standards  
Part 5: Ethics and Independence  
Subpart 1 - Independence

Rule 3520. Auditor Independence

A registered public accounting firm and its associated persons must be independent of the firm's audit client throughout the audit and professional engagement period.

Note 1: Under Rule 3520, a registered public accounting firm or associated person's independence obligation with respect to an audit client encompasses not only an obligation to satisfy the independence criteria applicable to the engagement set out in the rules and standards of the PCAOB, but also an obligation to satisfy all other independence criteria applicable to the engagement, including the independence criteria set out in the rules and regulations of the Commission under the federal securities laws.

Note 2: Rule 3520 applies only to those associated persons of a registered public accounting firm required to be independent of the firm's audit client by standards, rules or regulations of the Board or Commission or other applicable independence criteria.

(Effective April 29, 2006)

Rule 3521. Contingent Fees

A registered public accounting firm is not independent of its audit client if the firm, or any affiliate of the firm, during the audit and professional engagement period,

provides any service or product to the audit client for a contingent fee or a commission, or receives from the audit client, directly or indirectly, a contingent fee or commission.

(Effective: Rule 3521 will not apply to contingent fee arrangements that were paid in their entirety, converted to fixed fee arrangements, or otherwise unwound before June 18, 2006.)

#### Rule 3522. Tax Transactions

A registered public accounting firm is not independent of its audit client if the firm, or any affiliate of the firm, during the audit and professional engagement period, provides any non-audit service to the audit client related to marketing, planning, or opining in favor of the tax treatment of, a transaction -

(a) **Confidential Transactions** - that is a confidential transaction; or

(b) **Aggressive Tax Position Transactions** - that was initially recommended, directly or indirectly, by the registered public accounting firm and a significant purpose of which is tax avoidance, unless the proposed tax treatment is at least more likely than not to be allowable under applicable tax laws.

Note 1: With respect to transactions subject to the United States tax laws, paragraph (b) of this rule includes, but is not limited to, any transaction that is a listed transaction within the meaning of 26 C.F.R. § 1.6011-4(b)(2).

Note 2: A registered public accounting firm indirectly recommends a transaction when an affiliate of the firm or another tax advisor, with which the firm has a formal agreement or other arrangement related to the promotion of such transactions, recommends engaging in the transaction.

(Effective: Rule 3522 will not apply to tax services that were completed by a registered public accounting firm no later than June 18, 2006.)

#### Rule 3523. Tax Services for Persons in Financial Reporting Oversight Roles

A registered public accounting firm is not independent of an issuer audit client if the firm, or any affiliate of the firm, during the professional engagement period provides any tax service to a person in a financial reporting oversight role at the issuer audit client, or an immediate family member of such person, unless -

(a) the person is in a financial reporting oversight role at the issuer audit client only because he or she serves as a member of the board of directors or similar management or governing body of the audit client;

(b) the person is in a financial reporting oversight role at the issuer audit client only because of the person's relationship to an affiliate of the entity being audited-

(1) whose financial statements are not material to the consolidated financial statements of the entity being audited; or

(2) whose financial statements are audited by an auditor other than the firm or an associated person of the firm; or

(c) the person was not in a financial reporting oversight role at the issuer audit client before a hiring, promotion, or other change in employment event and the tax services are -

(1) provided pursuant to an engagement in process before the hiring, promotion, or other change in employment event; and

(2) completed on or before 180 days after the hiring or promotion event.

Note: In an engagement for an issuer audit client whose financial statements for the first time will be required to be audited pursuant to the standards of the PCAOB, the provision of tax services to a person covered by Rule 3523 before the earlier of the date that the firm: (1) signed an initial engagement letter or other agreement to perform an audit pursuant to the standards of the PCAOB, or (2) began procedures to do so, does not impair a registered public accounting firm's independence under Rule 3523.

[Effective pursuant to SEC Release No. 34-53677, File No. PCAOB-2006-01 (April 19, 2006); SEC Release No. 34-58415, File No. PCAOB-2008-03 (August 22, 2008); and SEC Release No. 34-72087, File No. PCAOB-2013-03 (May 2, 2014)]

Rule 3524. Audit Committee Pre-approval of Certain Tax Services

In connection with seeking audit committee pre-approval to perform for an issuer audit client any permissible tax service, a registered public accounting firm shall -

(a) describe, in writing, to the audit committee of the issuer -

(1) the scope of the service, the fee structure for the engagement, and any side letter or other amendment to the engagement letter, or any other agreement (whether oral, written, or otherwise) between the firm and the audit client, relating to the service; and

(2) any compensation arrangement or other agreement, such as a referral agreement, a referral fee or fee-sharing arrangement, between the registered public accounting firm (or an affiliate of the firm) and any person (other than the audit client) with respect to the promoting, marketing, or recommending of a transaction covered by the service;

(b) discuss with the audit committee of the issuer the potential effects of the services on the independence of the firm; and

(c) document the substance of its discussion with the audit committee of the issuer.

[Effective pursuant to SEC Release No. 34-53677, File No. PCAOB-2006-01 (April 19, 2006); and SEC Release No. 34-72087, File No. PCAOB-2013-03 (May 2, 2014)]

Rule 3525. Audit Committee Pre-approval of Non-audit Services Related to Internal Control Over Financial Reporting

In connection with seeking audit committee pre-approval to perform for an issuer audit client any permissible non-audit service related to internal control over financial reporting, a registered public accounting firm shall -

(a) describe, in writing, to the audit committee of the issuer the scope of the service;

(b) discuss with the audit committee of the issuer the potential effects of the service on the independence of the firm; and

Note: Independence requirements provide that an auditor is not independent of his or her audit client if the auditor is not, or a reasonable investor with knowledge of all relevant facts and circumstances would conclude that the auditor is not, capable of exercising objective and impartial judgment on all issues encompassed within the accountant's engagement. Several principles guide the application of this general standard, including whether the auditor assumes a management role or audits his or her own work. Therefore, an auditor would not be independent if, for example, management had delegated its responsibility for internal control over financial reporting to the auditor or if the auditor had designed or implemented the audit client's internal control over financial reporting.

(c) document the substance of its discussion with the audit committee of the issuer.

