EFFECTS OF AUDITOR-PROVIDED TAX SERVICES ON BOOK-TAX DIFFERENCES

AND INVESTORS' MISPRICING OF BOOK-TAX DIFFERENCES

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In this study, I investigate the effect of auditor-provided tax services (ATS) on firms' levels of book-tax differences and investors' mispricing of book-tax differences. The joint provision of audit and tax services has been a controversial issue among regulators and academic researchers. Evidence on whether ATS improve or impair the overall accounting quality is inconclusive as a result of the specific testing circumstances involved in different studies. Book-tax differences capture managers' earnings management and/or tax avoidance intended to maximize reported financial income and to minimize tax expense. Therefore, my first research question investigates whether ATS improve or impair audit quality by examining the relation between ATS and firms' levels of book-tax differences. My results show that ATS are negatively related to book-tax differences, suggesting that ATS improve the overall audit quality and reduce aggressive financial and/or tax reporting.

My second research question examines whether the improved earnings quality for firms acquiring ATS leads to reduced mispricing of book-tax differences among investors. Recent studies document that despite the rich information about firms' future earnings contained in book-tax differences, investors process such information inefficiently, leading to systematic pricing errors among firms with large book-tax differences. My empirical evidence indicates that ATS mitigate such mispricing, with pricing errors being lower among firms acquiring ATS compared with firms without ATS. Collectively, these results support the notion that ATS improve audit quality through knowledge spillover. Moreover, the improved earnings quality among firms acquiring ATS in turn helps reduce investors' mispricing of book-tax differences.

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CHAPTER 1

INTRODUCTION

In this study, I investigate the relation between auditor-provided tax services (ATS) and firms' levels of book-tax differences and the relation between ATS and investors' mispricing of book-tax differences. Recent studies document that investors do not efficiently process information on future earnings contained in book-tax differences, leading to systematic pricing errors among firms with large book-tax differences (Lev and Nissim 2004; Weber 2009; Chi et al. 2014). Chi et al. (2014) attribute the mispricing to investors' limited attention. Indeed, evaluating information in book-tax differences on future earnings is difficult because taxable income is confidential and can only be estimated from financial statement data. Hence, ordinary investors generally ignore such information and tend to focus only on the book income reported in the financial statements. Therefore, I expect that, if the joint provision of audit and tax services affects audit quality and client firms' earnings persistence, the presence or absence of such joint services should mitigate or exacerbate the levels of the investors' mispricing of future earnings among firms with ATS, especially those with large book-tax differences.

Though book income is easily accessible to investors through a firm's financial statements, it is an imperfect measure of firm performance since a substantial amount of managerial discretion is allowed during its calculation under generally accepted accounting principles (GAAP) (Watts and Zimmerman 1983; Dechow et al. 2010). Taxable income, on the other hand, is subject to the tax law and is reported to the tax authorities. Managers, therefore, have incentives to take advantage of the differences between the two standards in order to maximize book income without increasing taxable income and/or to minimize taxable income without decreasing book income (Desai 2005). The differences between book income and

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taxable income are book-tax differences. Book-tax differences, especially temporary book-tax differences, tend to capture earnings management and/or tax minimization and can provide information about earnings persistence beyond the information contained in accruals (Blaylock et al. 2012). Despite the rich information contained in book-tax differences, estimating this number is difficult since taxable income is confidential. Processing information contained in book-tax differences requires investors to devote a considerable amount of cognitive power to the task because drawing inferences about future valuation requires estimating the book-tax differences from the financial statements and correctly identifying the temporary book-tax differences (Chi et al. 2014). As a consequence, investors with limited attention generally ignore the information in book-tax differences and pay high prices for high book income firms and low prices for low book income firms. However, large temporary book-tax differences are likely to reverse in future periods and produce less persistent earnings than firms with small temporary book-tax differences (Hanlon 2005). Without considering the underlying book-tax differences, investors are less likely to detect the managerial discretion associated with firms having large temporary book-tax differences. In fact, a simple trading strategy based on book-tax differences, i.e., short firms with large book-tax differences and long those with small book-tax differences could earn economically significant hedge returns after adjusting for standard risk factors (Chi et al. 2014).

The joint provision of audit and non-audit services has been a controversial issue among regulators and academic researchers. The main concern of regulators is that providing non-audit services increases the economic bond between the auditor and its clients and potentially impairs audit quality. Following the Enron scandal, the Sarbanes-Oxley Act (SOX) of 2002 banned most non-audit services, but ATS are among the few non-audit services still allowed in the post-SOX

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period. In 2005, the Securities and Exchange Commission (SEC) further limited the provision of certain types of ATS as suggested by the Public Company Accounting Oversight Board (PCAOB). However, despite the regulators' claim that non-audit services increase the economic bonding between auditors and client firms, academic evidence on this issue has been inconclusive. With respect to ATS, one recent study finds evidence consistent with the regulators' view that providing ATS impairs auditor independence and might lead to more lenient financial-statement audits (Omer et al. 2006). Yet several other studies find contradictory evidence and suggest that joint provision of audit and tax services improves the quality of audited financial statements (Kinney et al. 2004; Gleason and Mills 2011; Krishnan and Visvanathan 2011) and enhances the value relevance of earnings (Krishnan et al. 2013). These studies argue that ATS facilitate the knowledge spillover and, therefore, enhance audit quality since the insights gained from the tax services could in turn improve the financial-statement audits.

My study first examines the relation between ATS and firms' levels of book-tax differences and contributes to the growing literature on the consequences of ATS on the overall accounting quality. Prior studies primarily focus on the separate effect of ATS on either the quality of reported earnings or the firms' levels of tax avoidance. Moreover, the evidence reported by different studies is inconclusive because of their respective testing circumstances. Given that managers have incentives to take advantage of the differences between the standards involved in financial reporting and in tax reporting, book-tax differences, especially temporary book-tax differences, tend to capture related earnings management and/or tax avoidance. Therefore, this study investigates whether ATS systematically affect a firm's overall level of management of its book income and tax.

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This study further examines the relation between ATS and investors' mispricing of book-tax differences and contributes to the line of research studying the implications of book-tax differences. Research on book-tax differences suggests that the difference between book income and taxable income contains information about firms' current and future valuation (Hanlon 2005; Blaylock et al. 2012). However, literature on mispricing of book-tax differences suggests that ordinary investors and even some sophisticated analysts do not value book-tax differences efficiently and misjudge the persistence of temporary book-tax differences (Weber 2009; Chi et al. 2014). My study extends the line of research on this book-tax anomaly by studying the effect of ATS on the association between book-tax differences and firms' future stock returns. Collectively, the findings reported in this study should be of value to investors and regulators and are relevant to the ongoing debate on whether ATS should be allowed.

Given the above, I first test whether ATS are systematically related to firms' temporary book-tax differences. I partition firm-year samples into two subsamples according to whether a given firm acquires ATS during a specific year. I then test for differences in levels of temporary book-tax differences between the two subsamples. On the one hand, if ATS can enhance audit quality and limit firms' book/tax income management via knowledge spillover, I expect lower levels of temporary book-tax differences among firms purchasing ATS compared with those who do not. On the other hand, if ATS compromise auditor independence and increase managerial discretion on book and/or taxable income, I expect higher levels of temporary book-tax differences among firms purchasing ATS compared with those who do not.

I then test whether ATS can help investors better price firms' future earnings and reduce the mispricing of book-tax differences among firms purchasing ATS. Specifically, I regress the one-year-ahead adjusted buy-and-hold returns on the interaction between ATS and temporary

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book-tax differences, along with the main effects of temporary book-tax differences and ATS and other variables controlling firm, year, and industry characteristics. I examine the sign of the regression coefficient associated with the interaction term to test my hypothesis. If ATS result in higher levels of earnings quality[1], I expect that the improved persistence in book income will mitigate investors' mispricing of book-tax differences, resulting in a positive coefficient associated with the interaction term. If ATS result in lower levels of earnings quality, I expect that the decreased persistence in book income will exacerbate the level of mispricing, giving rise to a negative coefficient on the interaction term.

Using data from 2000-2013, I find empirical evidence that firms receiving ATS have lower levels of temporary book-tax differences, suggesting that ATS improve earnings quality. Moreover, my results indicate that investors' mispricing of book-tax differences is reduced among firms acquiring ATS. The empirical evidence is consistent with the view that providing ATS enhance audit quality and limit firms' management of book and/or taxable income via knowledge spillover. The improved earnings quality as a result of ATS further helps investors to better price those firms with ATS.

The remainder of this proposal proceeds as follows. In Chapter 2, I discuss the background and review relevant literature. In Chapter 3, I develop my hypotheses. In Chapter 4, I describe my research design and my sample-selection procedure. In Chapter 5, I present the results. Finally, I conclude in Chapter 6.

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[1] Earnings quality is not directly observable, so various measures have been developed as proxies or indicators for earnings quality (Dechow et al. 2010). In this study, I mainly focus on the earnings persistence aspect of the earnings quality.

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CHAPTER 2

BACKGROUND AND LITERATURE REVIEW

In this chapter, I first review the background literature on auditor-provided non-audit services and audit quality. I then review the literature on book-tax differences.

