Auditors and the Predictive Power of the Deferred Tax Valuation Allowance

Zhuoli Axelton
zhuoli.axelton@wsu.edu

Jeffrey Gramlich
jeff.gramlich@wsu.edu

M. Kathleen Harris
mary.k.harris@wsu.edu

All at Washington State University

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ABSTRACT: This paper investigates auditor influence on the association between discretionary changes in the deferred tax asset valuation allowance (VA) and changes in future earnings. Investors can infer expected changes in future earnings from changes in the VA because the VA estimation depends on management's forecast of future taxable earnings. Prior research examines this association using small-sample hand-collected data or large-sample indirect proxies for VA changes. Our large-sample data indicate that discretionary changes in the VA are significant and persistent predictors of future earnings changes for up to five years. Examining auditor influence, we learn that industry auditor expertise and substantial levels of auditor-provided tax services (APTS) improve the predictive power of the VA. These results remain when entropy balancing is applied to alleviate concerns of selection bias. We also document cross-temporal evidence of a stronger association between changes in discretionary VA and changes in future earnings after auditors become industry experts.

Keywords: deferred tax asset valuation allowance, earnings forecasts, auditor characteristics

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I. INTRODUCTION

This paper examines the potential influence of auditors on the accuracy of changes in the deferred tax asset valuation allowance (VA) for forecasting future earnings changes. The VA is a key forward-looking view of the firm's profitability since it reveals management's assessment of the value of tax benefits to be realized from net operating losses (NOLs) and tax credit carryforwards. Benefits from these tax attributes arise only when future pretax earnings are realized.[1] Thus, in contrast with most ex-post-accounting measures, changes in the VA reflect changes in management's ex-ante estimation of the firm's future earnings. In other words, *ceteris paribus*, increases (decreases) in the VA indicate decreases (increases) in management's expectation of future earnings realization. Because external auditors are responsible for evaluating management estimates such as the VA, higher-quality audits could produce VA estimates with greater predictive power.[2] Monitoring management's VA estimates is warranted because expectations of future income likely vary by degrees of managerial optimism (Schrand and Zechman 2012; Hribar and Yang 2016; Capps, Koonce, and Petroni 2016) and by the effects of contracts and other financial incentives (Healy and Wahlen 1999; Cohen, Dey, and Lys 2008) that can cloud management estimates. But no evidence yet exists to determine whether auditor expertise improves the predictive value of the VA.

A priori, it is unclear whether auditors influence the accuracy of the VA estimate because the VA is primarily management's estimation and not the auditor's. To the extent that auditors play a role, it is possible that industry audit expertise could improve the predictive value of the VA estimate. Industry audit expertise could be beneficial if auditors possess greater knowledge of applicable tax rules or a better understanding of the competitive forces within the industry and their impacts on the client's future

[1] ASC 740-30-5 requires a VA "if, based on the weight of available evidence, it is more likely than not (a likelihood of more than 50 percent) that some portion or all of the deferred tax assets will not be realized." AS 2501.04 currently requires auditors to evaluate the reasonableness of all management estimations as they affect the overall financial statements. Further discussion is provided herein.
[2] Throughout the paper, we use the terms "predictive value" and "predictive power" interchangeably.

profitability. Audit firms develop industry expertise through the knowledge attained auditing a large market share of the industry.

Substantial levels of auditor-provided tax services (APTS) could also influence the VA's predictive power. The benefits and harms of APTS continue to be debated by regulators and practitioners. Some argue that providing tax services impairs auditor independence because alignment of interests between tax advisors and their clients reduces the capacity for professional skepticism. Others contend that insights gained from providing tax services facilitate a better understanding of client operations and, by better understanding the business, the auditor can conduct a higher-quality audit (i.e., the "knowledge spillover" hypothesis). Krishnan, Visvanathan, and Yu (2013) examine stock prices and find evidence that investors positively value APTS, which supports the knowledge spillover view, although their study provides no indication as to why APTS increase firm value. Conversely, recent studies suggest that overall investor perception of audit firms' management advisory services is negative when the auditor receives high fees for providing these services (Lisic, Myers, Pawlewicz, and Seidel 2017). Beardsley, Imdieke, and Omer (2017) find that audit quality is lower at both low and high levels of fees for non-audit services (NAS), but they document little or no effect when NAS fees are near the mean. Thus, whether APTS produces higher audit quality remains an open question.

We identify changes in companies' deferred tax VA using a new source of VA data, the Standard & Poor's Capital IQ (S&P CIQ) dataset. The use of this dataset expands the power and generalizability of prior research, which only documents the association between VA changes and future profits using small hand-collected data samples or indirect proxies for the direction, but not the magnitude, of VA changes (Allen 2012; Dhaliwal, Kaplan, Laux, and Weisbrod 2013; Cazier, Rego, Tian, and Wilson 2016; Edwards 2017).[3] For comparison, the sample in this paper is more than 19 times the size of the largest hand-collected sample (Allen 2012) and contains actual VA balances.

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[3] Prior VA studies rely on hand-collected data to calculate the change in the VA (Bauman, Bauman, and Halsey 2001; Jung and Pulliam 2006; Kumar and Visvanathan 2003; Schrand and Wong 2003; Christensen et al. 2008; Allen 2012). Thus, their sample sizes, ranging from n = 122 (Bauman et al. 2001) to n = 793 (Allen 2012), are substantially smaller compared to our sample size, n = 15,373. Typically, hand-collected samples reflect the industry

We also use data from Compustat and Audit Analytics to identify auditor and company characteristics. With the combined data, we develop a model of VA changes relating to tax and historical earnings factors so that the model's residuals estimate management's discretionary VA changes. To assess predictive value, we then associate discretionary VA changes with future earnings changes while controlling for conventional variables known to be linked with future profitability. Once we establish a benchmark association between discretionary VA changes and future earnings, we examine the moderating effects of auditor expertise and the effect of substantial levels of APTS (vis-à-vis no APTS).

Consistent with prior literature, we document a positive association between the change in discretionary VA and future earnings changes for the first time using direct measures of the VA in a large-sample setting. Our measure of discretionary VA associates systematically with future earnings changes for five years, two years longer than the three-year prediction window identified in prior research that employed more limited data. The large sample size produces results that are likely to be more generalizable to a broader population of firms (Kumar and Visvanathan 2003; Allen 2012). Additionally, our use of actual VA levels allows us to empirically assess an association between the magnitude of the change in the discretionary VA and the magnitude of changes in realized future earnings. Prior large-sample research (e.g., Dhaliwal et al. 2013) could only relate inferred signs of changes in the VA (i.e., positive, negative, or no change) with future realized earnings.

We learn that audit expertise matters, impressively. We find that discretionary VA changes are positively, and strongly, associated with future earnings changes when the auditors possess industry expertise. However, we find no such association when the auditor is not an industry expert, and our statistical tests indicate that the predictive value of discretionary VA changes is different between the

(for example, banks) (Schrand and Wong 2003) or specific events or transactions such as IPOs (Allen 2012). Alternatively, other studies of the VA utilize an algorithm applied to financial accounts to identify instances where a material increase or a material decrease of the VA is likely (Dhaliwal et al. 2013; Cazier et al. 2016; Edwards 2017; Drake, Engel, and Martin 2017; Finley et al. 2017). However, the algorithms are limited by potential misclassifications (Edwards 2017) and by an inability to determine the magnitude of VA changes.

groups. We also learn that discretionary VA is more predictive of future earnings when audit clients purchase APTS than when they do not.

The results of this study should be of interest to the Public Company Accounting Oversight Board (PCAOB), which is currently seeking to improve audit tests of management estimates. In June 2017, the PCAOB issued a proposed audit standard to strengthen (and replace) AS 2501.04, which already deems the auditor responsible "…for evaluating the reasonableness of accounting estimates made by management…" (PCAOB 2017). PCAOB inspections staff initiated the proposal with their observations that auditors "at both larger and smaller audit firms" fail to sufficiently test data underlying accounting estimates and fail to evaluate the reasonableness of management assumptions (p. 2).[4] The proposed auditing standard for management estimates reflects the PCAOB's belief that excessive latitude and variability exists in the type and extent of audit procedures applied to management estimates. Our use of the predictive power of the VA allows us to examine how auditor characteristics affect the long-term predictive power of a management estimate that relies heavily on forecasted earnings.

This study is also important because it examines auditor influence through a lens prescribed by the Financial Accounting Standards Board (FASB): predictive value. Under the Conceptual Framework (FASB 2010, BC3.14), relevant information must be capable of helping users make predictions, helping them confirm or improve prior predictions, or both; in other words, to be relevant, information must possess predictive or confirmatory value. The accounting literature employs a variety of methods to assess the quality of financial information, including value relevance, earnings persistence, and abnormal accruals, among others. However, because the VA is useful for forecasting future earnings (i.e., it is *de facto* relevant to decision makers), we can utilize the VA's predictive power as a benchmark for examining the relative effects of auditors on a fundamental component of relevant financial information, predictive value.

[4] The proposal aims to 1) prompt auditors to consider potential management bias, 2) reinforce the need for professional skepticism by auditors, 3) extend key robust audit requirements, currently only in place for fair value measurements, to estimates, 4) integrate risk-assessment standards into estimate evaluations, and 5) provide additional clarity and specificity to the audit requirements (PCAOB 2017).

The results of this paper should be useful for investors to assess auditor effects on accounting disclosure and forward-looking information, aside from income tax disclosures. Management likely possesses the best available information for predicting future earnings. However, for competitive and legal reasons, there is a tendency for management to avoid disclosing long-term earnings. The results of this study give investors a window into management's assessment of the firm's future profitability. Additionally, this study should be of interest to regulators when understanding the effects of auditor expertise and APTS on non-tax-related accounts. Lastly, academic researchers would find these results interesting as they consider another aspect of earnings management as it relates to the tax accounts, in efforts to constrain the VA-related management interventions documented by Frank and Rego (2006) and Christensen, Paik, and Stice (2008).

We provide evidence of the predictive power of the VA using a large sample. Prior large-sample examinations of the predictive power of the VA rely on the signs of U.S. current and deferred tax expense to develop inferred changes in the VA (Dhaliwal et al. 2013; Cazier et al. 2016; Edwards 2017). These studies then create indicator variables based on the change in direction of the VA but do not capture the relative magnitudes of the inferred changes in VA. Alternatively, studies such as Allen (2012) and Jung and Pulliam (2006) rely on hand-collected VA data, and their results only apply to a limited cross-section of clients. By directly measuring VA changes using large-sample data from the S&P CIQ dataset, we capture both the sign and magnitude of changes in the VA, which enables a more granular and generalizable evaluation of the accuracy of the VA estimate.

Our study contributes to research that investigates the effect that audit firms have on the reporting of tax accounts in financial statements. Prior research examining the effects of industry expertise and APTS are limited to income tax expense estimates and earnings management (Gleason and Mills 2011; Choudhary, Koester, and Pawlewicz 2017; Christensen, Olson, and Omer 2015), tax avoidance and related tax risk (McGuire, Omer, and Wang 2012; Chyz, Gal-Or, Naiker, and Sharma 2017), and the probability of a tax-related restatement (Goldman, Harris, and Omer 2017). This study extends this line of research by considering whether auditor expertise, tax expertise, or APTS affect a quality of the VA that the FASB identifies as relevant to decision makers: predictive value.[5] Although prior research indicates a positive association between industry auditor expertise and audit quality when audit quality is measured using abnormal accruals and earnings persistence (e.g., Reichelt and Wang 2010), these measures are largely ex-post, or only predictive in the short-term, and thus are not ideal for evaluating the quality of an ex-ante long-term estimate such as the VA. Thus, given the evidence we report, we suggest that one long-term measure of audit quality is the predictive power of the VA estimate.

We organize the remainder of the paper as follows. In the next section, we provide background information, including a review of pertinent professional guidelines and academic literature, and we develop our hypotheses. In the third section, we present our research design, including model specification and variables of interest. Section IV presents our empirical results, section V provides additional analyses, and section VI concludes.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

Professional Standards and Regulatory Oversight

Guidance from professional auditing standards, the PCAOB, and the Securities and Exchange Commission (SEC) reinforce the critical role that auditors fill in evaluating these estimates. Under AS 2501.04, auditors evaluate the reasonableness of management's accounting estimates in the context of overall financial statements. The rule encourages "professional skepticism" and requires the auditor to consider both subjective and objective factors, as well as the potential for bias in the subjective factors. Importantly, however, no specific tests are required to validate the data used to develop accounting estimates.

In June 2017, after a three-year comment period concerning its initial discussion draft (PCAOB 2014), the PCAOB signaled dissatisfaction with the strength and specificity of AS 2501.04 by issuing a proposed replacement (PCAOB 2017). The guideline proposes a new standard for audit evaluations of

[5] In 2010, the FASB and the IASB jointly declared that financial information is relevant to investors, creditors, and other decision makers if it helps users predict future outcomes (i.e., it has predictive value) or confirms or changes their previous evaluations (i.e., it has confirmatory value). See FASB (2010) and IASB (2010).

management estimates, specifically including the VA.[6] The estimate-focused proposal would 1) require additional audit procedures, 2) emphasize auditor attention to potential management bias and encourage professional skepticism, 3) extend the current procedures used in the evaluation of fair values to all significant accounting estimates, and 4) integrate risk-assessment standards in the evaluation of accounting estimates.