[Effective pursuant to SEC Release No. 34-56152, File No. PCAOB-2007-02 (July 27, 2007); and SEC Release No. 34-72087, File No. PCAOB-2013-03 (May 2, 2014)]

#### Rule 3526. Communication with Audit Committees Concerning Independence

A registered public accounting firm must -

(a) prior to accepting an initial engagement pursuant to the standards of the PCAOB -

- (1) describe, in writing, to the audit committee of the potential audit client, all relationships between the registered public accounting firm or any affiliates of the firm and the potential audit client or persons in financial reporting oversight roles at the potential audit client that, as of the date of the communication, may reasonably be thought to bear on independence;
- (2) discuss with the audit committee of the potential audit client the potential effects of the relationships described in subsection (a)(1) on the independence of the registered public accounting firm, should it be appointed the potential audit client's auditor; and
- (3) document the substance of its discussion with the audit committee of the potential audit client.

(b) at least annually with respect to each of its audit clients -

- (1) describe, in writing, to the audit committee of the audit client, all relationships between the registered public accounting firm or any affiliates of the firm and the audit client or persons in financial reporting oversight roles at the audit client that, as of the date of the communication, may reasonably be thought to bear on independence;
- (2) discuss with the audit committee of the audit client the potential effects of the relationships described in subsection (b)(1) on the independence of the registered public accounting firm;
- (3) affirm to the audit committee of the audit client, in writing, that, as of the date of the communication, the registered public accounting firm is independent in compliance with Rule 3520; and
- (4) document the substance of its discussion with the audit committee of the audit client.

[Effective pursuant to SEC Release No. 34-58415, File No. PCAOB-2008-03 (August 22, 2008); and SEC Release No. 34-72087, File No. PCAOB-2013-03 (May 2, 2014)]



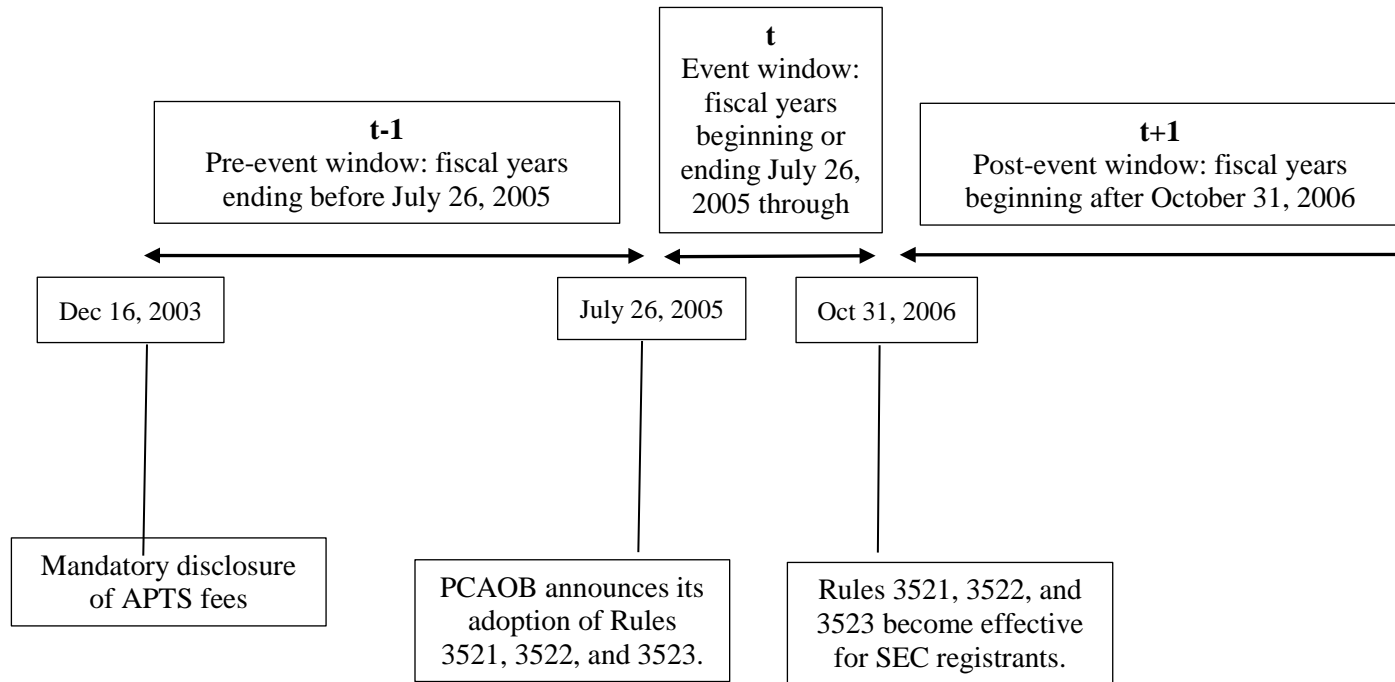
## APPENDIX B: Variable Definitions

Variable	Definition
taxaq	Tax accrual quality: Standard deviation of each firm's residuals from industry year estimates of Equation 3 ( $\text{taxacc}_{cy} = \beta_0 + \beta_1 \text{ctp}_{c,y-1} + \beta_2 \text{ctp}_{cy} + \beta_3 \text{ctp}_{c,y+1} + \beta_4 \text{c\_dtl}_{cy} + \beta_5 \text{c\_dta}_{cy} + \varepsilon_{cy}$ ) for y-2 to y, multiplied by -1 so larger values indicate better tax accrual quality. A minimum of 20 observations per industry-year is required to estimate taxaq.
taxacc	Total tax accrual, defined as $\text{tte} - \text{ctp}$ .
tte	Total tax expense, scaled by total assets.
ctp	Cash taxes paid related to income taxes, scaled by total assets.
c_dtl	Change in long-term deferred tax liability, scaled by total assets.
c_dta	Change in long-term deferred tax asset, scaled by total assets.
apts	The magnitude of auditor provided tax service fees
lnlast_apts	The logarithm of auditor provided tax service fees from the last financial statement in the pre-event window.
%apts_down	The absolute percent reduction in auditor provided tax service fees = $\left  \frac{\text{apts}_{it} - \text{apts}_{it-1}}{\text{apts}_{it-1}} \right $ if $\text{apts}_{it} < \text{apts}_{it-1}$ ; otherwise 0 if $\text{apts}_{it} \geq \text{apts}_{it-1}$ , where t is in the post event window and t-1 is in the pre-event window.
%othernas_down	The absolute percentage reduction of non-audit less tax service fees = $\left  \frac{\text{othernas}_{it} - \text{othernas}_{it-1}}{\text{othernas}_{it-1}} \right $ if $\text{othernas}_{it} < \text{othernas}_{it-1}$ , otherwise 0 if $\text{othernas}_{it} \geq \text{othernas}_{it-1}$ , where t is in the post event window and t-1 is in the pre-event window.
reduce	The REDUCE group membership indicator variable = 1 if %apts_down $\geq$ the 75%, 0= otherwise.
post	A financial statement indicator variable where 1 = fiscal years beginning after October 31, 2006 through July 31, 2008 and 0, otherwise
aggressive	The AGGRESSIVE group membership indicator variable where 1 = if a company has either (i) a cash or book effective tax rate below the median or (ii) a permanent book to tax difference above the median, and 0 otherwise.
importance	Client importance indicator variable where 1 = important and 0 = otherwise. Clients considered important have > median level of importance, measured as the magnitude of total tax fees from a single client relative to total tax fees received from all audit clients in a given office within a particular industry and Metropolitan Statistical Area (MSA) city.