Auditor-Provided Non-Audit Services and Audit Quality

The provision of non-audit services by auditors has been a controversial issue for the past three decades because of its potential to increase the economic bonding between auditors and clients, which can cause auditors to act more favorably towards their clients and impair audit quality. Over the years, U.S. regulators have imposed a series of disclosure requirements for firms' procuring non-audit services in an effort to minimize the economic dependency between auditors and clients incurred by such services. For example, in 1978, the SEC issued Accounting Series Release No. 250, requiring firms procuring non-audit services to disclose (1) the total non-audit fees as a percentage of the audit fees, (2) the specific nature of non-audit services, and (3) a breakdown of each non-audit service in excess of three percent of audit fees (Schneider et al., 2006). However, the SEC rescinded the disclosure requirement in 1982[2], and, in 2000, a new requirement called for separate fee disclosures for three types of services: (1) audit services, (2) financial information system design and implementation services, and (3) all other non-audit services (Schneider et al. 2006).

The Enron scandal, considered at the time as the biggest audit failure in modern U.S. history (Brattom 2002), brought the controversy over non-audit services to its climax. Enron's audit firm, Arthur Andersen, knowingly ignored and destroyed evidence pertaining to Enron's

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[2] The SEC rescinded it in 1982 by concluding that investors were not interested in the fee disclosures (Schneider et al. 2006) because the median non-audit fees accounted for only fourteen percentage of the audit fees during the time period this disclosure requirement was in effect (Hackenbrack 2004).

accounting malpractice because of the firm's dual provision of audit and business consulting services to Enron. In response to this accounting crisis, SOX of 2002 set new standards for auditor independence and prohibited most types of non-audit services[3] (Gray and Manson 2008). However, despite the strong regulatory sanction against non-audit services, most of the auditor-provided tax services are still allowed post-SOX. The tax services banned by SOX mainly involved client advocacy, such as representing a client in a tax court, because of the higher perceived risk of impairing auditor independence (SEC 2002). In 2005, the SEC further limited the provision of certain types of ATS[4] as suggested by the Public Company Accounting Oversight Board (PCAOB).

The widespread controversy over non-audit services also attracted substantial research interests among academic researchers. Extensive literature examines the impact of non-audit services on auditor independence and on firms' financial reporting quality. The theoretical foundation of the research regarding the impact of non-audit services on auditor independence is rooted in the quasi-rents[5] model developed in DeAngelo (1981). Assuming that auditors are rational wealth maximizers, this model suggests that auditor independence is negatively related to client-specific quasi-rents with higher amounts of quasi-rents indicating a stronger economic incentive for auditors to compromise independence and to retain such quasi-rents. Since non-audit services typically provide higher profit margin and hence higher quasi-rents than audit

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[3] The non-audit services banned by SOX include the following: (1) bookkeeping and other services related to accounting records or financial statements, (2) financial information system design and implementation services, (3) appraisal or valuation services, fairness opinions, or contribution-in-kind reports, (4) actuarial services, (5) internal audit outsourcing services, (6) management functions or human resources, (7) broker or dealer, investment adviser, or investment banking services, (8) legal services and expert services, and (9) any other service that the Board determines, by regulation, is impermissible.

[4] The following types of ATS have been prohibited since 2005: contingent-fee arrangements, tax marketing, planning or advice in favor of tax treatments considered confidential or based on an aggressive interpretation of the tax code, tax services to managers who have financial reporting oversight roles at an audit client, or tax services to the immediate family members of such managers (Laffie 2006).

[5] Quasi-rents are defined as "the excess of revenues over avoidable costs, including the opportunity cost of auditing the next-best alternative client" (DeAngelo 1981).

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services do, they may have a detrimental effect on auditor independence (Lindberg and Beck 2004).

Prior studies have examined the impact of non-audit services on auditor independence, both *in appearance* and *in fact*. With respect to auditor independence in appearance, this line of research focuses on investigating the effects of non-audit services on investors' perception of auditor independence and on market valuations of audited financial earnings. Except for Ghosh et al. (2009) who find no relation between stock returns and the non-audit fee ratio, other studies generally find evidence consistent with the theoretical prediction that investors perceive non-audit services as a sign of impaired auditor independence. For example, using non-audit fee ratio and the absolute level of non-audit fees as inverse indicators for auditor independence, Krishnan et al. (2005) find that the earnings response coefficients (ERCs) decrease when the ratio of non-audit fees and the absolute level of non-audit fees increase. Similarly, Francis and Ke (2006) report a negative association between the level of non-audit fees and the market valuation of quarterly earnings surprises. Khurana and Raman (2006) document that the cost of equity capital is significantly higher for firms with non-audit services than those without non-audit services. Finally, examining Andersen's clients, Krishnamurty et al. (2006) find that the negative abnormal returns experienced by Andersen's clients during the indictment of the auditor are more negative for those clients that have received higher amount of non-audit services. Specific to ATS, it is worth noting that prior studies fail to find evidence suggesting that ATS are perceived as threats to auditor independence (Krishnan et al. 2013). Focusing on equity investors' perception of ATS, Krishnan et al. (2013) find that investors actually assign a higher valuation to firms that use their auditors for tax services. This result demonstrates the necessity

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of separating the discussion on ATS from other non-audit services in light of their different influences on auditor independence.

With respect to auditor independence in fact, studies have typically examined whether non-audit services lead to increased earnings management and/or financial statement restatements, both potential outcomes of compromised auditor independence (Schneider et al. 2006; Habib 2012). However, evidence reported by different studies in this area is inconclusive with some studies suggesting impaired auditor independence by non-audit services while others do not. One of the earliest studies implying impaired auditor independence by non-audit services is Frankel et al. (2002), which documents a positive association between non-audit fees and the magnitude of absolute discretionary accruals. This result is taken as evidence that auditors are more likely to acquiesce to client pressure when the provision of non-audit services generates economic rents. Consistent with the U.S. evidence reported in Frankel et al. (2002), Ferguson et al. (2004) also find that, among UK firms, non-audit services are positively related to discretionary accruals and financial statement restatements. Examining the banking industry, Kanagaretnam et al. (2011) find that small commercial banks that pay higher abnormal non-audit fees are involved in higher levels of earnings management.

Despite the above evidence, another host of studies generally fails to find evidence relating non-audit services to impaired auditor independence. For example, using the same sample as in Frankel et al. (2002), Ashbaugh et al. (2003) fail to find a systematic association between non-audit services and earnings management after adjusting discretionary current accruals for company performance. Similarly, after controlling industry-specific effects for tests in Frankel et al. (2002), Chung and Kallapur (2003) find no association between non-audit fees and abnormal accruals. Antle et al. (2002) find no evidence of a positive relation between non-

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audit services and abnormal accruals for UK firms. Further, examining the association between non-audit services and financial statement restatement in the U.S., two studies fail to find a significant relation between restatements and non-audit services (Raghunandan et al. 2003; Agrawal and Chadha 2005). Moreover, studies often document a negative association between non-audit services and earnings management and attribute this negative association to the knowledge spillover view that client-specific knowledge gained from non-audit services can in turn improve audit quality (Simunic 1984; Beck et al. 1988; Arrunada 1999; Antle et al. 2006). In support, Beck et al. (1988) split non-audit services into recurring and non-recurring services and suggest that recurring non-audit services provide knowledge spillover and reduce the threat to independence.

Prior literature specifically investigating the effect of ATS on auditor independence and audit quality also provides mixed results. The empirical evidence from Omer et al. (2006) that ATS lead to more lenient financial statement audits and the claim made in Maydew and Shackelford (2007) that ATS increase corporate tax avoidance demonstrates a negative relation between ATS and auditor independence. In contrast, several other studies support the knowledge spillover hypothesis and indicate that ATS are related to less earnings management (Choi et al 2009), lower likelihood of financial statement restatements (Kinney et al. 2004) and tax-related restatements (Seetharaman et al. 2011), and lower likelihood of reporting a small profit to avoid earnings loss (Krishnan and Visvanathan 2011). With respect to ATS's effect on tax avoidance, Krishnan and Visvanathan (2011) are the first to provide empirical evidence suggesting that ATS do not contribute to corporate tax avoidance, which contradict the prediction in Maydew and Shackelford (2007).

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In summary, empirical evidence on the relation between non-audit services and auditor independence and financial reporting quality is inconclusive. Specifically to ATS, different studies have shown evidence supporting either the quasi-rents model or the knowledge spillover hypothesis. Hence, the impact of ATS on temporary book-tax differences examined in this study is an empirical question.

Book-Tax Differences

Book-Tax Differences and Earnings Quality

Each year, management calculates two types of income: (1) book income and (2) taxable income. While book income is calculated under GAAP for financial reporting purposes, taxable income is subject to the tax law with the main purpose of raising government revenue. These two types of incomes generally differ, and the differences between the two are referred to as book-tax differences. These differences between book income and taxable income can be either permanent or temporary. Permanent book-tax differences are the result of mechanical differences between GAAP and the tax law. For example, municipal bond interest is recognized in financial statements, yet it has no tax consequences because it is tax exempt. Alternatively, temporary differences between book income and taxable income arise because of the different levels of managerial discretion allowed during the calculation of those two types of incomes (e.g., using different depreciation methods for book income and taxable income). GAAP provide managers with a substantial amount of discretion in selecting different accounting methods to record revenue and expense items. Such differences do not necessarily affect book and taxable income in the same period. For example, managers may choose between different rates of cost amortization or select different periods to record reserve allowances to achieve short-term

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earnings goals (Mills and Newberry 2001). In contrast, the calculation of taxable income allows less discretion. As a result of those managerial selections, the different timing in recording book and taxable income components will create deferred tax expenses or benefits and generate temporary book-tax differences. Hence, temporary book-tax differences capture managerial discretion.