The SEC routinely issues publicly available comment letters to registrants expressing concerns about the methods employed to calculate VA estimates (Finley, Ribal, and Weisbrod 2017). Many of these letters focus on situations where companies reduce the VA because, in order to utilize related NOLs or credits, they must cross the recognition threshold from unlikely to likely to be realized. This decision is critical because it both increases current generally accepted accounting principles (GAAP) income, and perhaps more importantly, it indicates management's optimism about the likelihood of future profitability. Finley et al. (2017) find that companies with VA releases (i.e., management decisions to reduce the VA) are three times as likely as companies without VA releases to receive an SEC tax-related comment letter. PCAOB reviews of public accounting firm audits also suggest a higher percentage of comments related to audits of tax accounts (Acito, Hogan, and Mergenthaler 2017), and tax accounts caused the only firm-wide deficiency reported in a PCAOB Part II inspection report for large accounting firms (Drake, Goldman, and Lusch 2016). Thus, through comment letters and public admonishments, the SEC and PCAOB's monitoring of VA estimates imposes limits and costs on auditors and their clients.

The Mechanics of the VA and Its Relation to Future Earnings

There are four main reasons the VA varies. First, VA changes occur because of confirmed past performance or expected future performance, changing the portion of the deferred tax asset the company expects to realize. NOLs and tax credit carryforwards are primary sources of deferred tax assets (Miller and Skinner 1998). The value of these tax characteristics depends on estimates of future profits, so

[6] Specific to the VA estimate, PCAOB Staff Audit Practice Alert No. 3 (PCAOB 2008) discusses the need for skeptical VA auditor evaluations during the 2008 financial crisis. The Alert quotes SFAS No. 109, reiterating that evidence supporting forecasts of future income, which drive the VA, should be evaluated such that "the weight of negative and positive evidence should be commensurate with the extent to which it can be objectively verified."

management, under the watchful eye of external auditors, must forecast future income to appraise the value of these tax assets and establish the VA. The second reason for changes in the VA relates to the expiration of NOLs and tax credit carryforwards. The third cause for VA changes results from mergers and acquisitions, which can affect both the magnitude of deferred tax assets and the likelihood and extent of probable future income to offset tax loss and credit carryforwards. The fourth reason for changes in the VA is possible clouding of management judgment caused by innate overoptimisim about future profitability, by desire to obtain payoffs related to explicit or implicit contracts, or by management uncertainty about future events.

The FASB intended the VA as a tool for indicating management's assessment of the likelihood of realizing profit-dependent tax benefits from loss and credit carryforwards. Consistent with the FASB's intention, prior research documents a systematic association between changes in the VA and future profitability. However, the generalizability of this research is limited because these studies examine small hand-collected samples that pertain to narrow cross-sections of publicly held companies. For example, Allen (2012) examines a sample of 793 venture capital-backed initial public offerings (IPOs) and finds that the magnitude of a VA is negatively associated with total future return on assets (ROA) for the succeeding three years across multiple levels of venture capital ownership. Similarly, Jung and Pulliam (2006) examine a sample of 719 news releases that mention the VA and find that VA changes are negatively related to earnings from continuing operations in each of the two succeeding years.

Dhaliwal et al. (2013) focus on Compustat loss firms to address the lack of large-sample VA data. They rely on the signs of U.S. federal current and deferred tax expense to form a three-level ordinal variable. In the first group, loss firms with zero or positive deferred tax expense are expected to have materially increased the VA, and the authors predict that these firms' losses will persist into the future. In the second group, loss firms with negative deferred tax expense but zero or negative current tax expense are assumed to avoid increasing the VA, and this group is expected to have less persistent losses than the first group. The third group of loss firms, with negative deferred tax expense and positive current tax expense (a proxy for positive taxable income), is also assumed to avoid a material VA increase; this group has the brightest outlook for future profitability. Dhaliwal et al. (2013) report empirical results consistent with the expectations that firms in the second and third group have less persistent losses than the first group, and that firms in the third group have less persistent losses than the second group. In subsequent research, Cazier et al. (2016) employ the Dhaliwal et al. (2013) measure to evaluate voluntary management earnings forecasts for years immediately after loss years. Edwards (2017) modifies the Dhaliwal et al. (2013) algorithm to provide support for an association between increases (decreases) in the VA and decreases (increases) in credit ratings in the following year.

Despite conceptual and prior empirical support of the view of a negative association between VA increases (decreases) and future earnings, there are two reasons that this relation might not exist: earnings management incentives and management over-optimism. First, income tax accounts such as the VA are subject to management incentives that could motivate the manipulation of earnings for personal objectives other than for the issuance of unbiased financial results (Schipper 1989). Because income tax expense is one of the last income statement accounts finalized in the reporting process, it could be more susceptible to management bias than other accounts (Dhaliwal, Gleason, and Mills 2004; Cook, Huston, and Omer 2008; Christensen et al. 2015). Examples of VA-related earnings management are examined in Burgstahler, Elliott, and Hanlon (2002), who find that managers of companies with small profits reach profitability through reductions in the VA. Schrand and Wong (2003) document evidence that banks use the VA to smooth earnings toward a three-year average of earnings, as well as toward consensus analyst earnings forecasts. Similarly, Frank and Rego (2006) examine manufacturing companies and find consistent evidence of earnings management through the VA to smooth earnings, avoid reporting losses, and meet analyst earnings forecasts.

Management over-optimism could also introduce noise into the VA estimate. While there is no known evidence of an association between management optimism and VA estimates in particular, an association between management optimism and a positive bias is known to exist in other areas of financial reporting (Schrand and Zechman 2012; Hribar and Yang 2016; Capps et al. 2016).

In summary, if managers use the VA as intended and if the results of small-sample and inferred-proxy studies apply to a broad cross-section of firms, a negative association between changes in the VA and future profits should exist in a large-sample setting. On the other hand, if earnings management incentives or management optimism sufficiently obfuscate VA estimates, a positive association between VA changes and future earnings might not exist. Thus, we offer the following hypothesis stated in null form:

$H0_1$: There is no association between changes in the VA and future earnings.

Auditors and the VA

Our primary objective is to extend prior accounting literature on the influence auditors have on the predictive value of accounting information. Auditors provide assurance of the reasonableness of management estimates included in financial statements (AU Section 342.04). Thus, audit quality could influence the change in the VA to accurately reflect management's predictions of future earnings. Prior literature documents associations between auditor characteristics and reductions in earnings management (e.g., Becker, DeFond, Jiambalvo, and Subramanyam 1998; Francis, Maydew, and Sparks 1999; Zang 2012). In this vein, we consider two different auditor characteristics that could influence the quality of VA estimates subject to audit: auditor expertise and APTS.

Prior studies report positive associations between industry audit expertise and overall audit quality (Ferguson, Francis, and Stokes 2003; Reichelt and Wang 2010; Gul, Fung, and Jaggi 2009; Carcello and Nagy 2004). The prior literature also supports an association between audit quality and improved financial reporting quality, which in turn suggests reduced earnings management and stronger predictions from accounting information (Becker et al. 1998). Clarkson (2000) shows a negative and significant association between audit quality and management forecast accuracy when the auditor has more responsibility over earnings forecasts. Finally, Behn, Choi, and Kang (2008) suggest that audit quality improves the accuracy of consensus analyst earnings forecasts.

Dunn and Mayhew (2004) provide evidence that industry-specialist audit firms are positively associated with clients' accounting disclosure scores. Their study, along with other prior research (e.g., Palmrose 1986; Hogan and Jeter 1999; Mayhew and Wilkins 2003), measures industry auditor expertise using market share. Greater market share in an industry allows more exposure to industry-specific issues and investment in industry-specific training (McGuire et al. 2012; Goldman et al. 2017). Industry expertise can provide additional knowledge obtained through specialization, which would increase the association between VA changes and future earnings. However, tax accounts tend to be task specific and therefore may not benefit to the same extent from industry expertise (Goldman et al. 2017), which could manifest with a weaker association between VA changes and future earnings changes. As a result, we offer the following hypothesis, stated in null form:

$H0_2$: Industry auditor expertise does not affect the association between VA changes and future earnings changes.

We next extend the intersection of the tax and audit literatures by examining whether substantial levels of APTS affect the association between VA changes and future earnings changes. Prior research finds mixed evidence on the effect of APTS on audit quality (e.g., Lennox 1999). The prior studies find support both for improvements in audit quality from knowledge spillover (e.g., Gleason and Mills 2011; Paterson and Valencia 2011; Beardsley et al. 2017), as well as diminution in audit quality resulting from potential impaired auditor independence (e.g., Srindhi and Gul 2007). The auditor can have additional involvement in client operations and various tax functions through APTS, as well as tax-planning consultations and tax-preparation services. This level of involvement differs from an audit of the financial statements and could influence the association between VA changes and future earnings.

Gleason and Mills (2011) find a positive association between auditors providing tax services to clients and estimates of the tax reserves, which supports knowledge spillover. Alternatively, Choudhary et al. (2017) find evidence that APTS reduces auditors' professional skepticism by documenting that estimation error in the tax expense account is nearly 10 percent greater among companies that purchased APTS. Chyz et al. (2017) report evidence that effective tax rates are lower for companies using APTS in addition to tax compliance services, suggesting that there are planning-related tax benefits to using APTS.

In summary, the prior literature provides support for the view that APTS provide benefits through knowledge spillover, which could improve the association between VA changes and future earnings. Alternatively, APTS could impair auditor independence by reducing professional skepticism, which would suggest no effect of APTS on the association between VA changes and future earnings. Thus, we offer the following hypothesis:

$H0_3$: The presence of a substantial level of APTS, versus no reported APTS, does not affect the association between VA changes and future earnings.

III. RESEARCH DESIGN

Sample Selection

A sample of firm-year observations from the intersection of S&P CIQ, Compustat, and Audit Analytics databases for 2004-2015 is used to investigate the influence of auditor characteristics on the association between discretionary change in the VA and future earnings. Consistent with Christensen et al. (2015), our sample period is after 2003 to maintain consistent reporting requirements and auditing regulations following Sarbanes-Oxley. We also exclude foreign incorporated companies because foreign companies face different tax and financial reporting rules, as well as exclude companies with going-concern issues to eliminate the potential of influencing the future predictions of earnings. We further exclude financial institutions (Standard Industrial Classification [SIC] codes 6000–6999) and public utilities (SIC codes 4900–4999) because regulated companies have different reporting requirements (Lev and Nissim 2004; Hanlon and Heitzman 2010; Edwards 2017). We also require all observations to have positive total assets and audit fees in Audit Analytics. Table 1 summarizes the sample selection process and the effects of these requirements on sample size.

<<<Insert Table 1 about here>>>

The final sample consists of 15,373 firm-year observations and 2,414 unique companies. All continuous variables are winsorized at the 1st and 99th percentiles of the distributions to minimize the influence of extreme observations.

Description of Variables

ASC 740-10-30-5 requires companies to record an appropriate amount of the VA (a contra-asset account) to deferred tax assets if "it is more likely than not (a likelihood of more than 50 percent) that some portion or all of the deferred tax assets will not be realized." At each balance sheet date, the firm determines the VA by applying this judgment rule. Therefore, when a firm does not expect to realize part (or all) of the deferred tax asset for which a VA did not previously exist, an increase in the VA is required, and this adjustment increases current tax expense. Alternatively, when a firm expects to realize the deferred tax asset for a previously established VA, a firm reduces the VA and tax expense.

We obtain the balance of the VA by firm-year from S&P Capital CIQ, allowing this study to utilize a relatively large sample of year-to-year changes in the VA. Consistent with Frank and Rego (2006), we calculate the net change in the VA by subtracting the prior-year VA balance from the current-year VA, and then scaling this difference by average total assets.[7]

To address the (non-management estimate) factors in VA changes, we use ordinary least squares (OLS) regression to estimate the portion of the VA change that is attributable to management estimates of future taxable income. Specifically, our first-stage model uses the Frank and Rego (2006) model to estimate management's discretionary changes in the VA as the residuals of a model of VA changes explained by factors likely unrelated to management estimates (i.e., carryforward characteristics and reversals of deferred tax assets and liabilities). The model includes controls for the future reversal of tax liabilities (*ΔDTL)*, the total change in deferred tax assets related to NOLs (*ΔNOLDTA*), changes in NOLs related to other sources (*ΔODTA*), and the change in pretax income in the prior year and the second preceding year (*ΔPI* and *ΔPII*, respectively). We estimate first-stage regression models separately for each

[7] Frank and Rego (2006) scale the change in the VA by common shares; however, we scale the change in VA total assets. A more thorough approach, but one that is cost-prohibitive in a large-sample setting, would be to isolate management's estimation change within the total VA change. In other words, a detailed hand-collection would be to use the effective tax rate reconciliation to exclude VA changes in attributable loss or credit carryforward expirations and settlements with authorities (i.e., components that affect the VA change other than management estimation). Similar to studies that rely on the Dhaliwal et al. (2013) categorical approach, our use of abbreviated VA data has limitations; while we do consider some degree of magnitude, the VA data we use is not sufficiently granular to directly isolate the portion of the VA change that results from management estimations.

one-digit SIC code to allow the effect of nondiscretionary changes in the VA to vary systematically by industry; the residuals become our proxy for the discretionary change in the VA, *ΔDISCVA*:[8]

$$\Delta VA = \beta_0 + \beta_1 \Delta NOLDTA + \beta_2 \Delta ODTA + \beta_3 \Delta DTL + \beta_4 \Delta PI + \beta_5 \Delta PI1 + YEAR\_FE + \varepsilon \qquad (1)$$

Industry Expertise and APTS

Prior research finds evidence that audit firms' industry expertise improves financial reporting quality (Reichelt and Wang 2010). Christensen et al. (2015) document that auditor expertise and knowledge spillover are effective in mitigating earnings management through the tax accounts. As one portion of financially reported tax accounts, the VA is subject to examination by the external auditor, and the auditor's attestation includes management's assessment of changes in the VA. Thus, to the extent that higher-quality audits constrain the use of the VA for earnings management (Bauman et al. 2001; Schrand and Wong 2003; Christensen et al. 2008), we expect the association between changes in the VA and future earnings to be stronger. Following McGuire et al. (2012), we measure an audit firm's industry expertise based on the firm's annual market share in a given industry and city. This measure assumes that an audit firm's industry expertise at the local office level plays a significant role in audit quality and depends on its dominance within an industry in the local market. We define industry based on two-digit SIC codes and define a city as a Metropolitan Statistical Area (MSA) (Francis et al. 1999; Reichelt and Wang 2010).[9] We classify audit firms as audit experts if their local industry market share exceeds 30 percent (*AUDEXP* = 1).