### Controls:

size	Logarithm of total assets.
stk	Stock market is an indicator variable if the stock is traded on an exchange, and 0 otherwise.
loss	Loss is an indicator variable where 1 = net loss after taxes, and 0 otherwise.
utb_est	Predicted value of unrecognized tax benefits., based on coefficient estimates from Rego and Wilson's (2012) Equation (1): $\text{utb\_est} = -.00010072 + (.00648*\text{ptroa}) + (.00078288*\text{size}) + (.00601*\text{foreign}) + (.06494*\text{rd}) + (.00080232*\text{lev}) + (.00521*\text{sga}) + (.0000003193495*\text{mtb}) - (.00176*\text{sales\_gr})$
ptroa	pre-tax return on assets, calculated as pretax income scaled by prior period total assets.
size	Logarithm of total assets.
foreign	Indicator variable for the presence of foreign operations: 1 = non-zero foreign tax expense, 0 = otherwise.
rd	Research and development expenses, scaled by prior period total assets.
lev	Total debt divided by total assets.
sga	Selling, general and administrative expenses, scaled by prior period total assets.
mtb	Market to book ratio.
sales_gr	Percentage change in sales from the previous period.
eso_ind	Indicator variable for industries likely to issue ESOs: 1 = firm operates in an industry with potentially large tax deductions from the exercise of options (Industry SIC codes 30-39 and 70-89), and 0 = otherwise.
ptbi_vol	Standard deviation of pre-tax book income scaled by total assets, measured from years y-5 through y.
tax_loss	Indicator variable for the presence of a tax loss for that taxable year: 1 = tax expense < 0, and 0 = otherwise.
disc	Indicator variable for the presence of large discontinued operations or extraordinary items: 1 = the absolute value of discontinued operations and extraordinary items > 1% of sales, and 0 = otherwise.
big4	Indicator variable for Tier 1 audit firms: 1 = Big 4 firm (Price Waterhouse Coopers, Ernst & Young, Deloitte, or KPMG), 0 = otherwise.
kpmg	Indicator variable for accounting firm KPMG: 1 = KPMG, and 0 otherwise.

**Figure 1: Timeline**



Note: APTS fees and tax accrual quality are derived from the last financial statement in the pre-event window and the first financial statement in the post-event window. Any reduction in APTS fees (or change in tax accrual quality) occurring during the event period is measured by taking the difference between pre-event and post-event window APTS fees (or tax accrual quality).

**TABLE 1: Sample Selection**

Firm-year Compustat observations with data (taxacc <sub>t</sub> , ctp <sub>t-1</sub> , ctp <sub>t</sub> , ctp <sub>t+1</sub> , c_dtl <sub>t</sub> , c_dtat) between 2003 and 2009		50,764	
Less:			
Observations with less than 5 years of consecutive data during the required period and industry observations with less than 20 observations per industry year		(10,505)	
Sample of observations used to estimate Taxa <sub>q</sub>		40,259	
Table 2, Panel A: Firm-year observations with Audit Analytics			
with non-missing audit fee and APTS data between 2002 and 2009	63,891		
Less:			
2002 firm-year observations	(6,753)		
Firm-year observations with Audit Analytics with non-missing audit fee and APTS data between 2003 and 2009	57,138		
Less:			
Observations not matched between Compustat and Audit Analytics	(26,054)	(9,175)	
	31,084	31,084	
Observations missing data to compute required variables		(9,733)	
Observations outside the pre-event and post-event windows		(9,787)	
Observations not qualifying as last in the pre-event window or first in the post-event window		(4,871)	
Observations lacking either a pre-event or post-event partner		(1,945)	
Full Sample (565 and 1,809 unique Reduce and Not Reduce firms)		4,748	
Less:			
Observations unmatched as result of propensity matching		(2,488)	
Propensity Matched Sample (565 and 565 unique Reduce and Not Reduce firms)		2,260	
Less:			
Observations missing data to compute aggressive variable or observations with negative pre-tax book income		(1,143)	(527)
Model 5 Sample		3,605	1,733

**TABLE 2: Fees By Year and Window****Panel A: By Year - Mean Auditor Provided Tax Service Fees, Other Non-audit Service Fees, and Audit Fees (n=63,891)**

Year	Fees for auditor provided tax services (\$000)		Fees for other non-audit services (\$000)		Fees for audits (\$000)	
		% chng		% chng		% chng
2002	246.46		327.10		598.88	
2003	197.87	-20%	151.57	-54%	562.06	-6%
2004	173.36	-12%	140.40	-7%	975.18	74%
2005	131.88	-24%	123.04	-12%	1020.06	5%
2006	123.00	-7%	134.12	9%	1094.48	7%
2007	140.58	14%	150.17	12%	1135.31	4%
2008	141.33	1%	136.64	-9%	1163.07	2%
2009	149.16	6%	125.08	-8%	1146.55	-1%

**TABLE 2: Fees By Year and Window - continued****Panel B: By Window - The Percentage Reduction in Auditor Provided Tax Service Fees and Other Non-audit Fees, and the Percentage Increase in Audit Fees (n=36,809)**