In general, managers have incentives to manage book income upward without affecting taxable income and to manage taxable income downward without affecting book income. Therefore, when a firm has large positive book-tax differences, its management may have treated one or both of its income measures opportunistically. With respect to the relation between book-tax differences and earnings management, empirical studies in general support this view and find systematic associations between book-tax differences and proxies of earnings management and earnings quality. For example, Lev and Nissim (2004) show that a higher ratio of taxable-to-book income, i.e., smaller book-tax differences, is associated with higher future earnings growth. Hanlon (2005) reports a negative association between a firm's future earnings persistence and its level of temporary book-tax differences. Extending Hanlon (2005), Blaylock et al. (2012) find that the lower earnings persistence in firms with large temporary book-tax differences is mainly driven by upward earnings management rather than by tax minimization. Phillips et al. (2003) provide empirical evidence that large positive temporary book-tax differences are more likely to be experienced in firms that just meet or exceed their earnings target, suggesting that firms manage book income upward to please the market. Additionally, studies have shown that book-tax differences could be used to identify firms in financial distress (Jones and Noga 2013), detect a firm's earnings fraud (Ettredge et al. 2008), and predict its earnings restatements (Badertscher et al. 2009).

Prior empirical evidence also supports the positive association between book-tax differences and tax avoidance. For example, Mills (1998) suggests that large positive book-tax differences are positively related to high levels of tax non-compliance. Several subsequent studies further document that the increase in book-tax differences over the 1990s is partly attributable to increased levels of corporate tax sheltering (Manzon and Plesko 2002; Mills et al. 2003; Plesko 2004). In addition, Wilson (2009) and Frank et al. (2009) find that firms identified as engaging in tax sheltering activities have relatively large book-tax differences. Consistent with the U.S. evidence reported in Wilson (2009) and Frank et al. (2009), Cho et al. (2006) suggest a similar finding in New Zealand.

In summary, prior studies find that book-tax differences, especially temporary book-tax differences, likely result from upward earnings management and/or tax avoidance. Some accounting researchers and policymakers hence suggest making book income and taxable income conform to each other to reduce compliance costs (e.g., Murray 2002; Desai 2003; Desai 2005; Desai 2006; Rossotti 2006). This conformity can curb earnings management and tax avoidance since, on the one hand, overstated earnings will inevitably incur higher taxes, and tax sheltering, on the other hand, will lower earnings reported to investors. Yet, opponents claim that book-tax conformity would possibly cause a loss of information to external investors (Hanlon et al. 2005; Shackelford 2006; McClelland and Mills 2007; Hanlon and Maydew 2009). Book-tax differences capture managerial discretions beyond those reflected in discretionary accruals (Hanlon 2005; Blaylock et al. 2012). Supplementing book income with taxable income can provide more information about future earnings and firm valuations than each does by itself (Dhaliwal et al. 2012). Therefore, studying whether and how investors utilize such information when pricing firms is important.

Limited Attention and Mispricing of Book-Tax Differences

As discussed above, book-tax differences, especially temporary book-tax differences, provide rich information about a firm's future earnings persistence. However, two recent studies (Weber 2009; Chi et al. 2014) document that ordinary investors, and even some sophisticated analysts, fail to correctly interpret or incorporate the information contained in book-tax differences when pricing firms' current and future earnings. Temporary book-tax differences tend to reverse in the period after the deferred tax expenses/benefits are recognized in the financial statements (Hanlon 2005). Therefore, as pointed out in Hanlon (2005), firms with higher levels of temporary book-tax differences have lower earnings persistence. Chi et al. (2014) further show that a simple trading strategy, long in firms with the smallest book-tax differences and short in firms with the largest book-tax differences, consistently generates economically significant hedge returns. If investors do not incorporate information contained in temporary book-tax differences and only price firms according to book income, their trading strategies are suboptimal and will lead to systematic mispricing. Weber (2009) and Chi et al. (2014) suggest that the mispricing of book-tax differences cannot be explained by differences in risk factors associated with firms with different levels of book-tax differences. In addition, factors related to accrual anomaly cannot fully explain such mispricing (Chi et al. 2014).

Chi et al. (2014) attribute mispricing to investors' limited attention. Limited attention underlines the idea that attention is selective in nature and that such selectivity is "a necessary consequence of the vast amount of information available in the environment, and of limits to information processing power" (Kahneman 1973). In the face of limited cognitive processing resources, people tend to underweight abstract, statistical, and base-rate information (Kahneman and Tversky 1973; Nisbett and Ross 1980) and rely heavily on simple heuristics in making

decisions (Libby et al. 2002). Consistent with this idea, Hirshleifer and Teoh (2003) show that constraints on information processing often limit investors to fixate on the Price-Earnings (PE) ratio while valuing a firm. When investors price book-tax differences, they require a considerable amount of cognitive power to estimate the taxable income from the financial statement data and to extract the temporary book-tax differences from the total book-tax differences (Chi et al. 2014). Consequently, investors with limited attention may fail to estimate book-tax differences precisely and are likely to ignore the information in book-tax differences and to typically pay relatively high prices for high book income firms and relatively low prices for low book income firms.

CHAPTER 3

HYPOTHESES DEVELOPMENT

H1 Development: Auditor-Provided Tax Services and Temporary Book-Tax Difference

Prior research examining the effect of ATS on audit quality provides contradictory results. On the one hand, the joint provision of audit and tax services inevitably generates higher amount of quasi-rents thereby increasing the threat to auditor independence and prompting auditors to yield to pressures from clients. This implies that auditors have less incentive to curb earnings management. In addition, auditors who provide tax services are more likely to accept understatement of taxable income. As pointed out by several participants at the PCAOB's roundtable, one of the main concerns of joint provisions is that if the aggressive recommendation comes from the tax department of the audit firm rather than from an external service provider, it is less likely that the auditor will scrutinize the clients' tax positions closely or call that recommended position into question (PCAOB 2004). Accordingly, their clients may not be required to record large contingency reserves related to those positions, resulting in more tax avoidance.

Hence, I expect that if ATS impair auditor independence and lead to more lenient auditing, client firms with ATS are more likely to opportunistically manage book income up and/or taxable income down than their counterparts without ATS. Such increased levels of earnings management and/or tax minimization are likely to be captured by large temporary book-tax differences. Given the above, I expect that if ATS lead to impaired auditor independence, firms receiving ATS will have higher levels of temporary book-tax differences than firms that do not receive ATS.

On the other hand, the knowledge spillover hypothesis posits that joint provision of audit and tax services can promote information sharing between the audit and tax sides of services, and, therefore, knowledge gained from the financial statement audits can improve the quality of tax services and vice versa. It has been suggested that firms with aggressive financial reporting strategies also tend to be aggressive in tax reporting (Frank et al. 2009). Thus, knowledge of aggressive tax planning strategies can inform the auditor about the managers' general attitude toward financial reporting. With such pre-knowledge, the auditor can better focus audit procedures to detect the managers' potential earnings management activities, thereby enhancing audit effectiveness. As indicated by prior studies, the improved audit quality can lead to lower management of book income (e.g., Kinney et al. 2004; Choi et al. 2009; Krishnan and Visvanathan 2011). Further, ATS allow auditors to review their clients' quarterly tax statements so that auditors have opportunities to examine deferred tax expenses and uncover controversial issues (Ettredge et al. 2008; Krishnan and Visvanathan 2011). This might act to reduce firms' tax minimization and further constrain managers' manipulation of earnings through taxes expenses (Dhaliwal et al. 2004; Christensen et al. 2013). Hence, if upward earnings management and tax minimization are reduced by ATS, I expect temporary book-tax differences to be smaller for firms that acquire ATS than for those that do not acquire ATS. Although Krishnan and Visvanathan (2011) find no evidence suggesting an association between ATS and short-term tax avoidance, it is likely that the reduced earnings management will still be sufficient to decrease temporary book-tax differences among firms acquiring ATS.

Based on the above, whether or not ATS will have any effect on temporary book-tax differences is an empirical question. Hence, my first hypothesis is stated as follows in the non-directional form:

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H1: All else equal, auditor-provided tax services are systematically associated with firms' levels of temporary book-tax differences.

H2 Development: Auditor-Provided Tax Services and Mispricing of Book-Tax Differences

Estimating and correctly pricing temporary book-tax differences are difficult and require a considerable amount of cognitive resources (Chi et al. 2014). Consistent with this notion, investors with limited attention, and also some sophisticated analysts, tend to misprice the earnings information in temporary book-tax differences (Weber 2009; Chi et al. 2014). They typically pay close attention to book income and price firms accordingly. If ATS impair auditor independence and lead to more aggressive financial reporting, the increased earnings management could lead to lower earnings quality and earnings persistence among firms procuring ATS compared with firms that do not procure ATS. Hence, I expect that lower earnings persistence among firms procuring ATS will increase investors' difficulty in predicting the future earnings of such firms, leading to increased mispricing of temporary book-tax differences. Alternatively, if ATS improve audit quality through knowledge spillover and lead to more persistent earnings, I expect that investors will be able to better predict future earnings and reduce the mispricing of temporary book-tax differences among firms procuring ATS.

Given the above, my second hypothesis is stated as follows in the non-directional form:

H2: All else equal, auditor-provided tax services are systematically associated with investors' mispricing of book-tax differences.