Prior research has examined the association between APTS and estimates of the tax reserve (Gleason and Mills 2011). We measure APTS with an indicator variable (*APTS*) equal to one when the client reports substantial APTS equal to or above the median, or zero to indicate firm-years where either no APTS fees are reported or the level of APTS is relatively small.

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[8] Consistent with Frank and Rego (2006), we drop observations with one-digit SIC codes 0 and 9. For clear exposition, we exclude firm and year subscripts.
[9] In untabulated tests, we estimated *ΔDISCVA* using a two-digit SIC code, and our inferences did not change.

Estimating the Power of a Discretionary VA Change as a Predictor of Future Earnings Growth

We estimate future earnings changes on a pretax basis to exclude the bias of tax expense on future earnings. Following Jackson (2015), we measure the change of pretax income using five variations by subtracting current-year pretax return on average assets from average pretax ROA calculated over one, two, three, four, and five years, referred to as *ΔPTI1, ΔPTI2, ΔPTI3, ΔPTI4,* and *ΔPTI5,* respectively. The following OLS regression model, which excludes year and firm subscripts for brevity, tests $H0_1$ by examining whether discretionary changes in the VA predict future earnings growth:

$$\Delta PTI1 \ldots \Delta PTI5 = \beta_0 + \beta_1 \Delta DISCVA + \beta_2 RD + \beta_3 CAP + \beta_4 EP + \beta_5 BTM + \beta_6 \Delta ROA + \beta_7 \Delta ROA3 + \beta_8 \Delta ROA5 + \beta_9 DIV + \beta_{10} OCF + \beta_{11} ACC + \beta_{12} ACQ + \beta_{13} SIZE + INDUSTRY\_FE + YEAR\_FE + \varepsilon \quad (2)$$

The variable of interest, *ΔDISCVA*, representing discretionary changes in the VA, is the residual from applying model (1) to explain VA changes; a significant coefficient on *ΔDISCVA* would support rejecting $H0_1$. The control variables employed in model (2) are consistent with prior studies that predict future earnings changes using tax accounts (Jackson 2015; Lev and Nissim 2004). For instance, we include the average change in ROA over one, three, and five years as *t* minus *t*-1, *t* minus *t*-3, and *t* minus *t*-5, respectively, denoted *ΔROA, ΔROA3,* and *ΔROA5*. Other variables in the model related to future earnings growth are dividends scaled by assets (*DIV*), the ratio of research and development (R&D) expenses to sales (*RD*), the ratio of capital expenditures to sales (*CAP*), the current earnings-to-price ratio (*EP*), the book-to-market ratio (*BTM*), operating cash flow scaled by assets (*OCF*), and operating accrual measured as operating income minus operating cash flow (*ACC*), scaled by beginning-of-year total assets. Historical changes in ROA control for trends in earnings while the earnings-to-price and book-to-market ratios control for the market's expectation of future earnings growth. Accruals and operating cash flow, as well as the R&D and capital expenditures ratios, represent existing operating conditions and the magnitude of capital investments. We also control for whether the client has an acquisition during the current year (*ACQ*) and client size (*SIZE*). Lastly, we include year and industry fixed effects to control for variability in future profitability because of time- and industry-specific dynamics.

Once model (2) is estimated, we rely on its results as a benchmark for evaluating the effects of auditor characteristics. We separately estimate model (2) for companies audited by industry experts (*AUDEXP* = 1) and for companies not audited by industry experts (*AUDEXP* = 0). We compare the coefficients on *ΔDISCVA* to determine if they are significantly different between the two groups.[10] A significant difference would support rejecting $H0_2$. Similarly, to examine the possible effect of APTS on the predictive value of the discretionary VA, we split the sample based on whether companies purchase substantial tax services from their audit firm (*APTS* = 1) or report no fees for APTS (*APTS* = 0). If the coefficients on *ΔDISCVA* are significantly different between the *APTS* = 1 group and the *APTS = 0* group, this would support rejecting $H0_3$.

IV. RESULTS

Descriptive Statistics

Table 2 provides descriptive statistics for the full sample. In Panel A, the mean (median) change in the VA, deflated by total assets, is 0.014 (0.000), with the lower and upper quartiles at -0.001 and 0.010, respectively. Thus, the mean VA change is greater than the 75th percentile of the VA change variable, meaning the distribution is skewed. A few firm-years indicate large positive changes in VA while most firm-years indicate no, or small, year-to-year change in VA.

The bottom two rows compare the ratio of the VA to total deferred tax assets (DTA) for companies with negative pretax income (*CurrLoss* = 1) and companies without negative pretax income (*CurrLoss* = 0). Among loss companies, the mean (median) VA/DTA ratio is 0.76 (0.96), and among profitable companies the mean (median) VA/DTA is 0.23 (0.09). This result suggests that the VA is a greater proportion of the total deferred tax assets for companies experiencing current year losses.

Seventy-four percent of the observations purchase some form of APTS. But *TAX_FEES,* the Audit Analytics variable for the cost of APTS, are often so small that they are likely to be

[10] SUEST is a Stata command to invoke a generalized Hausman test for cross estimators. Weesie (2000) provides further discussion, and we follow Christensen et al. (2015) in applying the technique.

inconsequential.[11] As a result, for *APTS* to equal 1, we require that the total fees paid for APTS are equal or exceed the median. Fifty-seven percent of firm-years indicate auditors with industry expertise.

<<<Insert Table 2 here>>>

Table 2, Panel B presents Pearson and Spearman correlation matrices for our variables of interest. As expected, there are negative associations between 1) *ΔVA* and *ΔDTL*, 2) *ΔVA* and *ΔPI,* and 3) *ΔVA* and *ΔPI1*. Consistent with prior studies, we note that *AUDEXP* and *APTS* are positively correlated (p<0.01). Table 2, Panel C provides descriptive statistics conditional on the audit firm's industry expertise and the univariate test results of the mean and median comparison of all the variables. Interestingly, the change in the VA for audit firms without expertise (mean = 0.018) is about twice the level of the change for audit firms with expertise (mean = 0.010), p<0.01. It also appears that audit firms with industry expertise tend to audit companies with greater operating cash flow (*OCF*) than non-expert audit firms. Mean *OCF* is significantly greater for companies using industry audit experts (p<0.01). This latter observation is consistent with companies hiring more expensive expert audit firms because their operations produce excess cash flow and they can afford higher audit fees, because they seek to minimize the risk of a reputation- and cash flow-impairing accounting failure, or both (Cao, Myers, and Omer 2012).

Table 2, Panel D provides the descriptive statistics conditional on whether the firm also hires an auditor for substantial tax services (i.e., *APTS* = 1) and the univariate test results of the mean and median comparison of all the variables. Companies hiring an audit firm for substantial tax services increase the VA at lower rates than companies that report no APTS (p<0.01), increase NOLs less (p<0.01), and indicate higher earnings-to-price ratios (p<0.01); all three of these differences suggest that companies not purchasing APTS are riskier endeavors compared to companies that do purchase APTS. In addition, companies that purchase APTS have much greater cash from operations, *OCF*, than companies that do not purchase APTS (p<.01).

[11] Comments that APTS fees are often so small as to be inconsequential were aired at the 2017 University of Illinois Symposium on Tax Research in the discussion of Chyz, Gal-Or, Naiker and Sharma (2017). Skewness pervades, however. Both the mean and 75th percentile of tax fees are 0.03 percent of total assets while median tax fees are only 0.004 percent of total assets.

Results of Model (1) to Explain VA Changes

Table 3 presents results from the first-stage regression of change in the VA on all historical factors associated with the change of the VA and is presented for each industry based on a 1-digit SIC code. The model is designed to remove the effects of non-discretionary variables that are likely to affect the change in the VA so that the residuals represent management's estimate of future taxable income embedded in the VA change. All signs on the coefficients are consistent with the expectations of the variable.

<<<Insert Table 3 here>>>

Evaluation of the Association Between Discretionary VA and Future Earnings

Table 4 tests $H0_1$, which examines the association between discretionary VA changes and future earnings changes. Columns (1) through (5) present the results of examining the association between discretionary VA changes and five different measures of future earnings changes. The dependent measures are future pretax ROA measured as averages across the next one to five years, minus current pretax ROA (i.e., *ΔPTI1* to *ΔPTI5*). The test variable is the change in discretionary VA (*ΔDISCVA*) measured as residuals from model (1). As mentioned earlier, model (2) controls for other factors likely to affect the growth in future earnings, including R&D expenditures, capital expenditures, the earnings-to-price ratio, the book-to-market ratio, recent trends in ROA changes, recent dividends, operating cash flow, and operating accruals. After controlling for these factors, negative coefficients on *ΔDISCVA* remain and are significant for *ΔPTI* ($p<0.05$), thus rejecting $H0_1$. These results suggest that the change in discretionary VA is negatively associated with future earnings changes in *t+1* through *t+5*, consistent with prior studies' findings (for smaller samples) of a negative association between discretionary changes in the VA and future earnings changes. Perhaps most importantly, the evidence we report indicates that the prediction power extends for five years. We also note that the significance and direction of the coefficients for all control variables are consistent with results reported by Jackson (2015).

<<<Insert Table 4 here>>>

The Effects of Audit Expertise on the Association Between Discretionary VA Changes and Future Earnings

To test $H0_2$, Table 5 estimates model (2) while restricting the sample to companies that have an auditor that is an industry expert (*AUDEXP* = 1*)* in Columns (1) through (5) and also for companies that have an auditor that does not possess industry expertise (*AUDEXP* = 0*)* in Columns (6) through (10). Notably, the *ΔDISCVA–ΔPTI* relation is significant across all five *ΔPTI* measures *ΔPTI1* to *ΔPTI5* for companies with audit experts ($p<0.01$). Interestingly, the magnitude of the negative coefficients, as well as the size of the *t*-statistics, increase monotonically as forecast years extend further into the future. On the other hand, the coefficients for *ΔDISCVA* are marginally significant ($p<0.10$) for *ΔPTI1* and insignificant for *ΔPTI2, ΔPTI3*, *ΔPTI4*, and *ΔPTI5* for companies without an industry audit expert. These results indicate that most, if not all, of the association between *ΔDISCVA* and future earnings identified in Table 5 occurs in companies with audit firms that possess industry expertise. When we run simultaneous equations to compare the coefficients, the results indicate a stronger association between *ΔDISCVA* and *ΔPTI* among companies audited by experts as opposed to companies audited by non-experts ($p<.05$ for *ΔPTI1* and $p<.01$ for *ΔPTI2* through *ΔPTI5*). Thus, the evidence supports rejecting $H0_2$.

<<<Insert Table 5 here>>>

In additional untabulated tests following McGuire et al. 2012, we consider whether joint expertise (i.e., both industry audit and tax expertise) provides incremental power beyond industry audit expertise alone. We find no evidence that industry tax expertise, beyond industry audit expertise significantly improves the predictive power of the VA, which is unsurprising since 78.0 percent of industry audit experts in our sample also possess industry tax expertise. To further examine which type of industry expertise, audit or tax, drives our results pertaining to *AUDEXP*, we define two subsamples. The first subsample only includes firm-years where the audit office possesses industry audit expertise *but not* industry tax expertise. The second subsample includes only firm-years where the audit office possesses industry tax expertise using the McGuire et al. 2012 measure *but not* industry audit expertise. We then estimate model (2) for each of these subsamples for each of the change prediction variables, *ΔPTI1* to *ΔPTI5*, and report the results in Table 6.

<<<Insert Table 6 here>>>

Columns (1) through (5), where the auditor possesses industry audit expertise but not industry tax expertise, show results consistent with the main findings in Table 5; the coefficients on *ΔDISCVA* remain negative and significant for *ΔPTI* (p<0.05), thus rejecting $H0_1$. Columns (6) through (10), where the auditor possess industry tax expertise but not industry audit expertise, reveal insignificant coefficients on *ΔDISCVA* (p<.05 for *ΔPTI1-3* and p<.01 for *ΔPTI4-5*). In other words, industry audit expertise significantly improves the predictive value of valuation allowance changes but there is no evidence that industry tax expertise affects the predictive value.

The Effect of APTS on the Association Between Discretionary VA Changes and Future Earnings

APTS may be another auditor characteristic that influences the association between *ΔDISCVA* and future earnings, and, thus, Table 7 tests whether APTS affects the results in Table 4. Table 7 compares companies that purchase APTS with companies that do not. Similar to Table 5, the focus of the comparisons is the coefficients of *ΔDISCVA* across *ΔPTI1* to *ΔPTI5.*

<<<Insert Table 7 here>>>

Table 7 provides results related to $H0_3$. First, companies with APTS show a strong association between *ΔDISCVA* and all five measures *ΔPTI1* to *ΔPTI5* (p<0.01). However, the insignificant coefficients on *ΔDISCVA* in Columns (6) through (10) fail to support the view that *ΔDISCVA* is useful for predicting earnings changes when the auditor does not provide substantial tax services. Using simultaneous equations to compare the coefficients, the results indicate that companies with APTS have a stronger association between *ΔDISCVA* and future earnings one year forward (*ΔPTI1* [p<.10], *ΔPTI2* [p<.10], *ΔPTI3* [p<.05], *ΔPTI4* [p<.05], and *ΔPTI5* [p<.05]) when compared to companies that do not purchase APTS. In summary, Table 7 provides evidence that APTS increase the predictive power of the change in discretionary VA and future performance.