	Percentage of observations with any reduction in fees	Mean values of any percentage reduction in fees	Observations
<b>APTS Fees</b>			
Pre-event data period	38.32%	-17.70%	13,780
Event window	40.14%	-21.01%	9,262
Post-event data period	31.87%	-16.22%	13,767
			<u>36,809</u>
<b>Other NAS Fees</b>			
Pre-event data period	38.59%	-22.98%	13,780
Event window	36.40%	-22.84%	9,262
Post-event data period	33.04%	-20.17%	13,767
			<u>36,809</u>
	Percentage of observations with an any increase in fees	Mean values of any percentage increase in fees	
<b>Audit Fees</b>			
Pre-event data period	76.95%	66.59%	13,780
Event window	65.07%	53.29%	9,262
Post-event data period	60.14%	34.50%	13,767
			<u>36,809</u>

Note: Panel A includes all observations in Audit Analytics with non-missing audit fee and APTS data between 2002 and 2009. Panel B includes only observations that fall within the pre-event data period, event window, and post-event data period. The pre-event data period comprises fiscal years ending December 16, 2003 through July 25, 2005. The event window comprises fiscal years beginning or ending in the period from July 26, 2005 through October 31, 2006. The post event data period comprises fiscal years beginning after October 31, 2006 (ending October 31, 2007 through July 31, 2009).

**TABLE 3: Descriptive Statistics - Matched Model (2)****Panel A: Full Sample (n = 2,374 companies)**

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
reduce	0.2380	0.4259	0.0000	0.0000	0.0000
%apts_down	0.3251	0.4058	0.7084	0.0000	0.0000
lnlast_apts	9.4172	4.4610	9.0478	10.7397	12.1900
%othernas_down	0.4832	0.4998	0.0000	0.0000	1.0000
size	6.0103	2.4015	4.4461	6.2487	7.6347
stk	0.8062	0.3953	1.0000	1.0000	1.0000
loss	0.2700	0.4441	0.0000	0.0000	1.0000
big4	0.6095	0.4880	0.0000	1.0000	1.0000
kpmg	0.1386	0.3456	0.0000	0.0000	0.0000
utb_est	0.0116	0.0071	0.0061	0.0113	0.0154
eso_ind	0.4823	0.4998	0.0000	0.0000	1.0000
foreign	0.4537	0.4980	0.0000	0.0000	1.0000
ptbi_vol	0.2495	1.4570	0.0203	0.0462	0.1037
tax_loss	0.0792	0.2701	0.0000	0.0000	0.0000
disc	0.0632	0.2433	0.0000	0.0000	0.0000

**TABLE 3: Descriptive Statistics - Matched Model (2) - continued**

**Panel B: Sample By Reduce**

Variable	Reduce (n= 565 companies)			Not reduce (n= 1,809 companies)			Difference in Mean: T-stat
	Mean	Std Dev	Median	Mean	Std Dev	Median	
%apts_down	0.9593	0.0720	1.0000	0.1270	0.2226	0.0000	137.661***
lnlast_apts	11.2188	1.6250	11.2881	8.8545	4.8953	10.5101	17.661***
%othernas_down	0.5451	0.4984	1.0000	0.4638	0.4988	0.0000	3.386***
size	6.0979	2.1307	6.2094	5.9830	2.4799	6.2855	1.075
stk	0.8496	0.3578	1.0000	0.7927	0.4055	1.0000	3.191**
loss	0.2920	0.4551	0.0000	0.2631	0.4405	0.0000	1.328
big4	0.6159	0.4868	1.0000	0.6075	0.4884	1.0000	0.358
kpmg	0.1841	0.3879	0.0000	0.1244	0.3301	0.0000	3.303***
utb_est	0.0120	0.0065	0.0121	0.0115	0.0072	0.0109	1.515
eso_ind	0.4903	0.5003	0.0000	0.4798	0.4997	0.0000	0.433
foreign	0.4938	0.5004	0.0000	0.4411	0.4967	0.0000	2.188**
ptbi_vol	0.2150	1.4049	0.0501	0.2603	1.4731	0.0448	0.662
tax_loss	0.1115	0.3150	0.0000	0.0691	0.2537	0.0000	2.918**
disc	0.0832	0.2764	0.0000	0.0569	0.2318	0.0000	2.044**

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.



**TABLE 4: Results Matched Model (2) (n=2,374 companies)**

Variable	Prediction	Coefficient	Pr >	ChiSq	Prediction	Coefficient	t-value
	dv =Reduce			dv = %apts_down			
intercept	?	-3.337***	<.0001		?	-0.032	0.3642
lnlast_apts	+	0.245***	<.0001		+	0.037***	<.0001
%othernas_down	+	0.244**	0.0176		+	0.049**	0.0016
size	+	-0.098**	0.0088		+	-0.002	0.7114
stk	+	0.529**	0.0012		+	0.051**	0.0251
loss	+	0.191	0.1487		+	0.053**	0.0075
big4	-	-0.695***	<.0001		-	-0.099***	<.0001
kpmg	+	0.685***	<.0001		+	0.112***	<.0001
utb_est	?	5.676	0.5789		?	1.067	0.4692
eso_ind	?	-0.162	0.3640		?	-0.058**	0.0291
foreign	?	-0.146	0.3174		?	0.002	0.9410
ptbi_vol	?	0.008	0.8609		?	0.009	0.1295
tax_loss	?	0.487**	0.0068		?	0.048	0.1014
disc	?	0.367*	0.0670		?	0.066**	0.0370
Industry FE		YES				YES	
P-Value		<.0001				<.0001	
R <sup>2</sup>		15.60%				17.20%	

Note: A logistic regression was used with the dependent variable, reduce, since it is an indicator variable. An ordinary least squares regression was used with the dependent continuous variable, %apts\_down. All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 5: Descriptive Statistics - Matched Sample**