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CHAPTER 4

EMPIRICAL DESIGN

Testing H1: Impact of Auditor-Provided Tax Services on Temporary Book-Tax Differences

The following regression model[6] (Eq.1) is used to test my first hypothesis on whether

firms acquiring tax services from their auditors are associated with higher or lower amounts of

temporary book-tax differences compared with firms that do not receive auditor-provided tax

services:

$$\text{TEMP}_{it} / A_{it-1} = \alpha_0 + \beta_1 (\text{ATS}_{it}) + \beta_2 (\text{AbAcc}_{it}) + \beta_3 (\text{Cash3ETR}_{it}) + \beta_4 (\text{TEMP}_{it-1} / A_{it-2})$$

$$+ \beta_5 (\text{LEV}_{it}) + \beta_6 (\text{GROWTH}_{it}) + \Sigma \text{ IND} + \Sigma \text{ YEAR} + \varepsilon_{it1} \qquad (1)$$

where:

$\text{TEMP}_{it} / A_{it-1}$ = temporary book-tax differences for firm i in year t, scaled by total assets at the

beginning of year t for firm i;

ATS_{it} =1 if firm i has auditor-provided tax services during year t; and 0 otherwise;

AbAcc_{it} = abnormal accruals for firm i in year t;

Cash3ETR_{it} = ratio of the sum of cash taxes paid over the previous 3 years to the sum of pretax

financial accounting income over the previous 3 years for firm i in year t;

$\text{TEMP}_{it-1} / A_{it-2}$ = temporary book-tax differences for firm i in year $t-1$, scaled by total assets at the

beginning of year $t-1$ for firm i;

LEV_{it} = ratio of total liabilities to total assets for firm i in year t;

---

[6] I estimate this model and all other models in this paper using Robust Regression analysis in order to minimize the potential impact of outlier observations. As recommended by Leone et al. (2013), Robust Regression significantly reduces the bias in regression coefficients, and is preferable to winsorization or truncation typically used in the OLS Regression.

GROWTH$_{it}$ = percentage change in sales for firm i from year $t\text{-}1$ to year t;

IND = industry dummies based on Fama and French's 48 industries classifications;

YEAR = year dummies from year 2000 to 2013.

Dependent Variable

The dependent variable in Eq. (1) is the temporary book-tax differences for firm i in year t. Following Hanlon (2005) and Hanlon et al. (2012), I estimate the temporary book-tax differences (TEMP) by grossing up the deferred tax expense using the top corporate tax rate:

$$\text{TEMP} = \frac{\textbf{Deferred Tax Expense}}{0.35}$$

The deferred tax expense in the numerator is the sum of deferred federal and foreign tax expenses. However, if either of these numbers is missing, I calculate the deferred tax expense as the deferred portion of the total income tax expense (Hanlon 2005). Finally, following DeSimone and Stomberg (2012), I scale the temporary book-tax differences for each firm-year sample by the total assets at the beginning of the year.

Independent Variable

The independent variable, ATS$_{it}$, is an indicator variable denoting whether or not a firm receives joint audit and tax services from its auditor. ATS$_{it}$ is set to 1 if firm i procured ATS during year t as indicated by a non-zero tax fee in Audit Analytics and is set to 0 otherwise.

Control Variables

I include several control variables in Eq. (1). Prior research finds that firms with large temporary book-tax differences (TEMP) likely arise from upward earnings management and/or

tax avoidance (e.g. Blaylock et al. 2012). Therefore, I include abnormal accruals (AbAcc) and the cash effective tax rate (Cash3ETR) in the model to control for firms' levels of earnings management and tax avoidance, respectively. As firms' abnormal accruals increase, their inflated book income would likely enlarge the temporary book-tax differences. Thus, a positive relation is predicted between abnormal accruals and temporary book-tax differences. Similarly, if firms engage in tax avoidance and thus pay less tax, which results in a decreased cash effective tax rate, the level of temporary book-tax differences would increase. Hence, a negative relation is expected between the cash effective tax rate and temporary book-tax differences.

The abnormal accruals for each firm-year sample are calculated via the modified Jones model. Following Dechow et al. (1995), I measure the level of abnormal accruals as deviations from the predicted accruals in the corresponding industry-year regression (Eq. 2):

$$TAcc_{it}/A_{it-1} = \alpha_0/A_{it-1} + \beta_1(\Delta R_{it} - \Delta AR_{it})/A_{it-1} + \beta_2(PPE_{it}/A_{it-1}) + \varepsilon_{it2} \qquad (2)$$

where:

$TAcc_{it}/A_{it-1}$ = total accruals for firm i in year t, scaled by total assets at the beginning of year t for firm i; TAcc (total accruals) is measured in Eq.(3) as follows:

$$TAcc_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STD_{it} - DEP_{it} \qquad (3)$$

where:

ΔCA_{it} = change in current assets for firm i from year $t-1$ to t;

ΔCL_{it} = change in current liabilities for firm i from year $t-1$ to t;

$\Delta CASH_{it}$ = change in cash and cash equivalents for firm i from year $t-1$ to t;

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ΔSTD_{it} = change in short term debt included in the current liabilities for firm i from year

        t-1 to t;

DEP_{it} = depreciation expense for firm i in year t.

ΔR_{it} = change in revenue for firm i from year t-1 to t;

ΔAR_{it} = change in accounts receivable from operating activities for firm i from year t-1 to t;

A_{it-1} = total assets at the beginning of year t for firm i;

PPE_{it} / A_{it-1} = gross property, plant, and equipment for firm i in year t, scaled by total assets at the

        beginning of year t for firm i.

For cash effective tax rate (Cash3ETR), I follow Gupta et al. (2014) and compute Cash3ETR as the sum of cash taxes paid over the previous three years divided by the sum of pretax financial accounting income over the same period.

Following Goncharov (2009), I also include lagged temporary book-tax differences ($TEMP_{it-1}$) as a control variable because prior studies suggest that the reported temporary differences between book and taxable income is persistent across two consecutive years (Manzon and Plesko 2002; Dyreng et al. 2008). Therefore, a positive relation is expected between temporary book-tax differences measured in the current and previous year.

Next, I follow Mills and Newberry (2001) and control for firms' leverage (LEV) in Eq. (1). As suggested in Harrington and Smith (2012), firms engaged in aggressive tax avoidance tend to have higher leverage because they are likely to borrow relatively more debt to maintain lower cash effective tax rates. Thus, I expect a positive relation between leverage and temporary book-tax differences.

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Furthermore, I incorporate firms' sales growth (GROWTH) in the model as a control variable given that firms with larger temporary book-tax differences have lower prior sales growth (Racca 2011). Hence, I expect a negative relation between growth and temporary book-tax differences. Finally, I control year and industry-related systematic effects on book-tax differences by including year (YEAR) and industry dummies (IND) in my model.

Testing H2: Impact of Auditor-Provided Tax Services on Mispricing of Book-Tax Differences

I use the following regression model (Eq. 4) to test my second hypothesis which examines whether firms procuring ATS are associated with increased or reduced mispricing of temporary book-tax differences among investors compared with firms that do not receive ATS:

$$AdjRET_{it+1} = \alpha_0 + \beta_1 (TEMP_{it} /A_{it-1}) + \beta_2 (ATS_{it}) + \beta_3 (TEMP_{it} /A_{it-1} * ATS_{it}) + \beta_4 (LEV_{it})$$
$$+ \beta_5 (GROWTH_{it}) + \beta_6 (SIZE_{it}) + \Sigma IND + \Sigma YEAR + \varepsilon_{it4} \qquad (4)$$

where:

$AdjRET_{it+1}$ = adjusted returns for firm i in year $t+1$;

$TEMP_{it} /A_{it-1}$ = temporary book-tax differences for firm i in year t, scaled by total assets at the beginning of year t for firm i;

ATS_{it} = 1 if firm i has auditor-provided tax services during year t and 0 otherwise;

LEV_{it} = ratio of total liability to total assets for firm i in year t;

$GROWTH_{it}$ = percentage change in sales for firm i from year $t-1$ to year t;

$SIZE_{it}$ = natural log of total assets for firm i in year t;

IND = industry dummies based on Fama and French's 48 industries classifications;

$YEAR$ = year dummies from 2000 to 2013.

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Dependent Variable

The dependent variable in my Eq. (4), AdjRET, is the one-year-ahead adjusted buy-and-hold annual return for a given firm-year observation. First, I calculate annul firm-level returns from the firm's adjusted closing prices:

$$\text{Annul Return}_{it} = \frac{\text{Ajusted Price}_{it}}{\text{Ajusted Price}_{it-1}} - 1$$

$$= \frac{(\text{Unadjusted Price}_{it} + \text{Dividiend}_{it})/\text{Ajustment Factor}_{it}}{(\text{Unadjusted Price}_{it-1} + \text{Dividiend}_{it-1})/\text{Ajustment Factor}_{it-1}} - 1$$

Next, I adjust firm-years' annual returns for market returns using the Fama-French portfolios approach (Fama and French 1995):

$$\text{AdjRET}_{it} = \text{Annul Return}_{it} - \text{Market Return}_t$$

More specifically, I first use Ken French's data library[7] to partition firms into quintiles according to size (market capitalization) and book-to-market, which results in 25 benchmark portfolios by interacting the resulting partitioning of firms based on the size and book-to-market quintiles. I then categorize each of my firm-year samples into one of these 25 portfolios and obtain the annual value-weighted benchmark returns for each of the 25 portfolios from Ken French's data library. Finally, the adjusted return (AdjRET) for each of my firm-year samples is calculated as the difference between the annual buy-and-hold returns for each sample and the buy-and-hold returns for the portfolio with the same size and book-to-market ratio.

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[7] Ken French's data library: http://mba.tuck.dartmouth.eduages/faculty/ken.french/data_library.html.

Independent Variable

The independent variable of interest is the interaction between TEMP and ATS, which models the incremental effect of ATS on the association between TEMP and AdjRET. I also include firms' temporary book-tax differences (TEMP) and ATS to model the main effects. A negative association between TEMP and AdjRET would suggest a systematic mispricing of the book-tax differences. If ATS has an effect on investors' mispricing of book-tax differences, I expect that the association between TEMP and AdjRET will change among firms with ATS, resulting in a significant interaction of TEMP*ATS.