V. ADDITIONAL ANALYSES

Potential Endogeneity of Auditor Selection

It is possible that higher-quality auditors audit higher-quality companies, thus creating the potential for endogeneity. To address this concern, we use entropy balancing, which controls for companies with auditors that possess different expertise or provide different services (i.e., APTS). Thus, we use two different entropy-balanced samples: one with the treatment variable *AUDEXP* and another sample balancing on *APTS*. When implementing entropy balancing, the mean, variance, and skewness are balanced to eliminate the potential that distribution-related characteristics that differ between the treatment and control groups drive the results (Hainmueller 2012; Hainmueller and Xu 2013). This process assigns greater weight to the underrepresented group and less weight to the overrepresented group.

Table 8 (Panels A and B) provides the descriptive statistics of the balanced sample where the treatment variable is *AUDEXP* and *APTS*, respectively. Convergence was reached for all moments (mean, variance, and skewness), with no modifications to the weight refinements.

<<<Insert Table 8 & 9 here>>>

Table 9 (Panels A and B) provides the results of using the entropy-balanced samples and estimating model (2) while interacting the respective treatment variables (*AUDEXP* and *APTS,* respectively) and *ΔDISCVA.* Fixed effects, industry fixed effects, and all controls from the model (2) are included but are not presented for brevity. The interaction between *AUDEXP* and *ΔDISCVA* in Panel A show negative and significant coefficients when the dependent variable is *ΔPTI2, ΔPTI3,* and *ΔPTI4.* Overall, these results suggest that audit expertise strengthens the predictive power of discretionary changes in the VA.

How Auditors Influence the Predictive Power of the VA

We provide evidence that auditor characteristics, specifically audit expertise as well as APTS, improve the informative power of the change in discretionary VA. These auditor characteristics improve the informative power of the change in discretionary VA through enhanced knowledge or expertise gained through increased exposure and training with respect to auditing the VA, which includes constraining management's ability to bias the inputs of the VA to portray a more favorable company outlook. Additionally, the auditor's increased knowledge and expertise may enhance the ability to minimize management's optimistic bias in the estimates of the VA, and this reduced partiality could increase the association between the changes in the discretionary VA and future pretax income.

Auditor Knowledge—Changes in Auditor Firm Characteristics

We first consider a change in the audit firm's expertise of knowledge by identifying a sub-sample of companies that *do not* switch audit firms during the entire sample period. Of those that remain with the same audit firm, we identify which audit firms change from a non-industry expert (*AUDEXP=0)* to an industry expert (*AUDEXP = 1).* This allows us to examine the influence of auditor expertise while holding all other audit firm characteristics constant. Panel A of Table 10 estimates model (2) for the observations two years *before* the audit firm obtains expert status. Panel B of Table 10 estimates model (2) for observations one and two years *after* the auditor obtains expert status.

<<<Insert Table 10 here>>>

The insignificant coefficients in Panel A suggest there is not a significant relation between the change in discretionary VA and the predictive power of future pre-tax income for companies that do not change their audit firms, which have not yet achieved expert status. Contrary, the negative and significant coefficient on *ΔDISCVA* in Columns (3), and (5) suggest there is an association between the change in discretionary VA and the predictive power of future pre-tax income after companies' auditors become industry audit experts. Overall, these results further verify that auditor expertise influences the informativeness of the change in the VA through the knowledge attained from industry and tax expertise.

Additional Auditor Characteristics

In additional untabulated tests, we consider whether audit firm size (an additional auditor characteristic) is influencing the results. We examine this possibility by estimating model (2) and replicating Table 5 and Table 7 while restricting the sample to companies audited by Big 4 audit firms. This restriction creates a more homogenous sample regarding audit firm size and eliminates potential confounding effects of auditor characteristics associated by audit firm size. With the sample restriction, all results were consistent with those shown in Tables 5 and 7, providing evidence that the audit firm size is not influencing the results.[12]

VI. CONCLUSION

This paper provides direct large-sample evidence that discretionary changes in the deferred tax asset VA are useful for predicting changes in earnings for up to five years. We utilize the S&P Capital IQ dataset to estimate discretionary VA changes using direct measures of the VA. The generalizability of prior research was limited due to small hand-collected samples and large samples that relied on categorical variables; using our continuous variable, our results confirm prior research findings. Whereas prior research was only successful in systematically predicting earnings changes for three years into the future, we find that discretionary VA decisions systematically predict earnings changes for at least five years into the future.

The primary purpose of this paper, however, is to evaluate the role that auditors play in refining the management forecasts of future earnings inherent in VA estimates. Specifically, we examine whether audit firm expertise affects the predictive value of discretionary VA estimates for future earnings changes. We learn that audit expertise is critical to sound VA estimates. Indeed, companies that hire audit firms with audit expertise indicate very strong predictive value in VA estimates, while companies that do not hire audit firms with audit expertise indicate no predictive value in VA estimates. In other words, *all, or nearly all*, of the general predictive value of the discretionary VA is found among companies that hire industry experts. In further analyses, we find the results of this finding are due to knowledge attained from the expertise that better enables auditors to evaluate future-looking information.

Additionally, we find evidence that large amounts of APTS (i.e., companies with APTS fees equal or greater than the median) produce discretionary VA estimates that are stronger predictors of future earnings changes compared to companies that do not purchase APTS. This evidence supports the

[12] We also perform another restriction for observations that do not change auditors for five or ten years to eliminate the influence of companies changing audit firms. When including this restriction, our prior inferences do not change.

knowledge spillover view that audit firms become better auditors if they gain a deeper understanding of the client's business by providing both audit and tax services.

This paper addresses the fundamental issue of whether financial information is relevant to decision makers. In its 2010 Conceptual Framework, the FASB stated that relevant financial information must be either confirmatory, predictive, or both. By examining the association between discretionary VA changes and future earnings changes, this study directly assesses the predictive value inherent in the VA. Using a moderating variable approach, we assess the effects of audit expertise and APTS on future discretionary VA changes. We hope others will also consider evaluating financial information quality (as well as long-term measures of audit quality) using the yardstick that is motivated by the FASB's Conceptual Framework.

REFERENCES

Acito, A. A., C. E. Hogan, and R. D. Mergenthaler. 2017. The effects of PCAOB inspections on auditor-client relationships. *The Accounting Review* (forthcoming). doi:10.2308/accr-51811

Allen, E. J. 2012. *The Information Content of the Deferred Tax Valuation Allowance: Evidence from Venture Capital Backed IPO Firms.* Working paper, University of Southern California. Available at: https://ssrn.com/abstract=2161340

Bauman, C. C., M. P. Bauman, and R. F. Halsey. 2001. Do firms use the deferred tax asset valuation allowance to manage earnings? *The Journal of the American Taxation Association* 23 (s-1): 27–48. doi:10.2308/jata.2001.23.s-1.27

Beardsley, E. L., A. Imdieke, and T.C. Omer. 2017. *Auditor-Provided Non-Audit Services: Economic Bonding, Knowledge Spillover, or Both?* Working paper, University of Notre Dame and University of Nebraska-Lincoln.

Becker, C. L., M. L. DeFond, J. Jiambalvo, and K. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1–24. doi: 10.1111/j.1911-3846.1998.tb00547.x

Behn, B. K., J.-H. Choi, and T. Kang. 2008. Audit quality and properties of analyst earnings forecasts. *The Accounting Review* 83 (2): 327–349. doi:10.2308/accr.2008.83.2.327

Behn, B. K., T. V. Eaton, and J. R. Williams. 1998. The determinants of the deferred tax allowance account under SFAS No. 109. *Accounting Horizons* 12 (1): 63–78.

Burgstahler, D., W. B. Elliott, and M. Hanlon. 2002. *How Firms Avoid Losses: Evidence of Use of the Net Deferred Tax Asset Account.* Working paper, University of Washington, University of Illinois at Urbana-Champaign, and Massachusetts Institute of Technology. Available at: https://ssrn.com/abstract=355780

Cao, Y., L.A. Myers, and T.C. Omer. 2012. Does Company Reputation Matter for Financial Reporting Quality? Evidence from Restatements. *Contemporary Accounting Research* 29 (3): 956-990. doi: 10.1111/j.1911-3846.2011.01137.x

Capps, G., L. Koonce, and K. R. Petroni. 2016. Natural optimism in financial reporting: A state of mind. *Accounting Horizons* 30 (1): 79–91. doi:10.2308/acch-51277

Carcello, J. V., and A. L. Nagy. 2004. Audit firm tenure and fraudulent financial reporting. *Auditing: A Journal of Practice & Theory* 23 (2): 55–69. doi:10.2308/aud.2004.23.2.55

Cazier, R., S. Rego, X. Tian, and R. Wilson. 2016. *The Consistency of Mandatory and Voluntary Management Earnings Forecasts and Implications for Analyst and Investor Information Processing.* Working paper, University of Texas-El Paso, Indiana University, Ohio State University, and University of Oregon.

Choudhary, P., A. Koester, and R. J. Pawlewicz. 2017. *Auditor-Provided Tax Services and Income Tax Estimation Error.* Working paper, University of Arizona, Georgetown University, and George Mason University. Available at: https://ssrn.com/abstract=2320479

Christensen, B. E., A. J. Olson, and T. C. Omer. 2015. The role of audit firm expertise and knowledge spillover in mitigating earnings management through the tax accounts. *The Journal of the American Taxation Association* 37 (1): 3–36. Doi:10.2308/atax-50906

Christensen, T. E., G. H. Paik, and E. K. Stice. 2008. Creating a bigger bath using the deferred tax valuation allowance. *Journal of Business Finance & Accounting* 35 (5–6): 601–625. Doi:10.1111/j.1468-5957.2008.02092.x

Chyz, J. A., R. Gal-Or, V. Naiker, and D. Sharma. 2017. "The influence of auditor provided tax planning and tax compliance services in the 'tax transparency era.'" Working paper, University of Tennessee, Northeastern University, Monash University, and Kennesaw State University.

Clarkson, P. M. 2000. Auditor quality and the accuracy of management earnings forecasts. *Contemporary Accounting Research* 17 (4): 595–622. Doi: 10.1506/QFPH-W3X9-PTRF-Y2G2

Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *The Accounting Review* 83 (3): 757–787. Doi:10.2308/accr.2008.83.3.757

Cook, K. A., G. R. Huston, and T. C. Omer. 2008. Earnings management through effective tax rates: The effects of tax-planning investment and the Sarbanes-Oxley Act of 2002. *Contemporary Accounting Research* 25 (2): 447–471. Doi: 10.1506/car.25.2.6

Dhaliwal, D. S., C. A. Gleason, and L. F. Mills. 2004. Last-chance earnings management: Using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research* 21 (2): 431–459. Doi: 10.1506/TFVV-UYT1-NNYT-1YFH

Dhaliwal, D. S., S. E. Kaplan, R. C. Laux, and E. Weisbrod. 2013. The information content of tax expense for firms reporting losses. *Journal of Accounting Research* 51 (1): 135–164. Doi:10.1111/j.1475-679X.2012.00466.x

Drake, K. D., E. Engel, and M. Martin. 2017. *Money for Nothing? Using Loss Persistence Information from Tax Accounts to Examine Bonus Compensation in Loss-Making Firms.* Working paper, University of Arizona and University of Illinois at Chicago. Available at: https://ssrn.com/abstract=2824044

Drake, K. D., N. C. Goldman, and S. J. Lusch. 2016. Do income tax-related deficiencies in publicly disclosed PCAOB Part II reports influence audit client financial reporting of income tax accounts? *The Accounting Review* 91 (5): 1411–1439. Doi:10.2308/accr-51338

Dunn, K. A., and B. W. Mayhew. 2004. Audit firm industry specialization and client disclosure quality. *Review of Accounting Studies* 9 (1): 35–58. Doi:10.1023/B:RAST.0000013628.49401.69

Edwards, A. 2017. The deferred tax asset valuation allowance and firm creditworthiness. *The Journal of the American Taxation Association* (forthcoming). Doi:10.2308/atax-51846

Ferguson, A., J. R. Francis, and D. Stokes. 2003. The effects of firm-wide and office-level expertise on audit pricing. *The Accounting Review* 78 (2): 429–448. Doi:10.2308/accr.2003.78.2.429

Financial Accounting Standards Board. 2010. *Statement of Financial Accounting Concepts No. 8 Conceptual Framework for Financial Reporting: Chapter 1, 'The Objective of General Purpose Financial Reporting,' and Chapter 3, 'Qualitative Characteristics of Useful Financial Information,'* September. Available at: http://www.fasb.org/resources/ccurl/515/412/Concepts%20Statement%20No%208.pdf.

Finley, A. R., A. Ribal, and E. Weisbrod. 2017. *Releasing the Deferred Tax Valuation Allowance: Information Content and SEC Scrutiny.* Working paper, Claremont McKenna College and University of Miami-Florida.