Variable	Reduce (n=565 companies)			Not Reduce (n=565 companies)			Difference in Mean: T-stat
	Mean	Std Dev	Median	Mean	Std Dev	Median	
lnlast_apt	11.2188	1.6250	11.2881	11.5068	2.0200	11.3303	2.6407 **
%othernas_down	0.5451	0.4984	1.0000	0.5204	0.5000	1.0000	0.8343
size	6.0979	2.1307	6.2094	6.3879	2.5522	6.6271	2.0736 **
stk	0.8496	0.3578	1.0000	0.8531	0.3543	1.0000	0.1671
loss	0.2920	0.4551	0.0000	0.2885	0.4535	0.0000	0.1310
big4	0.6159	0.4868	1.0000	0.6496	0.4775	1.0000	1.1722
kpmg	0.1841	0.3879	0.0000	0.1805	0.3850	0.0000	0.1540
utb_est	0.0120	0.0065	0.0121	0.0120	0.0068	0.0126	0.0711
eso_ind	0.4903	0.5003	0.0000	0.4832	0.5002	0.0000	0.2379
foreign	0.4938	0.5004	0.0000	0.5168	0.5002	1.0000	0.7730
ptbi_vol	0.2150	1.4049	0.0501	0.1783	0.8689	0.0399	0.5280
tax_loss	0.1115	0.3150	0.0000	0.1044	0.3061	0.0000	0.3831
disc	0.0832	0.2764	0.0000	0.0885	0.2843	0.0000	0.3183

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 6: Descriptive Statistics Model (4)****Panel A: Full Sample (n=4,748)**

Variable	Pre-Event (n=2,374)			Post-Event (n=2,374)			Difference in Mean: T-stat
	Mean	Std Dev	Median	Mean	Std Dev	Median	
taxaq	-0.0121	0.0151	-0.0070	-0.0110	0.0120	-0.0073	2.7542**
reduce	0.2380	0.4259	0.0000	0.2380	0.4259	0.0000	0.0000
size	5.7024	2.3453	5.9355	6.0166	2.3658	6.2487	4.5955***
big4	0.6887	0.4631	1.0000	0.6095	0.4880	1.0000	5.7355***
kpmg	0.1592	0.3660	0.0000	0.1386	0.3456	0.0000	1.9980**
utb_est	0.0111	0.0068	0.0100	0.0116	0.0067	0.0113	2.7224**
eso_ind	0.4823	0.4998	0.0000	0.4823	0.4998	0.0000	0.0000
foreign	0.3981	0.4896	0.0000	0.4537	0.4980	0.0000	3.8795***
ptbi_vol	0.1930	0.5782	0.0554	0.2023	1.1566	0.0462	0.3516
tax_loss	0.0788	0.2694	0.0000	0.0792	0.2701	0.0000	0.0538
disc	0.0505	0.2191	0.0000	0.0632	0.2433	0.0000	1.8803*

**Panel B: Matched Sample (n=2,260)**

Variable	Pre-Event (n=1130)			Post-Event (n=1130)			Difference in Mean: T-stat
	Mean	Std Dev	Median	Mean	Std Dev	Median	
taxaq	-0.0129	0.0148	-0.0082	-0.0111	0.0108	-0.0077	3.3526***
reduce	0.5000	0.5002	0.5000	0.5000	0.5002	0.5000	0.0000
size	5.9930	2.2696	6.1221	6.2489	2.3302	6.3747	2.6447**
big4	0.7372	0.4404	1.0000	0.6327	0.4823	1.0000	5.3750***
kpmg	0.1982	0.3988	0.0000	0.1823	0.3863	0.0000	0.9644
utb_est	0.0115	0.0065	0.0112	0.0120	0.0063	0.0123	1.8509*
eso_ind	0.4867	0.5000	0.0000	0.4867	0.5000	0.0000	0.0000
foreign	0.4487	0.4976	0.0000	0.5053	0.5002	1.0000	2.6985*
ptbi_vol	0.1628	0.5427	0.0526	0.1370	0.4651	0.0467	1.2145
tax_loss	0.0965	0.2954	0.0000	0.1080	0.3105	0.0000	0.9025
disc	0.0593	0.2363	0.0000	0.0858	0.2803	0.0000	2.4346*

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 7: Descriptive Statistics Model (4) Spearman/Pearson Correlations**

**Panel A: Full Sample (n=4,748)**

	taxaq	reduce	post	size	big4	kpmg	utb_est	eso_ind	foreign	ptbi_vol	tax_loss	disc
taxaq	-	<b>-0.061</b>	-0.011	<b>0.036</b>	<b>-0.104</b>	0.022	<b>-0.176</b>	<b>-0.224</b>	<b>-0.256</b>	<b>-0.248</b>	<b>-0.174</b>	<b>-0.040</b>
reduce	<b>-0.042</b>	-	0.000	0.016	<b>0.050</b>	<b>0.073</b>	<b>0.045</b>	0.009	<b>0.049</b>	<b>0.044</b>	<b>0.064</b>	<b>0.044</b>
post	<b>0.040</b>	0.000	-	<b>0.069</b>	<b>-0.083</b>	<b>-0.029</b>	<b>0.045</b>	0.000	<b>0.056</b>	<b>-0.067</b>	0.001	0.027
size	<b>0.111</b>	0.027	<b>0.067</b>	-	<b>0.552</b>	<b>0.156</b>	<b>0.248</b>	<b>-0.238</b>	<b>0.317</b>	<b>-0.576</b>	0.016	<b>-0.030</b>
big4	0.002	<b>0.050</b>	<b>-0.083</b>	<b>0.561</b>	-	<b>0.308</b>	<b>0.374</b>	0.023	<b>0.357</b>	<b>-0.165</b>	<b>0.078</b>	-0.010
kpmg	0.036	<b>0.073</b>	<b>-0.029</b>	<b>0.157</b>	<b>0.308</b>	-	<b>0.039</b>	<b>-0.067</b>	<b>0.044</b>	<b>-0.113</b>	-0.011	-0.011
utb_est	<b>-0.066</b>	<b>0.037</b>	<b>0.039</b>	<b>0.152</b>	<b>0.287</b>	0.023	-	<b>0.350</b>	<b>0.709</b>	<b>0.117</b>	<b>0.065</b>	<b>-0.063</b>
eso_ind	<b>-0.182</b>	0.009	0.000	<b>-0.219</b>	0.023	<b>-0.067</b>	<b>0.329</b>	-	<b>0.287</b>	<b>0.294</b>	<b>0.069</b>	-0.019
foreign	<b>-0.100</b>	<b>0.049</b>	<b>0.056</b>	<b>0.327</b>	<b>0.357</b>	<b>0.044</b>	<b>0.604</b>	<b>0.287</b>	-	-0.012	<b>0.128</b>	-0.015
ptbi_vol	-0.021	-0.020	0.005	<b>-0.291</b>	<b>-0.141</b>	<b>-0.049</b>	<b>-0.044</b>	0.020	<b>-0.094</b>	-	<b>0.100</b>	<b>0.079</b>
tax_loss	<b>-0.135</b>	<b>0.064</b>	0.001	0.025	<b>0.078</b>	-0.011	<b>0.054</b>	<b>0.069</b>	<b>0.128</b>	-0.024	-	<b>0.049</b>
disc	<b>-0.034</b>	<b>0.044</b>	0.027	<b>-0.029</b>	-0.010	-0.011	<b>-0.057</b>	-0.019	-0.015	0.014	<b>0.049</b>	-