Control Variables

Following Lau et al. (2001), I incorporate several variables in Eq. (4) to control for effects of firms' performance and characteristics on future returns. First, I control for firms' leverage (LEV) in the model. As suggested in Fama and French (1992), a firm's required return can increase as a result of increased leverage because leveraged investments are riskier than unleveraged ones. Thus, I expect a positive relation between firms' leverage and returns. I then control for firms' sales growth (GROWTH), since it has been shown in literature that firms with low past sales growth exhibit high returns (Lakonishok et al. 1994; Chan and Lakonishok 2004). I expect a negative relation between growth and returns. I next control for firms' size (SIZE) as Fama and French (1992) suggest that smaller firms have higher stock returns than larger firms because of the increased risks associated with smaller firms. Hence, I expect a negative relation between size and returns. Finally, I control year and industry-specific effects by including dummies for each industry (IND) and year (YEAR) in Eq. (4).

Sample Selection

I obtain firms' tax fee information (paid to the incumbent auditors) from Audit Analytics and other relevant financial and stock price information from Compustat. My firm-year samples cover the period from 2000 to 2013. I select 2000 as the beginning year of my sample because tax fee information first became available in Audit Analytics during that year. 2013 is chosen as the most recent year in my sample to ensure adequate data for the calculation of future stock returns. I use tax fee data to identify firm-years that receive tax services from their auditors. Because firms are only required to disclose tax fees when they purchase auditor-provided tax services, firm-year samples with zero tax fees indicate that no auditor-provided tax services are used. In order to ensure data availability for lagged variables and the computation of the three-year effective tax rate, I further require that relevant data be available during the period between 1998 and 1999. Firm-year observations with any missing data are deleted.

I control industry-specific effects by including industry dummies in my model according to the 48 industry categories used in Fama and French (1997). I further require that each industry-year grouping contain at least 15 observations. Following prior literature, I exclude firm-year samples in the financial services (SIC codes between 6000 and 6500) and regulated industries (SIC codes between 4400 and 5000), which have different regulatory rules for financial and tax reporting. Further, I exclude loss firms (firms with negative earnings) and firms that are foreign-owned. The definitions of all variables used in the models and the empirical analyses are listed in the Appendix.

CHAPTER 5

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 provides the summary statistics for the variables used in the main empirical analyses. Panel A presents the descriptive statistics for variables in the regression model used to test H1 (Eq.1), whereas Panel B provides the descriptive statistics for variables in Eq. (4) used to test H2. In Panel C and Panel D, I provide the descriptive statistics partitioned by whether the firm-year has auditor-provided tax services or not.

The total number of firm-year observations used to test H1, the association between ATS and firms' temporary book-tax differences, is 14,695. In my sample, 67.81% of the firm-year observations received joint audit and tax services from their auditors ($ATS_{it} = 1$) during the sample period (2000 - 2013), which is consistent with prior literature documenting that about two thirds of the sample acquire ATS (Krishnan et al., 2013). The overall mean temporary book-tax differences scaled by total assets (TEMP) is 0.0067 (std. dev. = 0.0470) among all firm-year observations, with firms procuring ATS having significantly lower temporary book-tax differences than those without ATS (0.0047 vs. 0.0076, p = 0.0149). This suggests that ATS might enhance knowledge spillover and limit firms' earnings management (Dechow, 1995). The mean level of abnormal accruals (AbAcc) is -0.0027 (std. dev. = 0.0858) for all firm-year observations. However, for firm years with ATS, the mean abnormal accruals is not significantly different from firm-years without ATS (-0.0027 vs. -0.0015). The mean three-year cash effective tax rate (Cash3ETR) for all sample firms is 25.17% (std. dev. = 0.2394). Again, the mean three-year cash effective tax rate is not significantly different between firm-years with and without ATS (24.96% vs. 25.39%). Finally, the mean leverage (LEV) for all firm-year observations is

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0.4525 (std. dev. = 0.2153), and the mean growth rate (GROWTH) is 0.1227 (std. dev. = 0.1982).

H2 examines whether ATS are systematically associated with investors' mispricing of book-tax differences. The final sample used to test H2 contains 16,668 firm-year observations, with 67.60% of firm-years receiving tax services from their auditors ($ATS_{it} = 1$). The mean adjusted return (AdjRET) among all firm-year samples is 0.0458 (std. dev. = 0.4206). The mean level of temporary book-tax differences scaled by total assets is 0.0056 (std. dev. = 0.0543). Additionally, the mean leverage is 0.4521 (std. dev. = 0.2170), the mean growth rate is 0.1477 (std. dev. = 0.2410), and the mean size (logged total asset) is 6.3598 (std. dev. = 1.9989).

For firm-years with ATS, the adjusted return is significantly lower than firm-years without ATS (0.0381 vs. 0.0674; $p < 0.01$). The level of temporary book-tax differences is comparable between firm-years with and without ATS (0.0051 vs. 0.0065). While growth in sales (GROWTH) is comparable between the two groups, firm-years with ATS overall have higher leverage (LEV) and total assets (SIZE) than those without ATS. These results suggest that firm-years with ATS are different from those without ATS in terms of certain firm characteristics. Hence, it is important to control for such factors in my empirical models while testing for the relationship between ATS and the mispricing of temporary book-tax differences.

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Table 1
Descriptive Statistics

Variable	N	Mean	Median	Std. Dev.	Minimum	Maximum
Panel A: Summary Statistics for variables in Eq.1 (H1):						
$TEMP_{it}/A_{it-1}$	14,695	0.0067	0.0039	0.0470	-0.2010	0.1717
ATS_{it}	14,695	0.6781	1.0000	0.4672	0.0000	1.0000
$AbAcc_{it}$	14,695	-0.0027	-0.0055	0.0858	-0.3066	0.3824
$Cash3ETR_{it}$	14,695	0.2517	0.2645	0.2394	0.0000	1.0000
$TEMP_{it-1}/A_{it-2}$	14,695	0.0054	0.0043	0.0562	-0.2827	0.1861
LEV_{it}	14,695	0.4525	0.4427	0.2153	0.0634	1.1049
$GROWTH_{it}$	14,695	0.1227	0.0890	0.1982	-0.3230	0.9683
Panel B: Summary Statistics for variables in Eq.4 (H2):						
$AdjRET_{it+1}$	16,668	0.0458	-0.0109	0.4206	-0.7541	1.8915
$TEMP_{it}/A_{it-1}$	16,668	0.0056	0.0008	0.0543	-0.2860	0.1861
ATS_{it}	16,668	0.6760	1.0000	0.4680	0.0000	1.0000
LEV_{it}	16,668	0.4521	0.4525	0.2170	0.0431	1.0518
$GROWTH_{it}$	16,668	0.1477	0.1030	0.2410	-0.3611	1.3143
$SIZE_{it}$	16,668	6.3598	6.4453	1.9989	1.4639	10.968

Please see appendix for variable definitions.

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Table 1 (continued)
Descriptive Statistics

| | ATS =1 | | ATS=0 | | Difference in | |
	Mean	Median	Mean	Median	Mean (*t*-stat)	Median (*z*-stat)

Panel C: Comparison between firm-years with and without ATS for variables in Eq.1 (H1)
N=14,695 for full sample; N=9, 964 for ATS = 1; N=4,731 for ATS =0.

$TEMP_{it}$ /A_{it-1}	0.0047	0.0040	0.0076	0.0043	-0.0029* (-2.44)	-0.0003** (-2.66)
$AbAcc_{it}$	-0.0027	-0.0057	-0.0015	-0.0040	-0.0012 (-0.81)	-0.0017 (-1.14)
$Cash3ETR_{it}$	0.2496	0.2589	0.2539	0.2753	-0.0043 (-1.08)	-0.0164** (-4.79)
LEV_{it}	0.4633	0.4552	0.4338	0.4162	0.0295** (6.95)	0.0390** (9.08)
$GROWTH_{it}$	0.1216	0.0894	0.1223	0.0847	-0.0007 (-0.89)	0.0047 (2.22)

Panel D: Comparison between firm-years with and without ATS for variables in Eq.4 (H2)
N=16,668 for full sample; N=11,267 for ATS = 1; N=5,401 for ATS =0.

$AdjRET_{it+1}$	0.0381	-0.0163	0.0674	0.0013	-0.0293** (-4.21)	-0.0176* (-2.35)
$TEMP_{it}$ /A_{it-1}	0.0051	0.0012	0.0065	0.0000	-0.0014 (-1.59)	0.0012 (1.37)
LEV_{it}	0.4612	0.4627	0.4331	0.4260	0.0281** (7.84)	0.0367** (8.25)
$GROWTH_{it}$	0.1483	0.1055	0.1463	0.0973	0.0020 (0.50)	0.0082** (3.17)
$SIZE_{it}$	6.6572	6.7363	5.7393	5.8053	0.9179** (28.41)	0.9310** (28.29)

Please see appendix for variable definitions.
*Significant at the 0.05 level. **Significant at the 0.01 level.
The numbers in parentheses are *t*-statistics in two tailed *t*-tests of differences in means, or *z*-statistics from Wilcoxon signed-rank tests of differences in medians.