Francis, J. R., E. L. Maydew, and H. C. Sparks. 1999. The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory* 18 (2): 17–34. doi:10.2308/aud.1999.18.2.17

Frank, M. M., and S. O. Rego. 2006. Do managers use the valuation allowance account to manage earnings around certain earnings targets? *The Journal of the American Taxation Association* 28 (1): 43–65. doi:10.2308/jata.2006.28.1.43

Gleason, C. A., and L. F. Mills. 2011. Do auditor-provided tax services improve the estimate of tax reserves? *Contemporary Accounting Research* 28 (5): 1484–1509. doi:10.1111/j.1911-3846.2010.01057.x

Goldman, N. C., M. K. Harris, and T. C. Omer. 2017. *Is Exposure to Complex Tax Issues Associated with Better Audit Quality of Income Tax Accounts?* Working paper, University of Texas at Dallas, Washington State University, and University of Nebraska at Lincoln.

Gul, F. A., S. Y. K. Fung, and B. Jaggi. 2009. Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. *Journal of Accounting and Economics* 47 (3): 265–287. doi:10.1016/j.jacceco.2009.03.001

Hainmueller, J. 2012. Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis* 20 (1): 25–46.

Hainmueller, J., and Y. Xu. 2013. Ebalance: A Stata package for entropy balancing. *Journal of Statistical Software* 54 (7): 1−18. doi:10.18637/jss.v054.i07
Hanlon, M., and S. Heitzman. 2010. A review of tax research. *Journal of Accounting and Economics* 50 (2–3): 127–178. doi:10.1016/j.jacceco.2010.09.002
Healy, P. M., and J. M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (4): 365–383. doi:10.2308/acch.1999.13.4.365
Hogan, C. E., and D. C. Jeter. 1999. Industry specialization by auditors. *Auditing: A Journal of Practice & Theory* 18 (1): 1–17. Available at: https://doi.org/10.2308/aud.1999.18.1.1
Hribar, P., and H. Yang. 2016. CEO overconfidence and management forecasting. *Contemporary Accounting Research* 33 (1): 204–227. doi:10.1111/1911-3846.12144
International Accounting Standards Board. 2010. *Conceptual Framework for Financial Reporting*. September. Available at: http://eifrs.ifrs.org/eifrs/bnstandards/en/framework.pdf.
Jackson, M. 2015. Book-tax differences and future earnings changes. *The Journal of the American Taxation Association* 37 (2): 49–73. doi:10.2308/atax-51164
Jung, D. J., and D. Pulliam. 2006. Predictive ability of the valuation allowance for deferred tax assets. *Academy of Accounting and Financial Studies Journal* 10(2): 49–70.
Krishnan, G. V., G. Visvanathan, and W. Yu. 2013. Do auditor-provided tax services enhance or impair the value relevance of earnings? *The Journal of the American Taxation Association* 35(1): 1−19. doi:10.2308/atax-50270
Kumar, K. R., and G. Visvanathan. 2003. The information content of the deferred tax valuation allowance. *The Accounting Review* 78 (2): 471–490. doi:10.2308/accr.2003.78.2.471
Lennox, C. S. 1999. Non-audit fees, disclosure and audit quality. *European Accounting Review* 8 (2): 239-252. doi:10.1080/096381899336014
Lev, B., and D. Nissim. 2004. Taxable income, future earnings, and equity values. *The Accounting Review* 79 (4): 1039–1074. doi:10.2308/accr.2004.79.4.1039
Lisic, L. L., L. A. Myers, R. J. Pawlewicz, and T. A. Seidel. 2017. *Do Accounting Firm Consulting Revenues Affect Audit Quality? Evidence from the Pre- and Post- SOX Eras.* Working paper, Virginia Polytechnic Institute and State University, University of Tennessee, George Mason Univeristy, and Brigham Young University.
Mayhew, B. W., and M. S. Wilkins. 2003. Audit firm industry specialization as a differentiation strategy: Evidence from fees charged to firms going public. *Auditing: A Journal of Practice & Theory* 22 (2): 33–52. Available at: https://doi.org/10.2308/aud.2003.22.2.33
McGuire, S. T., T. C. Omer, and D. Wang. 2012. Tax avoidance: Does tax-specific industry expertise make a difference? *The Accounting Review* 87 (3): 975–1003. doi:10.2308/accr-10215
Miller, G. S., and D. J. Skinner. 1998. Determinants of the valuation allowance for deferred tax assets under SFAS No. 109. *The Accounting Review* 73 (2): 213–233.
Palmrose, Z.-V. 1986. Audit fees and auditor size: Further evidence. *Journal of Accounting Research* 24 (1): 97−110. doi: 10.2307/2490806
Paterson, J. S., and A. Valencia. 2011. The effects of recurring and nonrecurring tax, audit-related, and other nonaudit services on auditor independence. *Contemporary Accounting Research* 28 (5): 1510-1536. doi:10.1111/j.1911-3846.2010.01060.x
Public Company Accounting Oversight Board. 2008. *Staff Audit Practice Alert No. 3: Audit Considerations in the Current Economic Environment* (December 5). Available at: https://pcaobus.org/Standards/QandA/12-05-2008_APA_3.pdf
Public Company Accounting Oversight Board. 2014. *Staff Consultation Paper: Auditing Accounting Estimates and Fair Value Measurements* (August 19). Available at: https://pcaobus.org/Standards/Documents/SCP_Auditing_Accounting_Estimates_Fair_Value_Measurements.pdf
Public Company Accounting Oversight Board. 2017. *Proposed Auditing Standard: Auditing Accounting Estimates, Including Fair Value Measurements and Proposed Amendments to PCAOB Auditing*

Standards. PCAOB Release No. 2017-002 (June 1). Available at: https://pcaobus.org/Rulemaking/Docket043/2017-002-auditing-accounting-estimates-proposed-rule.pdf

Reichelt, K. J., and D. Wang. 2010. National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research* 48 (3): 647–686. doi: 10.1111/j.1475-679X.2009.00363.x

Schipper, K. 1989. Commentary on earnings management. *Accounting Horizons* 3 (4): 91–102.

Schrand, C. M., and M. Wong. 2003. Earnings management using the valuation allowance for deferred tax assets under SFAS No. 109. *Contemporary Accounting Research* 20 (3): 579–611. doi:10.1506/480D-098U-607R-5D9W

Schrand, C. M., and S. L. Zechman. 2012. Executive overconfidence and the slippery slope to financial misreporting. *Journal of Accounting and Economics* 53 (1–2): 311–329. doi:10.1016/j.jacceco.2011.09.001

Srinidhi, B., and F. A. Gul. 2007. The differential effects of auditors' non-audit and audit fees on accrual quality. *Contemporary Accounting Research* 24 (2): 595-629. doi:10.1506/ARJ4-20P3-201K-3752

Weesie, J. 2000. SG121: Seemingly unrelated estimation and the cluster-adjusted sandwich estimator. *Stata Technical Bulletin* 52: 34–47.

Zang, A. Y. 2012. Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review* 87 (2): 675–703. doi:10.2308/accr-10196

APPENDIX

Variable Names and Definitions

Dependent Variables and Variables of Interest

$\Delta VA_{i,t}$ = VA for year *t* minus VA for year *t*-1 (CIQ item 46045), scaled by average assets (AT) for year *t* (S&P CIQ and Compustat);

$\Delta DISCVA_{i,t}$ = Residual from first-stage regression model (1) estimated by one-digit SIC:

$$\Delta VA_{i,t} = \beta_0 + \beta_1 \Delta NOLDTA_{i,t} + \beta_2 \Delta ODTA_{i,t} + \beta_3 \Delta DTL_{i,t} + \beta_4 \Delta PI_{i,t} + \beta_5 \Delta PI1_{i,t} + YEAR\_FE_{i,t} + \varepsilon_{i,t} ;$$

$\Delta PTI1_{i,t}$ = Pretax income (PI) for year *t*+1 scaled by average assets (AT) for year *t*+1, minus pretax income for year *t* scaled by average assets (AT) for year *t* (Compustat);

$\Delta PTI2_{i,t}$ = Average of scaled pretax income (PI) (i.e., scaled by the respective year's average assets [AT]) for years *t*+1 and *t*+2, minus pretax income (PI) scaled by average assets (AT) for year *t* (Compustat);

$\Delta PTI3_{i,t}$ = Average of scaled pretax income (PI) (i.e., scaled by the respective year's average assets [AT]) for years *t*+1 to *t*+3, minus pretax income (PI) scaled by average assets (AT) for year *t* (Compustat);

$\Delta PTI4_{i,t}$ = Average of scaled pretax income (PI) (i.e., scaled by the respective year's average assets [AT]) for years *t*+1 to *t*+4, minus pretax income (PI) scaled by average assets (AT) for year *t* (Compustat); and

$\Delta PTI5_{i,t}$ = Average of scaled pretax income (PI) (i.e., scaled by the respective year's average assets [AT]) for years *t*+1 to *t*+5, minus pretax income (PI) scaled by average assets (AT) for year *t* (Compustat).

First Stage (Model 1) Control Variables

$\Delta NOLDTA_{i,t}$ = Change in deferred tax assets arising from NOL carryforwards, measured as the NOL carryforward (TLCF) at the end of year *t* minus the NOL carryforward (TLCF) at the end of year *t*-1, multiplied by the statutory corporate tax rate during the sample period, 0.35, and divided by total assets (AT) at the end of year *t*-1 (Compustat);

$\Delta ODTA_{i,t}$ = Change in deferred tax assets arising from sources other than NOL carryforwards, measured as the scaled change in gross deferred tax assets minus the scaled change in deferred tax assets arising from NOL carryforwards ($\Delta NOLDTA_{i,t}$). The scaled change in gross deferred tax assets is the sum of year *t* net deferred tax assets (TXNDBA) and the year *t*'s VA (CIQ item 46045) minus the sum of year *t*-1's net deferred tax assets (TXNDBA) and the year *t-1* VA (CIQ item 46045), divided by total assets (AT) at the end of year *t*-1 (S&P CIQ and Compustat);

$\Delta DTL_{i,t}$ = Change in net deferred tax liability, measured as net deferred tax liability (TXNBL) for year *t* minus the net deferred tax liability (TXNBL) for year *t*-1, divided by total assets (AT) at the end of year *t*-1 (Compustat);

$\Delta PI_{i,t}$ = Change in pretax income from year *t*-1 to year *t*, measured as pretax income (PI) for year *t* divided by total assets at the end of year *t,* minus pretax income (PI) for year t-1 divided by total assets at the end of year t-1 (Compustat);

$\Delta PI1_{i,t}$ = Change in pretax income from year t-2 to year t-1, measured as pretax income (PI) for year t-1 divided by total assets at the end of year t-1*,* minus pretax income (PI) for year t-2 divided by total assets at the end of year t-2 (Compustat); and

$YEAR\_FE_{i,t}$ = Year fixed effects.

Second Stage Control Variables

$RD_{i,t}$ = R&D expenditures (XRD) for year t divided by sales (SALE) for year t (Compustat);

$CAP_{i,t}$ = Capital asset expenditures (CAPX) for year t divided by sales (SALE) for year t (Compustat);

$EP_{i,t}$ = Income before extraordinary items (IB) for year t divided by market value of equity (PRCC_F*CSHO) at the end of year t (Compustat);

$DIV_{i,t}$ = Dividends (DVC) for year t scaled by total assets (AT) at the end of year t (Compustat);

$BTM_{i,t}$ = Book-to-market value, measured as shareholders' equity (CEQ) at the end of year t divided by the market value of equity (PRCC_F*CSHO) at the end of year t (Compustat);

$OCF_{i,t}$ = Operating cash flow, measured as cash from operations (OANCF) for year t divided by total assets (AT) at the end of year t-1 (Compustat);

$ACC_{i,t}$ = Operating accruals at the end of year t, measured as operating income after depreciation (OIADP) for year t minus operating activities net cash flow (OANCF) for year t, divided by total assets (AT) at the end of year t-1 (Compustat);

$\Delta ROA_{i,t}$ = Change in ROA, measured as net income (NI) for year t minus net income (NI) for year t-1, divided by total assets (AT) at the end of year t (Compustat);

$\Delta ROA3_{i,t}$ = Three-year change in return on assets, measured as net income (NI) for year t minus net income (NI) for year t-3, divided by total assets (AT) at the end of year t (Compustat);

$\Delta ROA5_{i,t}$ = Five-year change in return on assets, measured as net income (NI) for year t minus net income (NI) for year t-5, divided by total assets (AT) at the end of year t (Compustat);

$ACQ_{i,t}$ = 1 if acquisition activity occurred during year t (i.e., ACQ>0), and 0 otherwise; (Compustat); and

$SIZE_{i,t}$ = Natural log of total assets (AT) at the end of year t (Compustat).

Variables Representing Auditors' Characteristics

$APTS_{i,t}$ = 1 if the cost of tax services obtained during year t from the external auditor (TAX_FEES) exceeds the 75th percentile of auditor-provided tax fees by firms in the sample having paid such fees, and 0 if no tax fees are reported as paid to the firm's auditors during year t (Audit Analytics);

$AUDEXP_{i,t}$ = 1 if the firm's auditor is an audit expert in year t, and 0 otherwise. Following McGuire et al. (2012), an auditor has industry audit expertise within the firm's home office city if the auditor receives fees totaling more than 30 percent of total audit fees paid to all other audit firms within the city and two-digit SIC; and

AUDEXP_ONLY$_{i,t}$ = 1 if the firm's auditor is an audit expert in year *t* and not a tax expert, and 0 otherwise. Following McGuire et al. (2012), an auditor has industry audit expertise within the firm's home office city if the auditor receives fees totaling more than 30 percent of total audit fees paid to all other audit firms within the city and two-digit SIC. An audit firm is a tax expert if an auditor has tax market share totaling more than 30 percent of total tax fees paid to all other audit firms within the city and two-digit SIC;

TAXEXP_ONLY$_{i,t}$ = 1 if the firm's auditor is a tax expert in year *t* and not an audit expert, and 0 otherwise. Following McGuire et al. (2012), an auditor has industry audit expertise within the firm's home office city if the auditor receives fees totaling more than 30 percent of total audit fees paid to all other audit firms within the city and two-digit SIC. An audit firm is a tax expert if an auditor has tax market share totaling more than 30 percent of total tax fees paid to all other audit firms within the city and two-digit SIC;

Subscripts *i* and *t* refer to firms and years, respectively, of sample observations.