**TABLE 7: Descriptive Statistics Model (4) Spearman/Pearson Correlations - continued****Panel B: Matched Sample (n=2,260)**

	taxaq	reduce	post	size	big4	kpmg	utb_est	eso_ind	foreign	ptbi_vol	tax_loss	disc
taxaq	-	-0.010	0.018	<b>0.113</b>	-0.033	0.033	<b>-0.112</b>	<b>-0.186</b>	<b>-0.172</b>	<b>-0.311</b>	<b>-0.182</b>	-0.038
reduce	-0.031	-	0.000	<b>-0.072</b>	0.015	0.014	-0.005	0.007	-0.016	<b>0.090</b>	0.025	0.010
post	<b>0.070</b>	0.000	-	<b>0.061</b>	<b>-0.112</b>	-0.020	<b>0.046</b>	0.000	<b>0.057</b>	<b>-0.066</b>	0.019	<b>0.051</b>
size	<b>0.169</b>	<b>-0.064</b>	<b>0.056</b>	-	<b>0.525</b>	<b>0.183</b>	<b>0.246</b>	<b>-0.263</b>	<b>0.310</b>	<b>-0.556</b>	0.003	-0.041
big4	<b>0.046</b>	0.015	<b>-0.112</b>	<b>0.532</b>	-	<b>0.329</b>	<b>0.346</b>	0.026	<b>0.339</b>	<b>-0.167</b>	<b>0.078</b>	-0.023
kpmg	<b>0.057</b>	0.014	-0.020	<b>0.187</b>	<b>0.329</b>	-	<b>0.049</b>	<b>-0.080</b>	<b>0.077</b>	<b>-0.094</b>	-0.030	0.008
utb_est	-0.031	0.006	0.039	<b>0.169</b>	<b>0.279</b>	0.034	-	<b>0.354</b>	<b>0.728</b>	<b>0.092</b>	<b>0.058</b>	<b>-0.069</b>
eso_ind	<b>-0.156</b>	0.007	0.000	<b>-0.242</b>	0.026	<b>-0.080</b>	<b>0.332</b>	-	<b>0.250</b>	<b>0.262</b>	<b>0.095</b>	<b>-0.047</b>
foreign	-0.040	-0.016	<b>0.057</b>	<b>0.323</b>	<b>0.339</b>	<b>0.077</b>	<b>0.641</b>	<b>0.250</b>	-	-0.029	<b>0.105</b>	-0.018
ptbi_vol	<b>-0.082</b>	-0.003	-0.026	<b>-0.360</b>	<b>-0.169</b>	<b>-0.072</b>	<b>-0.041</b>	0.039	<b>-0.109</b>	-	<b>0.115</b>	<b>0.072</b>
tax_loss	<b>-0.154</b>	0.025	0.019	0.009	<b>0.078</b>	-0.030	0.040	<b>0.095</b>	<b>0.105</b>	-0.014	-	0.018
disc	<b>-0.042</b>	0.010	<b>0.051</b>	-0.037	-0.023	0.008	<b>-0.062</b>	<b>-0.047</b>	-0.018	0.006	0.018	-

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. Panels A and B present Spearman (Pearson) correlation coefficients at the top (bottom) diagonal. Correlation coefficients significant at the 5% level are in **bold**.

**TABLE 8: Results Model (4) Full Sample (n=4,748)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0124 ***	-13.62
reduce	-	-0.0017 **	-2.43
post	+	0.0007	1.60
reduce*post	?	0.0021 **	2.36
size	+	0.0000	0.23
big4	+	0.0014 **	2.38
kpmg	?	0.0000	-0.03
utb_est	-	0.1028 **	2.14
eso_ind	-	-0.0025 **	-2.65
foreign	-	-0.0008	-1.40
ptbi_vol	-	0.0001	0.23
tax_loss	-	-0.0053 ***	-6.65
disc	-	-0.0008	-0.85
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		11.25%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 9: Results Model (5) Full Sample (n=3,605)****Panel A: Regression Results**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0146***	-11.85
reduce	-	-0.0005	-0.39
post	+	-0.0006	-0.64
aggressive	?	-0.0023**	-2.81
reduce*post	?	0.0013	0.78
post*aggressive	?	0.0010	1.01
reduce*aggressive	?	-0.0001	-0.04
reduce*post*aggressive	?	0.0009	0.45
size	+	0.0008***	5.28
big4	+	0.0014**	2.26
kpmg	?	-0.0004	-0.69
utb_est	-	-0.1538**	-1.96
eso_ind	-	-0.0035**	-3.04
foreign	-	0.0015**	2.01
ptbi_vol	-	0.0001	0.15
tax_loss	-	-0.0030**	-2.93
disc	-	-0.0019	-1.63
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		17.24%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 9: Results Model (5) Full Sample (n=3,605) - continued**

**Panel B: Hypotheses 2a and 2b Test Results**

	Coefficients					F Value	Pr > F
	post	reduce* post	post* aggressive	reduce*post* aggressive	sum		
<b>Hypothesis 2a</b>							
Aggressive/Reduce	-0.00056	0.00129	0.00102	0.00089	0.00264	8.35 **	0.0039
Aggressive/ Not reduce	-0.00056		0.00102		0.00046	0.84	0.3605
Difference	0.00000	0.00129	0.00000	0.00089	0.00218	4.43 **	0.0354
<b>Hypothesis 2b</b>							
Reduce/Aggressive	-0.00056	0.00129	0.00102	0.00089	0.00264	8.35 **	0.0039
Reduce/ Not Aggressive	-0.00056	0.00129			0.00073	0.16	0.6930
Difference	0.00000	0.00000	0.00102	0.00089	0.00191	0.86	0.3550

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.