Table 2 presents results from the pairwise Pearson correlation analysis between variables in my empirical models. Panel A reports the pairwise correlation coefficients between variables involved in testing H1. The correlation coefficient between temporary book-tax differences (TEMP) and ATS is significantly negative at the $p < 0.05$ level (Table 2, Panel A), suggesting that firms procuring ATS are likely to have smaller temporary book-tax differences. TEMP is also inversely correlated with Cash3ETR ($p < 0.01$), suggesting that firms with higher temporary book-tax differences have lower effective tax rates. In addition, $TEMP_t$ is positively correlated with $TEMP_{t-1}$, consistent with prior literature suggesting that temporary book-tax differences tend to be persistent (Dyreng et al., 2008). However, the correlation between abnormal accruals and temporary book-tax differences is negative ($r = -0.02813$, $p < 0.01$), which is inconsistent with prior literature.

Panel B presents the correlation coefficients between variables involved in testing H2. The correlation between the one-year-ahead adjusted return (AdjRET) and the level of book-tax differences (TEMP) is negative and not significant. Consistent with the univariate analysis in Panel D of Table 1, ATS is negatively correlated with adjusted returns and both LEV and SIZE are positively correlated with ATS.

Table 2
Pearson Correlation Coefficients

Panel A: Variables in Eq.1 (H1):

Variable	TEMP$_{it}$	ATS$_{it}$	AbAcc$_{it}$	Cash3ETR$_{it}$	TEMP$_{it-1}$	LEV$_{it}$	GROWTH$_{it}$
TEMP$_{it}$	**1.00000**						
ATS$_{it}$	**-0.01936***	**1.00000**					
AbAcc$_{it}$	**-0.02813****	-0.00646	**1.00000**				
Cash3ETR$_{it}$	**-0.06024****	-0.00861	0.01255	**1.00000**			
TEMP$_{it-1}$	**0.07939****	-0.00019	**-0.02370****	**-0.02510****	**1.00000**		
LEV$_{it}$	**0.03634****	**0.05510****	**-0.03499****	**-0.02112****	**0.05291****	**1.00000**	
GROWTH$_{it}$	-0.00989	-0.01161	0.00259	0.00317	-0.00020	**0.01776***	**1.00000**

Panel B: Variables in Eq.4 (H2):

Variable	AdjRET$_{it+1}$	TEMP$_{it}$	ATS$_{it}$	LEV$_{it}$	GROWTH$_{it}$	SIZE$_{it}$
AdjRET$_{it+1}$	**1.00000**					
TEMP$_{it}$	-0.00771	**1.00000**				
ATS$_{it}$	**-0.03260****	-0.01232	**1.00000**			
LEV$_{it}$	**0.04063****	**0.04985****	**0.06060****	**1.00000**		
GROWTH$_{it}$	-0.00147	0.00254	0.00386	**-0.004012****	**1.00000**	
SIZE$_{it}$	**-0.007627****	**0.04859****	**0.21492****	**0.38338****	**-0.003108****	**1.00000**

Please see appendix for variable definitions.
Bolded numbers indicate significant correlation coefficients. *Significant at 0.05 level; **Significant at 0.01 level.

Results for H1

Table 3 summarizes the results of the regression analysis on the association between ATS and temporary book-tax differences (TEMP). The coefficient on ATS, β_1, is significantly negative (-0.0011; $p < 0.05$), indicating that firms receiving ATS have significantly smaller temporary book-tax differences compared with firms that do not receive ATS. This result is consistent with the notion that ATS enhance audit quality via knowledge spillover and limit client firms' management of book income and/or taxes.

The association between abnormal accruals (AbAcc) and temporary book-tax differences is positive and marginally significant (0.0044; $p = 0.0576$). This is consistent with the findings in Blaylock et al. (2012) that large temporary book-tax differences are likely to be associated with upward earnings management. Also consistent with prior literature (e.g. Hanlon, 2005), the coefficient on three-year cash effective tax rate (Cash3ETR) is negative at the 0.01 level, which suggests that firms with large book-tax differences also exhibit low effective tax rates. As expected, the prior year's level of temporary book-tax differences (TEMP$_{t-1}$) is positively related (0.0754; $p < 0.01$) to the current year's temporary book-tax difference. In addition, highly leveraged (LEV) firms have large temporary book-tax differences, whereas firms with high sales growth (GROWTH) have small temporary book-tax differences.

Table 3
Regression Results from Eq. (1)

$$\text{TEMP}_{it}/\text{A}_{it-1} = \alpha_0 + \beta_1(\text{ATS}_{it}) + \beta_2(\text{AbAcc}_{it}) + \beta_3(\text{Cash3ETR}_{it}) + \beta_4(\text{TEMP}_{it-1}/\text{A}_{it-2})$$
$$+ \beta_5(\text{LEV}_{it}) + \beta_6(\text{GROWTH}_{it}) + \Sigma\text{ IND} + \Sigma\text{ YEAR} + \varepsilon_{it1}$$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	0.0084	0.0024	12.12	0.0005
ATS_{it}	-0.0011	0.0005	4.07	0.0437
AbAcc_{it}	0.0044	0.0028	2.48	0.0576
Cash3ETR_{it}	-0.0406	0.0010	1624.74	<0.0001
$\text{TEMP}_{it-1}/\text{A}_{it-2}$	0.0754	0.0022	1226.42	<0.0001
LEV_{it}	0.0039	0.0010	15.42	<0.0001
GROWTH_{it}	-0.0013	0.0004	8.66	0.0017

Adj. $R^2 = 7.41\%$
$N = 14,695$

Please see appendix for variable definitions.
Data are for year 2000-2013.
I estimate the model using Robust Regression analysis.
ATS_{it} is two-tailed test; while the other variables are one-tailed tests.

Results for H2

Table 4 reports the results from the regression analysis on the association between ATS

and investors' mispricing of book-tax differences. The significantly negative coefficient on

TEMP (-0.2024; $p < 0.01$) indicates that higher levels of temporary book-tax differences are

associated with lower adjusted returns (AdjRET). This is consistent with prior literature

examining mispricing of book-tax differences (Lev and Nissim, 2004) and implies that investors

do not evaluate information in temporary book-tax differences efficiently, leading to systematic

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pricing errors. Moreover, the coefficient associated with TEMP*ATS is significantly positive

(0.2147; $p < 0.05$), suggesting that the relationship between book-tax differences and future

returns is less negative in the presence of ATS. This result suggests that investors tend to have

decreased mispricing of book-tax differences among firms with ATS. Also as expected, returns

are positively related to leverage (LEV), while returns are negatively to growth and size.

Table 4
Regression Results from Eq. (4)

$$AdjRET_{it+1} = \alpha_0 + \beta_1 (TEMP_{it}/A_{it-1}) + \beta_2 (ATS_{it}) + \beta_3 (TEMP_{it}/A_{it-1} * ATS_{it}) + \beta_4 (LEV_{it})$$
$$+ \beta_5 (GROWTH_{it}) + \beta_6 (SIZE_{it}) + \Sigma\ IND + \Sigma\ YEAR + \varepsilon_{it4}$$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	-0.1209	0.0164	54.58	<0.0001
$TEMP_{it}/A_{it-1}$	-0.2024	0.0825	6.03	0.0071
ATS_{it}	0.0006	0.0080	0.01	0.9236
$TEMP_{it}/A_{it-1} * ATS_{it}$	0.2147	0.1005	4.56	0.0327
LEV_{it}	0.1005	0.0135	55.23	<0.0001
$GROWTH_{it}$	-0.0467	0.0112	17.55	<0.0001
$SIZE_{it}$	-0.0050	0.0015	11.76	0.0003

Adj. $R^2 = 2.00\%$
N = 16,668

Please see appendix for variable definitions.
Data are for year 2000-2013.
I estimate the model using Robust Regression analysis.
ATS_{it} and $TEMP_{it}/A_{it-1} * ATS_{it}$ are two-tailed test; while the other variables are one-tailed tests.

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Supplemental Analyses for H1

I conduct the following supplemental analyses to test the robustness of the main findings
for my H1, which examines the association between ATS and temporary book-tax differences.

Tax Fee Measure

In the following model (Eq. 5), I re-estimate Eq. (1) by replacing the indicator variable
ATS with firms' actual fees paid to the incumbent auditors for tax services. In Eq. (5), firm-years
will have non-zero tax fees if they purchase ATS in a given year. In order to control for the firm
size effect, I scale tax fee for each firm-year sample by the total assets.

$$TEMP_{it} /A_{it-1} = \alpha_0 + \beta_1 (TaxFee_{it} /A_{it-1}) + \beta_2 (AbAcc_{it}) + \beta_3 (Cash3ETR_{it}) + \beta_4 (TEMP_{it-1}/ A_{it-2})$$
$$+ \beta_5 (LEV_{it}) + \beta_6 (GROWTH_{it}) + \Sigma\ IND + \Sigma\ YEAR + \varepsilon_{it5} \qquad (5)$$

where:

$TEMP_{it} /A_{it-1}$ = temporary book-tax differences for firm i in year t, scaled by total assets at the
beginning of year t for firm i;

$TaxFee_{it} /A_{it-1}$ = fees paid to the auditor for tax services for firm i in year t, scaled by total assets
at the beginning of year t for firm i;

$AbAcc_{it}$ = abnormal accruals for firm i in year t;

$Cash3ETR_{it}$ = ratio of the sum of cash taxes paid over the previous 3 years to the sum of pretax
financial accounting income over the previous 3 years for firm i in year t;

$TEMP_{it-1}/ A_{it-2}$ = temporary book-tax differences for firm i in year $t-1$, scaled by total assets at the
beginning of year $t-1$ for firm i;

LEV_{it} = ratio of total liabilities to total assets for firm i in year t;

$GROWTH_{it}$ = percentage change in sales for firm from year $t-1$ to year t;

IND = industry dummies based on Fama and French's 48 industries classifications;

YEAR = year dummies from year 2000 to 2013.