TABLE 1
Sample Selection and Partitions

Panel A: Sample Selection

Intersection of Compustat and Audit Analytics for firm-years 2004–2015	67,143
Less: Financial institutions (SIC 6000–6999)	(14,436)
Less: Utilities (SIC 4900–4999)	(2,667)
Less: Observations missing SICH code to determine SIC	(503)
Less: Missing values of variables from Compustat or Audit Analytics	(28,479)
Less: Going-concern audit opinions or the business is discontinued	(5,639)
Less: Observations in single-digit industry codes with less than 50 firm-years	(46)
Sample firm-years	15,373
Unique firms in the sample	2,414

Panel B: Partitions of the Sample

Audit and tax expertise of the audit firm:	
AUDEXP = 1 (i.e., firm-years with an audit expert)	8,262
AUDEXP = 0 (i.e., firm-years without an audit expert)	7,111
	15,373
APTS fees:	
APTS = 1 (i.e., observations with APTS greater than or equal to the 50th percentile of tax fees among firms that report APTS fees)	5,631
APTS = missing	5,411
APTS = 0 (i.e., observations not reporting APTS fees)	4,331
	15,373
Exclusive Expertise:	
Industry audit expertise only: Firm-years with an audit firm with industry audit expertise but not industry tax expertise	1,822
Industry tax expertise only: Firm-years with an audit firm with industry tax expertise but not industry audit expertise	938

TABLE 2
Descriptive Statistics

Panel A: Measures of Central Tendency

Variable	n	Mean	Std. Dev.	Min.	25th Pctl.	50th Pctl.	75th Pctl.	Max.
ΔPTI1	15,373	-0.006	0.158	-0.649	-0.044	-0.001	0.036	0.633
ΔPTI2	13,611	-0.007	0.158	-0.642	-0.054	-0.005	0.038	0.633
ΔPTI3	11,734	-0.009	0.155	-0.608	-0.060	-0.007	0.038	0.585
ΔPTI4	10,021	-0.010	0.157	-0.646	-0.063	-0.009	0.039	0.581
ΔPTI5	8,439	-0.010	0.161	-0.681	-0.065	-0.010	0.040	0.579
ΔVA	15,373	0.014	0.093	-0.386	-0.001	0.000	0.010	0.446
ΔNOLDTA	15,373	0.022	0.136	-0.524	-0.002	0.000	0.014	0.749
ΔODTA	15,373	-0.006	0.127	-0.743	-0.011	0.002	0.014	0.557
ΔDTL	15,373	0.003	0.018	-0.054	-0.002	0.000	0.006	0.102
ΔPI	15,373	0.007	0.195	-0.728	-0.040	0.002	0.041	0.998
ΔPI1	15,373	0.006	0.205	-0.817	-0.042	0.002	0.042	1.023
ΔDISCVA	15,373	0.001	0.056	-0.661	-0.010	0.000	0.013	1.066
RD	15,373	0.619	3.316	0.000	0.006	0.040	0.150	29.268
CAP	15,373	0.062	0.141	0.001	0.017	0.030	0.054	1.191
EP	15,373	-0.043	0.259	-1.689	-0.042	0.032	0.059	0.317
BTM	15,373	0.501	0.502	-0.839	0.222	0.400	0.667	2.850
ΔROA	15,373	0.009	0.174	-0.652	-0.030	0.007	0.039	0.793
ΔROA3	15,373	0.023	0.240	-0.810	-0.039	0.016	0.067	1.185
ΔROA5	15,373	0.035	0.291	-0.880	-0.041	0.022	0.080	1.589
DIV	15,373	0.010	0.023	0.000	0.000	0.000	0.010	0.152
OCF	15,373	0.042	0.187	-0.809	0.014	0.083	0.136	0.362
ACC	15,373	-0.027	0.094	-0.423	-0.065	-0.016	0.023	0.219
ACQ	15,373	0.401	0.490	0.000	0.000	0.000	1.000	1.000
SIZE	15,373	6.079	2.236	1.061	4.479	6.126	7.654	11.439
AUDEXP	15,373	0.537	0.499	0.000	0.000	1.000	1.000	1.000
APTS	9,962	0.565	0.496	0.000	0.000	1.000	1.000	1.000
DTA/AT	15,373	0.049	0.051	0.000	0.013	0.037	0.068	0.276
VA/AT	15,373	0.351	0.835	0.000	0.002	0.016	0.244	5.140
VA/DTA	15,286	0.421	0.412	0.000	0.034	0.223	0.933	1.000
CURLOSS	15,373	0.335	0.472	0.000	0.000	0.000	1.000	1.000
VA_LOSS	5,115	0.777	0.341	0.000	0.695	0.974	1.000	1.000
VA_INC	10,171	0.242	0.317	0.000	0.007	0.098	0.326	1.000

TABLE 2 (Continued)

Panel B: Pearson (Spearman) Correlations Below (Above) the Diagonal

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) *ΔPTI1*		0.12	0.10	**0.01**	**-0.08**	-0.10	**-0.11**	**-0.04**	**0.01**	**-0.04**	-0.26	**-0.05**	**-0.13**	**-0.23**	**-0.21**	**-0.01**	**-0.10**	-0.10	**-0.01**	**0.02**	0.02	0.00	**0.00**	0.01
(2) *ΔVA*	0.16		0.48	0.10	-0.07	**-0.18**	**-0.10**	**0.34**	**0.22**	**0.09**	**-0.48**	**-0.07**	**-0.23**	**-0.34**	**-0.31**	**-0.12**	**-0.36**	**-0.21**	**-0.08**	**-0.14**	**-0.05**	**-0.02**	**-0.01**	**-0.10**
(3) *ΔNOLDTA*	0.11	**0.52**		-0.42	0.02	**-0.14**	**-0.07**	**-0.05**	**0.19**	**0.08**	**-0.38**	**-0.06**	**-0.15**	**-0.26**	**-0.22**	**-0.11**	**-0.35**	**-0.15**	**-0.05**	**-0.14**	**-0.04**	**-0.02**	**-0.02**	**-0.11**
(4) *ΔODTA*	-0.01	0.07	-0.71		**0.09**	-0.09	**0.01**	**0.09**	-0.05	**0.02**	**0.00**	**0.01**	-0.04	0.01	**-0.02**	0.01	**0.09**	-0.01	**0.03**	0.03	**0.01**	**0.02**	0.01	**0.01**
(5) *ΔDTL*	-0.04	-0.03	**0.04**	**0.04**		**-0.01**	0.04	0.16	**-0.09**	**0.06**	**0.15**	**-0.05**	**0.03**	**0.08**	**0.07**	**0.05**	**0.13**	**0.10**	**0.20**	**0.10**	**0.04**	**0.02**	**0.01**	**0.06**
(6) *ΔPI*	-0.17	-0.15	**-0.04**	**-0.08**	**0.02**		**-0.16**	-0.03	**-0.02**	**-0.09**	**0.24**	**-0.13**	**0.77**	**0.26**	**0.34**	**-0.03**	**0.13**	**0.10**	**-0.07**	**0.00**	**0.00**	-0.01	0.00	-0.01
(7) *ΔPI1*	-0.10	-0.04	**-0.03**	**0.01**	**0.04**	-0.32		**0.22**	-0.01	0.01	**0.14**	-0.08	-0.13	**0.17**	**0.31**	**0.00**	**0.09**	0.10	**0.01**	**0.02**	0.00	**-0.01**	0.00	0.03
(8) *ΔDISCVA*	0.01	0.45	-0.06	**-0.05**	**0.04**	**-0.05**	**0.13**		**0.06**	0.04	**-0.12**	**-0.09**	**-0.10**	**-0.07**	**-0.02**	**-0.03**	**-0.09**	**-0.03**	**-0.01**	**-0.05**	-0.01	**-0.01**	-0.01	-0.02
(9) *RD*	0.00	0.29	0.26	**-0.08**	**-0.01**	**-0.01**	-0.03	0.07		**0.10**	-0.40	**-0.20**	**-0.03**	**-0.06**	**-0.05**	**-0.30**	**-0.30**	**-0.31**	**-0.09**	**-0.30**	**-0.20**	**-0.10**	**0.00**	**-0.14**
(10) *CAP*	-0.03	0.20	**0.17**	**-0.06**	**0.01**	**-0.02**	0.01	**0.07**	0.65		-0.04	-0.12	**-0.11**	**-0.05**	**-0.07**	**0.00**	**0.07**	-0.15	**0.03**	**0.20**	**0.06**	**0.00**	**0.02**	0.09
(11) *EP*	-0.24	-0.32	**-0.20**	**0.02**	**0.11**	**0.27**	**0.07**	**-0.10**	**-0.15**	**-0.10**		**0.06**	0.29	**0.44**	**0.40**	**0.37**	**0.54**	**0.41**	**0.16**	**0.39**	**0.17**	**0.02**	**0.01**	**0.28**
(12) *BTM*	-0.05	-0.08	**-0.08**	**0.02**	**-0.04**	-0.09	**-0.05**	**-0.03**	**-0.08**	**-0.01**	**-0.17**		**-0.12**	-0.17	-0.16	-0.05	-0.14	**-0.05**	**0.04**	**-0.05**	**-0.02**	**0.01**	**0.00**	-0.03
(13) *ΔROA*	-0.23	-0.25	**-0.12**	**0.01**	**0.01**	0.74	-0.28	**-0.18**	**-0.07**	**-0.08**	**0.25**	**-0.07**		**0.34**	0.44	**-0.03**	**0.16**	**0.12**	**-0.06**	**-0.01**	**0.00**	-0.01	0.00	0.01
(14) *ΔROA5*	-0.20	-0.29	**-0.15**	**-0.01**	**0.02**	0.25	**0.10**	**-0.14**	**-0.14**	**-0.13**	**0.27**	**-0.12**	**0.31**		**0.55**	0.03	0.33	**0.22**	**0.02**	**0.04**	**-0.01**	**-0.02**	0.02	**0.03**
(15) *ΔROA3*	-0.24	-0.28	**-0.14**	**-0.02**	**0.03**	**0.32**	**0.19**	**-0.10**	**-0.10**	**-0.12**	**0.28**	**-0.11**	**0.42**	**0.48**		0.00	0.25	0.22	-0.01	0.03	0.01	**-0.01**	0.02	0.04
(16) *DIV*	-0.01	**-0.08**	-0.09	**0.03**	**-0.01**	**-0.01**	-0.01	0.00	-0.07	-0.07	**0.15**	**-0.12**	**-0.01**	**0.01**	0.00		0.32	0.26	**0.13**	**0.41**	**0.18**	**0.01**	**-0.02**	0.30
(17) *OCF*	-0.10	-0.50	**-0.46**	**0.16**	**0.04**	**0.06**	**0.05**	**-0.10**	**-0.45**	**-0.28**	**0.40**	**0.05**	**0.09**	**0.17**	**0.14**	0.23		-0.02	0.18	**0.37**	0.12	0.04	0.02	**0.25**
(18) *ACC*	-0.10	-0.23	**-0.16**	**-0.01**	**0.06**	0.04	**0.05**	**0.00**	**-0.19**	-0.16	**0.26**	**-0.01**	**0.08**	0.10	**0.13**	**0.17**	0.11		0.12	0.26	**0.13**	**0.02**	**0.00**	**0.20**
(19) ACQ	0.00	-0.09	-0.07	**0.03**	**0.19**	**-0.06**	**0.00**	**0.00**	-0.12	-0.09	**0.14**	**-0.01**	**-0.06**	-0.02	**-0.04**	**0.02**	**0.22**	**0.13**		0.38	0.13	0.03	0.00	**0.25**
(20) SIZE	0.01	-0.16	-0.16	**0.06**	**0.08**	**-0.04**	**-0.02**	**-0.01**	**-0.16**	-0.06	**0.26**	**-0.07**	**-0.03**	**-0.06**	**-0.03**	**0.19**	**0.41**	**0.27**	0.37		0.40	0.07	-0.01	**0.62**
(21) *AEXP*	0.02	-0.04	-0.05	**0.03**	**0.02**	**-0.02**	**-0.01**	**-0.01**	-0.07	-0.06	**0.10**	**-0.04**	**-0.01**	**-0.04**	-0.02	**0.06**	**0.14**	**0.12**	0.13	0.40		0.34	-0.28	0.29
(22) *AUDEXP_ONLY*	0.00	**-0.01**	-0.02	**0.02**	**0.01**	-0.01	-0.01	0.00	-0.03	-0.01	**0.01**	**0.02**	-0.01	**-0.02**	-0.01	**-0.02**	0.05	**0.02**	**0.03**	**0.06**	**0.34**		-0.09	-0.27
(23) *TAXEXP_ONLY*	-0.01	**-0.02**	0.00	**-0.01**	0.01	0.00	-0.01	-0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.01	0.00	-0.01	-0.28	-0.09		**0.13**
(24) *APTS*	0.00	-0.13	-0.12	**0.04**	**0.05**	**-0.03**	**0.01**	**0.00**	-0.14	-0.09	0.18	**-0.10**	-0.01	**-0.01**	0.01	0.15	0.29	0.20	0.25	0.61	0.29	-0.27	0.13	

Independent continuous variables are winsorized at the 1st and 99th percentiles. Coefficients in bold are significantly different from zero at the 0.01 level. Complete variable definitions are provided in the appendix.