**TABLE 10: Results Model (6) Full Sample (n=4,748)****Panel A: Regression Results**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0127 ***	-13.13
reduce	-	-0.0003	-0.26
post	+	0.0008	1.16
importance	?	0.0009	1.30
reduce*post	?	0.0010	0.79
reduce*importance	?	-0.0028 *	-1.95
post*importance	?	-0.0003	-0.38
reduce*post*importance	?	0.0025	1.17
size	+	0.0000	-0.01
big4	+	0.1029 *	2.14
kpmg	?	-0.0025 **	-2.66
utb_est	-	-0.0008	-1.40
eso_ind	-	0.0001	0.26
foreign	-	-0.0052 ***	-6.62
ptbi_vol	-	-0.0008	-0.84
tax_loss	-	0.0015 **	2.46
disc	-	-0.0001	-0.10
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		11.36%	

**TABLE 10: Results Model (6) Full Sample (n=4,748) - continued**

**Panel B: Hypothesis 3 Test Results**

	Coefficients					F Value	Pr > F
	post	reduce* post	post* importance	reduce*post* importance	sum		
Important/ Reduce	0.00078	0.00099	-0.00033	0.00254	0.00398	5.07 **	0.0244
Important/ Not reduce	0.00078		-0.00033		0.00045	0.59	0.4439
Difference	0.00000	0.00099	0.00000	0.00254	0.00353	3.60 *	0.0578

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 11: Results Model (4) Matched Sample (n=2,260)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0142***	-10.28
reduce	-	-0.0016*	-1.95
post	+	0.0011	1.57
reduce*post	?	0.0019*	1.81
size	+	0.0003	1.43
big4	+	0.0017**	2.13
kpmg	?	0.0004	0.59
utb_est	-	0.0791	0.95
eso_ind	-	-0.0022**	-2.12
foreign	-	-0.0001	-0.07
ptbi_vol	-	-0.0006	-0.62
tax_loss	-	-0.0054***	-5.53
disc	-	-0.0011	-0.94
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		13.18%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 12: Results Model (5) Matched Sample (n=1,733)****Panel A: Regression Results**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0134 ***	-8.72
reduce	-	-0.0022	-1.59
post	+	0.0004	0.38
aggressive	?	-0.0023 **	-2.12
reduce*post	?	0.0005	0.29
post*aggressive	?	-0.0008	-0.57
reduce*aggressive	?	0.0006	0.36
reduce*post*aggressive	?	0.0024	1.10
size	+	0.0007 ***	3.79
big4	+	0.0015 *	1.81
kpmg	?	-0.0003	-0.56
utb_est	-	-0.1327	-1.24
eso_ind	-	-0.0029 **	-2.74
foreign	-	0.0018 *	1.77
ptbi_vol	-	-0.0016	-0.83
tax_loss	-	-0.0021 *	-1.87
disc	-	-0.0021	-1.49
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		18.22%	

**TABLE 12: continued**

**Panel B: Hypotheses 2a and 2b Test Results**

	Coefficients					F Value	Pr > F
	post	reduce* post	post* aggressive	reduce*post* aggressive	sum		
<b>Hypothesis 2a</b>							
Aggressive/ Reduce	0.00044	0.00053	-0.00080	0.00245	0.00262	10.12 **	0.0015
Aggressive/ Not reduce	0.00044		-0.00080		-0.00036	0.20	0.6529
Difference	0.00000	0.00053	0.00000	0.00245	0.00298	6.88 **	0.0088
<b>Hypothesis 2b</b>							
Reduce/ Aggressive	0.00044	0.00053	-0.00080	0.00245	0.00262	10.12 **	0.0015
Reduce/ Not Aggressive	0.00044	0.00053			0.00098	0.33	0.5640
Difference	0.00000	0.00000	-0.00080	0.00245	0.00165	0.77	0.3798

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 13: Results Model (6) Matched Sample (n=2,260)****Panel A: Regression Results**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0074 *	-1.84
reduce	-	-0.0005	-0.37
post	+	0.0014	1.18
importance	?	0.0007	0.60
reduce*post	?	0.0009	0.60
reduce*importance	?	-0.0022	-1.28
post*importance	?	-0.0005	-0.34
reduce*post*importance	?	0.0014	0.59
size	+	-0.0062	-1.61
big4	+	0.0024 ***	3.27
kpmg	?	0.0003	0.46
utb_est	-	0.0773	0.96
eso_ind	-	-0.0023 **	-2.32
foreign	-	0.0005	0.54
ptbi_vol	-	-0.0016	-1.59
tax_loss	-	-0.0054 ***	-5.46
disc	-	-0.0012	-1.02
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		13.40%	

**TABLE 13: Results Model (6) Matched Sample (n=2,260) - continued****Panel B: Hypothesis 3 Test Results**

	Coefficients					F Value	Pr > F
	post	reduce* post	post* importance	reduce*post* importance	sum		
Important/ Reduce	0.00136	0.00092	-0.00049	0.00144	0.00323	3.40*	0.0653
Important/ Not reduce	0.00136		-0.00049		0.00087	0.97	0.3241
Difference	0.00000	0.00092	0.00000	0.00144	0.00236	1.45	0.2284

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 14: Results Model (4) Subsample by Aggressive****Panel A: Full Sample - Aggressive (n=2,934)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0171***	-12.48
reduce	-	-0.0006	-0.69
post	+	0.0004	0.81
reduce*post	?	0.0022**	2.10
size	+	0.0007***	4.52
big4	+	0.0013*	1.77
kpmg	?	-0.0004	-0.68
utb_est	-	-0.1388	-1.61
eso_ind	-	-0.0042**	-3.01
foreign	-	0.0020**	2.26
ptbi_vol	-	0.0003	0.41
tax_loss	-	-0.0023**	-2.19
disc	-	-0.0017	-1.32
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		18.73%	