The results from this regression analysis are reported in Panel A of Table 5, and generally agree with the findings reported in Table 3. Specifically, the coefficient on TaxFee is significantly negative (-0.0010, $p < 0.01$), suggesting that firms with ATS have lower levels of temporary book-tax differences. In addition, the negative relation between TaxFee and TEMP further suggests that a higher amount of tax fees paid to the incumbent auditor is associated with lower levels of temporary book-tax differences among firms.

Positive Tax Fee Measure

For this analysis, I further drop firm-year observations with zero tax fees (TaxFee$_{it}$ /A$_{it-1}$ = 0) and re-estimate Eq. (5). The results from this analysis are shown in Table 5, Panel B. Consistent with the results in Table 3 and Panel A of Table 5, the coefficient on TaxFee is again significantly negative (-0.0009, $p < 0.01$), confirming that a higher amount of tax fees paid to the auditor is related to lower temporary book-tax differences.

Table 5
Regression Results from Eq. (5)

$$\text{TEMP}_{it} / A_{it-1} = \alpha_0 + \beta_1 (\text{TaxFee}_{it} / A_{it-1}) + \beta_2 (\text{AbAcc}_{it}) + \beta_3 (\text{Cash3ETR}_{it}) + \beta_4 (\text{TEMP}_{it-1} / A_{it-2})$$
$$+ \beta_5 (\text{LEV}_{it}) + \beta_6 (\text{GROWTH}_{it}) + \Sigma \text{ IND} + \Sigma \text{ YEAR} + \varepsilon_{it5}$$

Panel A: Re-estimation of Eq. (1) by replacing ATS_{it} with $\text{TaxFee}_{it} / A_{it-1}$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	0.0083	0.0022	14.57	<0.0001
$\text{TaxFee}_{it}/ A_{it-1}$	-0.0010	0.0003	11.77	0.0003
AbAcc_{it}	0.0067	0.0023	8.75	0.0016
Cash3ETR_{it}	-0.0442	0.0009	2248.83	<0.0001
$\text{TEMP}_{it-1}/ A_{it-2}$	0.1623	0.0020	6813.48	<0.0001
LEV_{it}	0.0032	0.0009	13.13	0.0002
GROWTH_{it}	-0.0013	0.0004	9.42	0.0010

Adj. R^2 = 9.48%
N = 14,695

Panel B: Re-estimation of Eq. (1) by replacing ATS_{it} with $\text{TaxFee}_{it} / A_{it-1}$ and retain only firm-years with $\text{TaxFee}_{it} / A_{it-1} > 0$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	0.0120	0.0027	20.31	<0.0001
$\text{TaxFee}_{it}/ A_{it-1}$	-0.0009	0.0003	8.89	0.0015
AbAcc_{it}	0.0112	0.0028	15.52	<0.0001
Cash3ETR_{it}	-0.0433	0.0012	1365.59	<0.0001
$\text{TEMP}_{it-1}/ A_{it-2}$	0.1746	0.0023	5616.84	<0.0001
LEV_{it}	0.0039	0.0012	10.29	0.0007
GROWTH_{it}	-0.0023	0.0009	7.35	0.0034

Adj. R^2 = 9.68%
N = 9,964

Please see appendix for variable definitions ($\text{TaxFee}_{it}/ A_{it-1}$ is in thousands of dollars).
Data are for year 2000-2013.
I estimate the model using Robust Regression analysis.
All variables are one-tailed tests.

I conduct the following supplemental analyses to test the robustness of the main findings for my H2, which examines the association between ATS and mispricing of book-tax differences.

Mandatory Tax Fee Disclosure

I re-estimate Eq. (4) after limiting the sample period to post-2003 when the disclosure of tax fees became mandatory. As shown in Table 6, the results show that the coefficient on TEMP is significantly negative (-0.2089, $p < 0.05$) whereas the coefficient for the interaction term TEMP * ATS is significantly positive (0.2297, $p < 0.05$). These results are consistent with the main results attained from the full sample (Table 4), suggesting that the incremental effect of ATS on the negative association between TEMP and adjusted returns is not sensitive to the inclusion of data between year 2000 and 2002.

Table 6
Mandatory Tax Fee Disclosure

$$AdjRET_{it+1} = \alpha_0 + \beta_1 (TEMP_{it} /A_{it-1}) + \beta_2 (ATS_{it}) + \beta_3 (TEMP_{it} /A_{it-1} * ATS_{it}) + \beta_4 (LEV_{it})$$

$$+ \beta_5 (GROWTH_{it}) + \beta_6 (SIZE_{it}) + \Sigma\ IND + \Sigma\ YEAR + \varepsilon_{it4}$$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	-0.1099	0.0168	42.75	<0.0001
$TEMP_{it} /A_{it-1}$	-0.2089	0.0950	4.83	0.0140
ATS_{it}	0.0041	0.0069	0.36	0.5501
$TEMP_{it} /A_{it-1} * ATS_{it}$	0.2297	0.1110	4.28	0.0386
LEV_{it}	0.0930	0.0146	40.65	<0.0001
$GROWTH_{it}$	-0.0510	0.0123	17.29	<0.0001
$SIZE_{it}$	-0.0076	0.0016	23.10	<0.0001

Adj. R^2 = 1.69%
N = 13,385

Please see appendix for variable definitions.
Data are for year 2003-2013.
I estimate the model using Robust Regression analysis.
ATS_{it} and $TEMP_{it} /A_{it-1} * ATS_{it}$ are two-tailed tests; while the other variables are one-tailed tests.

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<u>Effects of the SEC Regulation</u>

In 2005, the SEC set new regulations for non-audit services and especially prohibited certain types of ATS in favor of tax treatments, such as tax marketing, planning, or advice. To control for the potential effects of this regulatory differences, I estimate Eq. (4) separately for the pre-2005 periods (2000 – 2014) and the post-2005 periods (2005 – 2013), and test the difference in the coefficients estimate of the interaction term TEMP * ATS. As shown in Panel A of Table 7, the coefficient on TEMP * ATS is significantly positive (0.3780, p = 0.0314) in the pre-2005 period, while the coefficient on TEMP * ATS interaction is positive and not significant (0.1623, p = 0.1918) in the post-2005 period (Table 7, Panel B). However, the interaction coefficients are not statistically different (difference: 0.2157, p = 0.3586) between the two periods, providing assurance that ATS help reduce the mispricing of book-tax differences and such effect of ATS on mispricing has not changed following the regulatory differences in 2005.

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Table 7
Effects of the SEC Regulation

$$\text{AdjRET}_{it+1} = \alpha_0 + \beta_1 (\text{TEMP}_{it} / A_{it-1}) + \beta_2 (\text{ATS}_{it}) + \beta_3 (\text{TEMP}_{it} / A_{it-1} * \text{ATS}_{it}) + \beta_4 (\text{LEV}_{it})$$
$$+ \beta_5 (\text{GROWTH}_{it}) + \beta_6 (\text{SIZE}_{it}) + \Sigma \text{ IND} + \Sigma \text{ YEAR} + \varepsilon_{it4}$$

Panel A: Re-estimation of Eq. (4) with pre-2005 data

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	-0.0453	0.0251	3.24	0.0718
$\text{TEMP}_{it} / A_{it-1}$	-0.3465	0.1342	6.66	0.0049
ATS_{it}	-0.0164	0.0117	1.98	0.1593
$\text{TEMP}_{it} / A_{it-1} * \text{ATS}_{it}$	0.3780	0.1756	4.63	0.0314
LEV_{it}	0.1733	0.0243	50.96	<0.0001
GROWTH_{it}	-0.0213	0.0194	1.20	0.1363
SIZE_{it}	-0.0086	0.0026	10.72	0.0006

Adj. R^2 = 3.22%
N = 6,340

Panel B: Re-estimation of Eq. (4) with post-2005 data

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	-0.1220	0.0179	46.47	<0.0001
$\text{TEMP}_{it} / A_{it-1}$	-0.1359	0.1057	1.65	0.0992
ATS_{it}	0.0038	0.0074	0.26	0.6123
$\text{TEMP}_{it} / A_{it-1} * \text{ATS}_{it}$	0.1623	0.1243	1.70	0.1918
LEV_{it}	0.0595	0.0162	13.52	0.0001
GROWTH_{it}	-0.0673	0.0136	24.37	<0.0001
SIZE_{it}	-0.0035	0.0018	3.95	0.0235

Adj. R^2 = 1.63%
N = 10,328

Please see appendix for variable definitions.
I estimate the model using Robust Regression analysis.
ATS_{it} and $\text{TEMP}_{it} / A_{it-1} * \text{ATS}_{it}$ are two-tailed test; while the other variables are one-tailed tests.

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<u>Initiation/Continuation/Termination of ATS and Mispricing of Book-Tax Differences</u>

I next test the impact of a firm's initiation, continuation, and termination of ATS on investors' pricing of temporary book-tax differences to corroborate the results in Table 4. Based on the main results from Eq. (4) that ATS mitigate investors' mispricing of book-tax differences, I expect that the mitigating effect will be apparent when firms initiate and continue ATS. On the contrary, when a firm terminates ATS, I expect that investors' mispricing of temporary book-tax differences will increase following the termination.