TABLE 2 (Continued)

Panel C: Descriptive Statistics and Univariate Comparisons of Partitions Based on Audit Expert Status

	Expert Auditor (*AUDEXP* = 1)			Non-Expert Auditor (*AUDEXP* = 0)			Statistical Significance of Differences in:	
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**	**Means**	**Medians**
ΔPTI1	8,262	-0.004	0.000	7,111	-0.008	-0.003	0.061	0.000
ΔPTI2	7,365	-0.005	-0.004	6,246	-0.010	-0.006	0.065	0.049
ΔPTI3	6,412	-0.005	-0.006	5,322	-0.013	-0.010	0.004	0.002
ΔPTI4	5,533	-0.006	-0.007	4,488	-0.015	-0.013	0.003	0.000
ΔPTI5	4,706	-0.005	-0.008	3,733	-0.017	-0.013	0.001	0.021
ΔVA	8,262	0.010	0.000	7,111	0.018	0.000	0.000	0.027
ΔNOLDTA	8,262	0.016	0.000	7,111	0.030	0.000	0.000	0.000
ΔODTA	8,262	-0.002	0.002	7,111	-0.010	0.001	0.000	0.177
ΔDTL	8,262	0.003	0.000	7,111	0.003	0.000	0.005	0.000
ΔPI	8,262	0.003	0.002	7,111	0.011	0.001	0.009	0.122
ΔPI1	8,262	0.004	0.002	7,111	0.009	0.000	0.131	0.088
ΔDISCVA	8,262	0.001	0.000	7,111	0.001	0.001	0.384	0.162
RD	8,262	0.399	0.022	7,111	0.875	0.071	0.000	0.000
CAP	8,262	0.054	0.032	7,111	0.071	0.028	0.000	0.000
EP	8,262	-0.019	0.041	7,111	-0.071	0.018	0.000	0.000
BTM	8,262	0.480	0.395	7,111	0.524	0.408	0.000	0.044
ΔROA	8,262	0.007	0.007	7,111	0.011	0.006	0.116	0.565
ΔROA3	8,262	0.020	0.016	7,111	0.027	0.015	0.068	0.423
ΔROA5	8,262	0.025	0.022	7,111	0.046	0.022	0.000	0.716
DIV	8,262	0.011	0.000	7,111	0.008	0.000	0.000	0.000
OCF	8,262	0.065	0.091	7,111	0.014	0.070	0.000	0.000
ACC	8,262	-0.017	-0.007	7,111	-0.039	-0.028	0.000	0.000
ACQ	8,262	0.460	0.000	7,111	0.333	0.000	0.000	0.000
SIZE	8,262	6.913	6.932	7,111	5.110	5.050	0.000	0.000

TABLE 2 (Continued)

Panel D: Descriptive Statistics and Univariate Comparisons of Partitions Based on APTS Status

Variable	Firm-Years with APTS Fees Exceeding or equal to the median of APTS Fees (*APTS* = 1) N	Mean	Median	Firm-Years with No Reported APTS Fees (*APTS* = 0) N	Mean	Median	Statistical Significance of Differences in: Means	Medians
ΔPTI1	5,631	-0.005	-0.000	4,331	-0.006	-0.003	0.656	0.052
ΔPTI2	5,052	-0.006	-0.004	3,755	-0.007	-0.007	0.732	0.007
ΔPTI3	4,399	-0.006	-0.006	3,165	-0.011	-0.010	0.139	0.022
ΔPTI4	3,786	-0.007	-0.008	2,650	-0.013	-0.012	0.070	0.024
ΔPTI5	3,216	-0.007	-0.009	2,201	-0.012	-0.012	0.206	0.088
ΔVA	5,631	0.003	0.000	4,331	0.024	0.000	0.000	0.032
ΔNOLDTA	5,631	0.006	0.000	4,331	0.036	0.000	0.000	0.000
ΔODTA	5,631	0.000	0.002	4,331	-0.009	0.002	0.000	0.968
ΔDTL	5,631	0.004	0.001	4,331	0.002	0.000	0.000	0.000
ΔPI	5,631	0.001	0.002	4,331	0.011	0.002	0.005	0.936
ΔPI1	5,631	0.006	0.003	4,331	0.002	-0.001	0.306	0.009
ΔDISCVA	5,631	0.001	-0.000	4,331	0.001	0.001	0.856	0.029
RD	5,631	0.129	0.025	4,331	0.957	0.062	0.000	0.000
CAP	5,631	0.048	0.033	4,331	0.072	0.028	0.000	0.000
EP	5,631	0.008	0.046	4,331	-0.085	0.008	0.000	0.000
BTM	5,631	0.450	0.388	4,331	0.544	0.401	0.000	0.063
ΔROA	5,631	0.007	0.007	4,331	0.010	0.006	0.344	0.312
ΔROA5	5,631	0.023	0.017	4,331	0.017	0.013	0.183	0.014
ΔROA3	5,631	0.025	0.023	4,331	0.031	0.019	0.258	0.017
DIV	5,631	0.013	0.000	4,331	0.007	0.000	0.000	0.000
OCF	5,631	0.099	0.101	4,331	-0.001	0.057	0.000	0.000
ACC	5,631	-0.007	-0.003	4,331	-0.043	-0.029	0.000	0.000
ACQ	5,631	0.555	1.000	4,331	0.303	0.000	0.000	0.000
SIZE	5,631	7.728	7.717	4,331	4.973	4.965	0.000	0.000

This table presents descriptive statistics for the regression variables. Panel A reports distributional characteristics of the variables across the entire sample; Panel B reports univariate correlations between the variables; Panel C compares the variables partitioned on whether financial statement attestation is performed by an audit expert (i.e., *AUDEXP* = 1 vs. *AUDEXP* = 0); and Panel D compares the variables partitioned on whether a) the auditor receives substantial APTS fees (i.e., APTS fees greater than the median of reported APTS fees) or b) there are no reported APTS fees. Continuous independent variables are winsorized at the 1st and 99th percentiles. Complete variable definitions are provided in the appendix. In Panels C and D, means (medians) are compared using parametric *t*-tests (non-parametric *k*-sample tests for the equality of medians); two-tail *p*-values are reported in the last two columns.

TABLE 3
First-Stage OLS Regression Results to Estimate the Change in the VA

$$\Delta VA = \beta_0 + \beta_1 \Delta NOLDTA + \beta_2 \Delta ODTA + \beta_3 \Delta DTL + \beta_4 \Delta PI + \beta_5 \Delta PI1 + YEAR\_FE + \varepsilon \qquad (1)$$

Independent Variables	**Pred. Sign**	**1xxx Mining & Construct. (1)**	**2xxx Manuf. (2)**	**3xxx Manuf. (3)**	**4xxx Transport (4)**	**5xxx Wholesale Trade (5)**	**7xxx Services (6)**	**8xxx Services (7)**
ΔNOLDTA	+	0.959***	0.791***	0.748***	0.768***	0.867***	0.810***	0.870***
		(28.217)	(86.457)	(103.466)	(16.979)	(41.438)	(59.135)	(42.328)
ΔODTA	+	0.952***	0.637***	0.594***	0.870***	0.735***	0.719***	0.736***
		(28.005)	(62.326)	(79.284)	(19.218)	(36.451)	(51.836)	(32.596)
ΔDTL	–	-0.289***	-0.618***	-0.568***	-0.205	-0.446***	-0.580***	-0.731***
		(3.759)	(10.742)	(15.714)	(0.892)	(8.284)	(9.893)	(6.950)
ΔPI	–	-0.004	-0.013***	-0.032***	-0.078***	-0.017**	-0.026***	-0.010
		(0.364)	(2.612)	(8.376)	(3.545)	(2.067)	(4.267)	(0.890)
ΔPI1	–	-0.010	-0.022***	-0.009**	-0.008	-0.015*	0.004	-0.042***
		(0.805)	(4.804)	(2.391)	(0.392)	(1.803)	(0.707)	(3.969)
Year Fixed Effects?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		122	3,301	6,897	191	2,042	2,215	605
Adjusted R^2		0.885	0.704	0.632	0.711	0.494	0.634	0.777

***, **, and * denote significance levels at 0.01, 0.05, and 0.10, respectively (two-tail); *t*-statistics are reported in parentheses. The table presents the results of estimating model (1) across pooled firms *i* and years *t* within each one-digit SIC industry included in the sample (subscripts omitted for brevity). Residuals from this regression become *ΔDISCVA* in subsequent tests. Continuous independent variables are winsorized at the 1st and 99th percentiles. Complete variable definitions are provided in the appendix.

TABLE 4
The Association Between the Change in Discretionary VA and Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

$$\Delta PTI1_{i,t} \ldots \Delta PTI5_{i,t} = \beta_0 + \beta_1 \Delta DISCVA_{i,t} + \beta_2 RD_{i,t} + \beta_3 CAP_{i,t} + \beta_4 EP_{i,t} + \beta_5 BTM_{i,t} + \beta_6 \Delta ROA_{i,t} + \beta_7 \Delta ROA3_{i,t} + \beta_8 \Delta ROA5_{i,t} + \beta_9 DIV_{i,t} + \beta_{10} OCF_{i,t} + \beta_{11} ACC_{i,t} + \beta_{12} ACQ_{i,t} + \beta_{13} SIZE_{i,t} + INDUSTRY\_FE_{i,t} + YEAR\_FE_{i,t} + \varepsilon_{i,t} \quad (2)$$

Independent Variable	*ΔPTI1*	*ΔPTI2*	*ΔPTI3*	*ΔPTI4*	*ΔPTI5*
ΔDISCVA	-0.151***	-0.150***	-0.118**	-0.149**	-0.157**
	(3.243)	(3.008)	(2.082)	(2.427)	(2.378)
RD	-0.002**	-0.003**	-0.003**	-0.004**	-0.005**
	(2.176)	(2.147)	(2.212)	(2.270)	(2.119)
CAP	-0.059***	-0.068***	-0.074***	-0.088***	-0.104***
	(2.873)	(3.062)	(2.931)	(2.903)	(2.833)
EP	-0.105***	-0.109***	-0.109***	-0.112***	-0.115***
	(11.002)	(9.691)	(8.680)	(7.814)	(6.983)
BTM	-0.035***	-0.036***	-0.030***	-0.029***	-0.026***
	(10.176)	(9.927)	(7.773)	(6.455)	(4.965)
ΔROA	-0.131***	-0.176***	-0.160***	-0.152***	-0.164***
	(8.117)	(9.241)	(8.618)	(7.926)	(8.086)
ΔROA3	-0.071***	-0.068***	-0.082***	-0.087***	-0.081***
	(5.630)	(4.774)	(5.829)	(6.142)	(5.209)
ΔROA5	-0.039***	-0.041***	-0.029**	-0.034**	-0.039***
	(3.768)	(3.715)	(2.434)	(2.550)	(2.586)
DIV	0.031	0.067	0.083	0.067	0.050
	(0.595)	(1.099)	(1.126)	(0.809)	(0.481)
OCF	-0.043***	-0.091***	-0.114***	-0.135***	-0.157***
	(2.591)	(4.641)	(5.138)	(5.068)	(4.890)
ACC	-0.082***	-0.150***	-0.179***	-0.212***	-0.220***
	(3.121)	(5.161)	(5.511)	(5.698)	(5.029)
ACQ	0.000	-0.001	-0.002	-0.002	-0.002
	(0.018)	(0.507)	(0.582)	(0.504)	(0.691)
SIZE	0.004***	0.005***	0.007***	0.008***	0.009***
	(5.286)	(6.763)	(7.951)	(7.967)	(7.764)
Standard errors clustered by firm	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	15,373	13,611	11,734	10,021	8,439
Adjusted R^2	0.145	0.198	0.208	0.222	0.231

***, **, and * denote significance levels at 0.01, 0.05, and 0.10, respectively (two-tail); t-statistics are reported in parentheses. The table presents results of estimating model (2) reported above. The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variable of interest, *ΔDISCVA,* is the residual from model (1) reported in Table 3. Continuous independent variables are winsorized at the 1st and 99th percentiles. Complete variable definitions are provided in the appendix.