**TABLE 14: Results Model (4) Subsample by Aggressive - continued****Panel B: Full Sample - Not Aggressive (n=671)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0135***	-6.34
reduce	-	-0.0001	-0.11
post	+	-0.0007	-0.77
reduce*post	?	0.0010	0.63
size	+	0.0009**	2.66
big4	+	0.0014	1.07
kpmg	?	-0.0004	-0.45
utb_est	-	-0.2609	-1.35
eso_ind	-	-0.0006	-0.38
foreign	-	0.0009	0.63
ptbi_vol	-	-0.0060	-1.06
tax_loss	-	-0.0087**	-2.16
disc	-	-0.0027	-0.96
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		13.65%	

**TABLE 14: Results Model (4) Subsample by Aggressive - continued****Panel C: Matched Sample - Aggressive (n=1,398)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.016***	-9.20
reduce	-	-0.002*	-1.67
post	+	0.000	-0.52
reduce*post	?	0.003**	2.49
size	+	0.001***	3.86
big4	+	0.001	0.78
kpmg	?	0.000	-0.11
utb_est	-	-0.143	-1.22
eso_ind	-	-0.003**	-2.34
foreign	-	0.002	1.60
ptbi_vol	-	-0.001	-0.49
tax_loss	-	-0.002	-1.58
disc	-	-0.002	-1.36
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		19.26%	

**TABLE 14: Results Model (4) Subsample by Aggressive - continued****Panel D: Matched Sample - Not Aggressive (n=335)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0126***	-4.63
reduce	-	-0.0016	-1.36
post	+	0.0012	0.93
reduce*post	?	-0.0003	-0.17
size	+	0.0003	0.95
big4	+	0.0053**	3.11
kpmg	?	-0.0008	-0.75
utb_est	-	-0.2805	-1.35
eso_ind	-	-0.0026**	-2.11
foreign	-	0.0027*	1.80
ptbi_vol	-	-0.0105	-1.49
tax_loss	-	-0.0039	-0.62
disc	-	-0.0026	-0.83
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		18.57%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 15: Results Model (4) Subsample by Importance****Panel A: Full Sample - Important (n=2,343)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0113 ***	-8.89
reduce	-	-0.0030 **	-3.12
post	+	0.0004	0.72
reduce*post	?	0.0029 *	1.65
size	+	0.0001	0.49
big4	+	0.0009	1.12
kpmg	?	0.0002	0.27
utb_est	-	0.0314	0.37
eso_ind	-	-0.0031 **	-2.16
foreign	-	0.0006	0.72
ptbi_vol	-	-0.0003	-0.29
tax_loss	-	-0.0053 ***	-4.86
disc	-	0.0001	0.09
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		15.96%	

**TABLE 15: Results Model (4) Subsample by Importance****Panel B: Full Sample - Not Important (n=2,405)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0125 ***	-9.05
reduce	-	-0.0003	-0.28
post	+	0.0009	1.32
reduce*post	?	0.0010	0.84
size	+	-0.0001	-0.70
big4	+	0.0018 **	1.98
kpmg	?	-0.0002	-0.32
utb_est	-	0.1236 **	2.13
eso_ind	-	-0.0021 *	-1.66
foreign	-	-0.0017 **	-2.18
ptbi_vol	-	0.0001	0.19
tax_loss	-	-0.0051 ***	-4.43
disc	-	-0.0013	-1.05
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		8.84%	

**TABLE 15: Results Model (4) Subsample by Importance - continued****Panel C: Matched Sample - Important (n=1,120)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0030	-0.58
reduce	-	-0.0025 **	-2.28
post	+	0.0007	0.84
reduce*post	?	0.0023	1.20
size	+	-0.0086 *	-1.77
big4	+	0.0024 **	2.37
kpmg	?	-0.0004	-0.41
utb_est	-	-0.1825	-1.34
eso_ind	-	-0.0044 ***	-3.40
foreign	-	0.0032 **	2.32
ptbi_vol	-	-0.0027 *	-1.96
tax_loss	-	-0.0056 ***	-3.91
disc	-	-0.0012	-0.71
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		15.68%	

**TABLE 15: Results Model (4) Subsample by Importance - continued****Panel D: Matched Sample - Not Important (n=1140)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
intercept	?	-0.0126**	-2.04
reduce	-	-0.0005	-0.40
post	+	0.0014	1.25
reduce*post	?	0.0009	0.62
size	+	-0.0023	-0.38
big4	+	0.0020*	1.81
kpmg	?	0.0009	1.06
utb_est	-	0.2398**	2.40
eso_ind	-	-0.0014	-1.27
foreign	-	-0.0013	-1.25
ptbi_vol	-	-0.0007	-0.49
tax_loss	-	-0.0051***	-3.81
disc	-	-0.0016	-1.00
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		12.29%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

**TABLE 16: Results Model (4) Controlling for Audit Effort**

**Panel A: Full Sample (n=4,748)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
Intercept	?	0.0096***	3.65
reduce	-	-0.0017**	-2.43
post	+	0.0008*	1.94
reduce*post	?	0.0021**	2.25
size	+	0.0015***	9.45
big4	+	0.0006	1.06
kpmg	?	0.0006	1.12
utb_est	-	0.1143**	2.37
eso_ind	-	-0.0039***	-5.94
foreign	-	-0.0013**	-2.21
ptbi_vol	-	0.0003	0.70
tax_loss	-	-0.0053***	-6.68
disc	-	-0.0007	-0.74
lnaud_fee	+	-0.0021***	-7.71
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		9.10%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.



**TABLE 16: Results Model (4) Controlling for Audit Effort****Panel B: Matched Sample (n=2,260)**

<b>dv = taxaq</b>			
<b>Variable</b>	<b>Prediction</b>	<b>Coefficient</b>	<b>t value</b>
Intercept	?	-0.0068	-1.46
reduce	-	-0.0016*	-1.92
post	+	0.0012*	1.71
reduce*post	?	0.0019*	1.81
size	+	0.0006**	1.99
big4	+	0.0019**	2.37
kpmg	?	0.0004	0.58
utb_est	-	0.0910	1.08
eso_ind	-	-0.0021**	-2.04
foreign	-	0.0002	0.21
ptbi_vol	-	-0.0005	-0.49
tax_loss	-	-0.0054***	-5.47
disc	-	-0.0010	-0.86
lnaud_fee	+	-0.0008	-1.59
Industry FE		YES	
P-Value		<.0001	
R <sup>2</sup>		13.30%	

Note: All variables are defined in Appendix B and continuous variables are winsorized at 1% and 99%. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level (two-tailed), respectively.

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