I modify Eq. (4) by replacing the indicator variable ATS with the following three indicator variables: START, CONT, and END to identify the instances when firms initiate, continue to use, or terminate ATS (Eq. 6). Specifically, START equals 1 during the first year when ATS appear for a given firm, and 0 otherwise. CONT equals 1 during years when a firm continues to acquire ATS after the initiation, and 0 otherwise. END equals 1 for the year immediately after the last year ATS appear for a given firm, and 0 otherwise. To ensure that START picks up the impact of initiating ATS, I require that the firm in question does not have ATS in the year prior to initiation ($START_t = 1$ if $ATS_{t-1} = 0$ and $ATS_t = 1$). Similarly, to ensure that END picks up the impact of terminating ATS, I require that the firm in question have ATS in the year prior to termination but not in the current year ($END_t = 1$ if $ATS_{t-1} = 1$ and $ATS_t = 0$). For CONT, I require that the firm have ATS in both the current year and the prior year ($CONT_t = 1$ if $ATS_{t-1} = 1$ and $ATS_t = 1$). Accordingly, I expect the coefficients on $TEMP_{it}/A_{it-1} * START_{it}$ and $TEMP_{it}/A_{it-1} * CONT_{it}$ to be positive, and the coefficient on $TEMP_{it}/A_{it-1} * END_{it}$ to be negative. I use the following modified regression model to test the impact of a firm's initiation, continuation, and termination of ATS on investors' pricing of temporary book-tax differences:

$$AdjRET_{it+1} = \alpha_0 + \beta_1 (TEMP_{it}/A_{it-1}) + \beta_2 (START_{it}) + \beta_3 (TEMP_{it}/A_{it-1} * START_{it})$$

$$+ \beta_4 (CONT_{it}) + \beta_5 (TEMP_{it}/A_{it-1} * CONT_{it})$$

$$+ \beta_8 (END_{it}) + \beta_9 (TEMP_{it}/A_{it-1} * END_{it})$$

$$+ \beta_{10} (LEV_{it}) + \beta_{11} (GROWTH_{it}) + \beta_{12} (SIZE_{it}) + \Sigma\, IND + \Sigma\, YEAR + \varepsilon_{it6} \qquad (6)$$

where:

$AdjRET_{it+1}$ = adjusted returns for firm i in year $t+1$;

$TEMP_{it}/A_{it-1}$ = temporary book-tax differences for firm i in year t, scaled by total assets at the

beginning of year t for firm i;

$START_{it}$ = 1 if year t is the first year that ATS appears for firm $i,$ and 0 otherwise;

$CONT_{it}$ = 1 if ATS appears for firm i in both year t and year $t-1,$ and 0 otherwise;

END_{it} = 1 if year t is the year immediately after the last ATS for firm $i,$ and 0 otherwise;

LEV_{it} = ratio of total liability to total assets for firm i in year t;

$GROWTH_{it}$ = percentage change in sales for firm i from year $t-1$ to year t;

$SIZE_{it}$ = natural log of total assets for firm i in year t;

IND = industry dummies based on Fama and French's 48 industries classifications;

YEAR = year dummies from 2000 to 2013.

Table 8 shows the results from the regression analysis of Eq. (6). As expected, the

coefficient on TEMP is negative and significant at the 0.05 level, which is consistent with the

mispricing of book-tax differences (Lev and Nissim 2004). However, the coefficients on the

interaction term TEMP*START and TEMP*END are both insignificant, indicating that ATS do

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not have an immediate impact on investors' mispricing of book-tax differences when firms start or cease to use ATS. Finally, the coefficient on TEMP*CONT ($\beta_5 = 0.2653$) is significantly positive at the $p < 0.05$ level, which suggests a significantly decreased mispricing of book-tax differences during years when firms continue to acquire ATS (excluding the first year). It implies that investors are most likely to better price a given firm when the firm acquires ATS continuously, possibly because of the improved earnings quality.

Table 8
Regression Results from Eq. (6)

$$AdjRET_{it+1} = \alpha_0 + \beta_1 (TEMP_{it}/A_{it-1}) + \beta_2 (START_{it}) + \beta_3 (TEMP_{it}/A_{it-1} * START_{it})$$

$$+ \beta_4 (CONT_{it}) + \beta_5 (TEMP_{it}/A_{it-1} * CONT_{it})$$

$$+ \beta_8 (END_{it}) + \beta_9 (TEMP_{it}/A_{it-1} * END_{it})$$

$$+ \beta_{10} (LEV_{it}) + \beta_{11} (GROWTH_{it}) + \beta_{12} (SIZE_{it}) + \Sigma IND + \Sigma YEAR + \varepsilon_{it6}$$

Variable	Parameter Estimate	Standard Error	Chi - Square	P-Value
INTERCEPT	-0.1153	0.0168	46.97	<0.0001
$TEMP_{it}/A_{it-1}$	-0.2306	0.1043	4.89	0.0135
$START_{it}$	0.0112	0.0113	0.98	0.3217
$TEMP_{it}/A_{it-1} * START_{it}$	0.0698	0.1851	0.14	0.3531
$CONT_{it}$	-0.0028	0.0075	0.14	0.7035
$TEMP_{it}/A_{it-1} * CONT_{it}$	0.2653	0.1213	4.78	0.0144
END_{it}	-0.0025	0.0134	0.03	0.8533
$TEMP_{it}/A_{it-1} * END_{it}$	0.0019	0.2176	0.00	0.4965
LEV_{it}	0.0921	0.0143	41.63	<0.0001
$GROWTH_{it}$	-0.0310	0.0122	6.47	0.0055
$SIZE_{it}$	-0.0074	0.0016	22.70	<0.0001

Adj. R^2 = 1.91%
N = 14,501

Please see appendix for variable definitions.
Data are for year 2000-2013.
I estimate the model using Robust Regression analysis.
$START_{it}$, $CONT_{it}$, and END_{it} are two-tailed test; while the other variables are one-tailed tests.

CHAPTER 6

CONCLUSION

This study examines the association between ATS and firms' levels of book-tax differences as well as whether ATS increase or reduce investors' mispricing of book-tax differences. The joint provision of audit and non-audit services has been a controversial issue for decades. SOX of 2002 prohibited most non-audit services, but ATS is one of the few non-audit services that are still allowed in the post-SOX period. In 2005, the SEC further limited the provision of certain types of ATS. Despite the claim by the regulators that non-audit services, including ATS, may post a threat to auditor independence, academic evidence on the effects of ATS on audit quality and auditor independence has been inconclusive.

The present study provides valuable empirical evidence supporting the knowledge spillover hypothesis and suggests that the provision of ATS is associated with lower levels of temporary book-tax differences among firms and decreased mispricing of book-tax differences among investors. Note that the empirical results obtained in this study are not consistent with the concern that ATS leads to impaired auditor independence as a result of the increased economic bonding between auditors and client firms. These empirical results provide new insights to the ongoing debate on whether ATS should be continued. Overall, this study contributes to the line of research studying the impact of book-tax differences on a firm's overall accounting quality and the implication of book-tax differences to investors.

APPENDIX

DEFINITION OF VARIABLES

Variables	Description
TEMP	Temporary book-tax differences = (Deferred federal tax expenses (TXDFED) + Deferred foreign tax expenses (TXDFO))/0.35. If either TXDFED or TXDFO is missing, temporary book-tax differences = Total deferred taxes expenses (TXDI)/0.35
ATS	An indicator variable that is set to 1 if a firm's tax fee (TAX_FEES) is not equal to zero, and 0 otherwise
TAXFEE	Fees paid to the auditor for tax services (TAX_FEES)
AbAcc	Abnormal accruals, measured as deviations from the predicted values from the corresponding industry-year regression $TAcc_{it}/A_{it-1} = \alpha_0/A_{it-1} + \beta_1 (\Delta R_{it} - \Delta AR_{it})/A_{it-1} + \beta_2 (PPE_{it}/A_{it-1}) + \varepsilon_{it}$. A is the total asset (AT), R is revenue (SALE), AR is accounts receivables (RECT), and PPE is gross property, plant, and equipment (PPEGT)
TAcc	Total accruals $= \Delta CA - \Delta CL - \Delta CASH + \Delta STD - DEP$. CA is current asset (ACT), CL is current liabilities (LCT), CASH is cash and cash equivalent (CHE), STD is short term debt included in the current liabilities (DLC), and DEP is depreciation expense (DEP)
Cash3ETR	Three-year cash effective tax rate = the sum of cash tax payments (TXPD) over the past 3 years / the sum of pre-tax income (PI) over the past 3 years
START	An indicator variable that is set to 1 if a specific year is the first year that ATS appeared for a firm, and 0 otherwise
CONT	An indicator variable that is set to 1 if ATS appears for a firm in both a given year and a prior year, and 0 otherwise;
CONT_1	An indicator variable that is set to 1 if a given year has ATS and is immediately after the initiation year for a firm, and 0 otherwise
END	An indicator variable that is set to 1 if a specific year is the year immediately after the last ATS is provided for a firm, and 0 otherwise
LEV	Ratio of total liabilities (LT) to total assets (AT)
GROWTH	Percentage change in sales (SALE)
SIZE	Natural log of total assets (AT)
A	Total assets (AT)

Variables	Description
AdjRET	Adjusted Returns, measured as annual returns adjusted for market returns with the same size (CSHO*PRCC_F) and book-to-market (CEQ/ (CSHO*PRCC_F)). Annual returns$_{it}$ = (Price$_{it}$ + Dividend$_{it}$) / Adjustment$_{it}$) / ((Price$_{it-1}$ + Dividend$_{it-1}$) / Adjustment$_{it-1}$) − 1. Price is the unadjusted closing price for the year (PRCC_F), Dividend is dividend per share (DVPSX_F), and Adjustment is the cumulative adjustment factor (AJEX).
IND	Industry dummies based on Fama and French's 48 industries classifications
YEAR	Year dummies from year 2000 to year 2013
i	Firm i
t	Year t
IND	Industry dummies based on Fama and French's 48 industries classifications

Compustat/Audit Analytics data items listed in parentheses.

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