TABLE 5
The Effects of Types of Auditor Expertise on the Power of Discretionary Changes in the VA to Predict Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

$$\Delta PTI1_{i,t} \ldots \Delta PTI5_{i,t} = \beta_0 + \beta_1 \Delta DISCVA_{i,t} + \beta_2 RD_{i,t} + \beta_3 CAP_{i,t} + \beta_4 EP_{i,t} + \beta_5 BTM_{i,t} + \beta_6 \Delta ROA_{i,t} + \beta_7 \Delta ROA3_{i,t} + \beta_8 \Delta ROA5_{i,t} + \beta_9 DIV_{i,t} + \beta_{10} OCF_{i,t} + \beta_{11} ACC_{i,t} + \beta_{12} ACQ_{i,t} + \beta_{13} SIZE_{i,t} + INDUSTRY\_FE_{i,t} + YEAR\_FE_{i,t} + \varepsilon_{i,t} \quad (2)$$

	Auditor is Audit Expert (*AUDEXP* = 1)					Auditor is Not Audit Expert (*AUDEXP* = 0)				
Independent Variable	***ΔPTI1* (1)**	***ΔPTI2* (2)**	***ΔPTI3* (3)**	***ΔPTI4* (4)**	***ΔPTI5* (5)**	***ΔPTI1* (6)**	***ΔPTI2* (7)**	***ΔPTI3* (8)**	***ΔPTI4* (9)**	***ΔPTI5* (10)**
ΔDISCVA	-0.249***	-0.283***	-0.284***	-0.322***	-0.327***	-0.113*	-0.101	-0.058	-0.088	-0.097
	(4.050)	(4.355)	(4.024)	(4.468)	(4.339)	(1.877)	(1.549)	(0.782)	(1.091)	(1.109)
RD	0.001	0.000	-0.000	-0.003	-0.003	-0.004***	-0.004***	-0.005**	-0.005**	-0.006**
	(0.799)	(0.075)	(0.055)	(0.876)	(0.955)	(3.019)	(2.660)	(2.556)	(2.178)	(2.021)
CAP	-0.083***	-0.095***	-0.089**	-0.092*	-0.096*	-0.046*	-0.052*	-0.065**	-0.084**	-0.106**
	(2.935)	(2.938)	(2.370)	(1.961)	(1.957)	(1.761)	(1.879)	(2.057)	(2.233)	(2.275)
EP	-0.101***	-0.107***	-0.110***	-0.110***	-0.113***	-0.112***	-0.116***	-0.112***	-0.115***	-0.117***
	(8.340)	(7.712)	(7.958)	(7.057)	(6.306)	(8.162)	(7.059)	(5.545)	(4.972)	(4.406)
BTM	-0.033***	-0.031***	-0.028***	-0.026***	-0.025***	-0.037***	-0.042***	-0.033***	-0.031***	-0.027***
	(8.592)	(7.040)	(6.169)	(5.023)	(4.316)	(7.166)	(7.478)	(5.312)	(4.286)	(3.091)
ΔROA	-0.184***	-0.208***	-0.197***	-0.194***	-0.185***	-0.105***	-0.160***	-0.141***	-0.130***	-0.152***
	(7.859)	(7.712)	(7.119)	(7.408)	(7.319)	(5.019)	(6.577)	(5.888)	(5.090)	(5.285)
ΔROA3	-0.079***	-0.080***	-0.092***	-0.103***	-0.099***	-0.068***	-0.063***	-0.076***	-0.079***	-0.073***
	(4.618)	(4.563)	(5.412)	(6.205)	(5.716)	(3.997)	(3.230)	(3.876)	(3.875)	(3.213)
ΔROA5	-0.032**	-0.023	-0.022	-0.051***	-0.062***	-0.042***	-0.050***	-0.032**	-0.027	-0.028
	(2.095)	(1.597)	(1.504)	(3.249)	(3.658)	(3.131)	(3.308)	(2.036)	(1.528)	(1.376)
DIV	0.010	0.046	0.049	-0.017	-0.057	0.036	0.073	0.091	0.087	0.095
	(0.160)	(0.650)	(0.631)	(0.204)	(0.632)	(0.451)	(0.795)	(0.819)	(0.633)	(0.534)
OCF	-0.012	-0.066***	-0.093***	-0.099***	-0.121***	-0.059**	-0.105***	-0.128***	-0.156***	-0.184***
	(0.613)	(2.917)	(3.581)	(3.246)	(3.295)	(2.473)	(3.704)	(4.035)	(4.159)	(4.194)
ACC	-0.100***	-0.172***	-0.214***	-0.229***	-0.261***	-0.063*	-0.129***	-0.152***	-0.191***	-0.180***
	(2.850)	(4.506)	(5.147)	(5.326)	(5.703)	(1.708)	(3.165)	(3.342)	(3.538)	(2.742)

TABLE 5 (Continued)

ACQ	0.002	-0.000	-0.000	-0.001	0.000	-0.003	-0.002	-0.003	-0.003	-0.005
	(0.941)	(0.116)	(0.030)	(0.357)	(0.023)	(0.796)	(0.513)	(0.625)	(0.507)	(0.842)
SIZE	0.003^{***}	0.004^{***}	0.006^{***}	0.006^{***}	0.006^{***}	0.005^{***}	0.006^{***}	0.008^{***}	0.010^{***}	0.012^{***}
	(3.011)	(4.547)	(5.143)	(5.034)	(4.951)	(4.134)	(4.615)	(5.718)	(5.986)	(5.949)
Std. err. cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,262	7,365	6,412	5,533	4,706	7,111	6,246	5,322	4,488	3,733
Adjusted R^2	0.180	0.227	0.257	0.294	0.312	0.130	0.185	0.183	0.187	0.199

This table presents results of estimating model (2) partitions based on whether the firm's auditor possesses audit expertise (*AUDEXP* = 1) or does not possess audit expertise (*AUDEXP* = 0). *t*-values are reported in parentheses. ***, **, and * denote significance levels at the 0.01, 0.05, and 0.10, respectively (two-tail). The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variable of interest, *ΔDISCVA,* is the residual from model (1) reported in Table 3. All variables are defined in the appendix. Continuous independent variables are winsorized at the 1st and 99th percentiles. Comparisons of the coefficients from Columns (1) through (5) with (6) through (10), respectively, indicate that the coefficients of *ΔDISCVA* are significantly different across the two levels of *AUDEXP*; chi-square statistics indicate two-tail insignificance for the comparison of (1) with (6) and p<0.05 for the other four comparisons.

TABLE 6
The Effects of Audit Expertise only Vs. Tax Expertise Only on the Power of Discretionary Changes in the VA to Predict Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

$$\Delta PTI1_{i,t} \ldots \Delta PTI5_{i,t} = \beta_0 + \beta_1 \Delta DISCVA_{i,t} + \beta_2 RD_{i,t} + \beta_3 CAP_{i,t} + \beta_4 EP_{i,t} + \beta_5 BTM_{i,t} + \beta_6 \Delta ROA_{i,t} + \beta_7 \Delta ROA3_{i,t} + \beta_8 \Delta ROA5_{i,t} + \beta_9 DIV_{i,t} + \beta_{10} OCF_{i,t} + \beta_{11} ACC_{i,t} + \beta_{12} ACQ_{i,t} + \beta_{13} SIZE_{i,t} + INDUSTRY\_FE_{i,t} + YEAR\_FE_{i,t} + \varepsilon_{i,t} \quad (2)$$

	Auditor Expertise Only					**Tax Expertise Only**				
Independent Variables	***ΔPTI1* (1)**	***ΔPTI2* (2)**	***ΔPTI3* (3)**	***ΔPTI4* (4)**	***ΔPTI5* (5)**	***ΔPTI1* (6)**	***ΔPTI2* (7)**	***ΔPTI3* (8)**	***ΔPTI4* (9)**	***ΔPTI5* (10)**
ΔDISCVA	-0.245**	-0.234**	-0.258**	-0.349***	-0.345***	0.076	0.204	0.001	-0.063	-0.210
	(2.084)	(2.039)	(2.219)	(3.010)	(2.782)	(0.464)	(1.024)	(0.004)	(0.339)	(0.842)
RD	-0.001	-0.007**	-0.012***	-0.012**	-0.011*	-0.006**	-0.006*	-0.012***	-0.020***	-0.022***
	(0.240)	(2.250)	(3.138)	(2.442)	(1.951)	(2.374)	(1.670)	(3.066)	(4.304)	(3.397)
CAP	-0.163***	-0.107*	0.005	0.017	-0.017	0.005	-0.005	-0.042	-0.053	-0.070
	(2.958)	(1.960)	(0.063)	(0.229)	(0.244)	(0.097)	(0.085)	(0.529)	(0.528)	(0.566)
EP	-0.084***	-0.079***	-0.083***	-0.104***	-0.122***	-0.150***	-0.141***	-0.140***	-0.119***	-0.122***
	(3.893)	(3.267)	(3.739)	(4.084)	(3.993)	(4.530)	(4.229)	(4.116)	(3.475)	(3.351)
BTM	-0.025***	-0.020***	-0.024***	-0.022***	-0.020**	-0.077***	-0.070***	-0.050***	-0.038***	-0.027*
	(3.928)	(2.738)	(3.061)	(2.593)	(2.058)	(5.502)	(5.039)	(4.138)	(2.897)	(1.736)
ΔROA	-0.220***	-0.221***	-0.206***	-0.193***	-0.173***	-0.049	-0.120**	-0.096	-0.023	-0.043
	(4.276)	(4.217)	(3.736)	(3.766)	(3.236)	(1.001)	(2.135)	(1.543)	(0.353)	(0.627)
ΔROA3	-0.026	-0.060	-0.085**	-0.059*	-0.047	-0.026	-0.034	-0.065	-0.041	-0.036
	(0.806)	(1.575)	(2.146)	(1.824)	(1.430)	(0.798)	(0.959)	(1.487)	(1.063)	(0.839)
ΔROA5	-0.036	-0.030	-0.016	-0.101***	-0.114***	-0.099**	-0.069	-0.015	0.034	0.063
	(1.367)	(1.072)	(0.529)	(2.719)	(2.843)	(2.124)	(1.481)	(0.334)	(0.650)	(0.938)
DIV	-0.087	0.031	0.129	0.171	0.040	0.243*	0.130	0.044	0.127	0.129
	(0.637)	(0.137)	(0.553)	(0.738)	(0.218)	(1.711)	(0.956)	(0.306)	(0.723)	(0.496)
OCF	-0.052	-0.088*	-0.122*	-0.062	-0.054	-0.059	-0.126*	-0.202**	-0.255***	-0.309***
	(1.061)	(1.671)	(1.844)	(0.837)	(0.607)	(0.922)	(1.876)	(2.473)	(3.397)	(3.619)
ACC	-0.092	-0.097	-0.147*	-0.091	-0.152	-0.007	-0.085	-0.225**	-0.387***	-0.333**
	(1.463)	(1.270)	(1.809)	(1.053)	(1.571)	(0.095)	(1.161)	(2.175)	(3.287)	(2.340)
ACQ	0.002	-0.002	0.004	0.006	0.005	-0.007	0.003	0.008	0.006	0.004
	(0.303)	(0.416)	(0.562)	(0.836)	(0.648)	(0.761)	(0.362)	(0.851)	(0.629)	(0.332)
SIZE	0.003	0.005**	0.005**	0.006**	0.008***	0.003	0.003	0.005	0.007*	0.010**
	(1.315)	(2.053)	(2.034)	(2.338)	(2.939)	(1.031)	(0.857)	(1.537)	(1.766)	(2.028)

TABLE 6 (Continued)

Std. errors cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,822	1,622	1,374	1,178	999	938	840	727	600	499
Adjusted R^2	0.171	0.223	0.240	0.302	0.319	0.185	0.241	0.246	0.247	0.243

This table presents results of estimating model (2) separately for partitions based on whether the firm's auditor is only an auditor industry expert *or* is only a tax expert. Columns (1)-(5) include firm-years where the auditor possesses industry audit expertise but not industry tax expertise, and columns (6)-(10) include firm-years where the auditor possesses industry tax expertise but not industry audit expertise. A firm retains an audit (tax) industry expert if the auditor earns fees of more than 30 percent of total audit (tax) fees paid to all audit firms within the city and two-digit SIC. The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variable of interest, *ΔDISCVA,* is the residual from model (1) reported in Table 3. All variables are defined in the appendix. Continuous independent variables are winsorized at the 1st and 99th percentiles. *t*-values are reported in parentheses; ***, **, and * denote significance levels at the 0.01, 0.05, and 0.10, respectively (two-tail).

TABLE 7
The Effects of APTS on the Power of Discretionary Changes in the VA to Predict Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

$$\Delta PTI1_{i,t}\ldots\Delta PTI5_{i,t} = \beta_0 + \beta_1\Delta DISCVA_{i,t} + \beta_2 RD_{i,t} + \beta_3 CAP_{i,t} + \beta_4 EP_{i,t} + \beta_5 BTM_{i,t} + \beta_6\Delta ROA_{i,t} + \beta_7\Delta ROA3_{i,t} + \beta_8\Delta ROA5_{i,t} + \beta_9 DIV_{i,t} + \beta_{10}OCF_{i,t} + \beta_{11}ACC_{i,t} + \beta_{12}ACQ_{i,t} + \beta_{13}SIZE_{i,t} + INDUSTRY\_FE_{i,t} + YEAR\_FE_{i,t} + \varepsilon_{i,t} \quad (2)$$

	Auditor Provides Substantial Tax Services (*APTS* = 1)					Auditor Provides No Tax Services (*APTS* = 0)				
Independent Variables	***ΔPTI1*** **(1)**	***ΔPTI2*** **(2)**	***ΔPTI3*** **(3)**	***ΔPTI4*** **(4)**	***ΔPTI5*** **(5)**	***ΔPTI1*** **(6)**	***ΔPTI2*** **(7)**	***ΔPTI3*** **(8)**	***ΔPTI4*** **(9)**	***ΔPTI5*** **(10)**
ΔDISCVA	-0.341***	-0.324***	-0.281***	-0.317***	-0.283***	-0.044	-0.047	-0.002	-0.049	-0.065
	(4.330)	(4.681)	(4.219)	(4.344)	(3.919)	(0.579)	(0.605)	(0.025)	(0.527)	(0.708)
RD	-0.003	-0.006	-0.002	-0.009**	-0.013***	-0.002	-0.002	-0.003	-0.004	-0.004
	(1.012)	(1.603)	(0.632)	(2.098)	(2.954)	(1.431)	(1.235)	(1.440)	(1.611)	(1.540)
CAP	-0.030	0.004	-0.045	-0.008	-0.009	-0.060**	-0.082***	-0.055*	-0.077**	-0.121***
	(1.033)	(0.104)	(1.422)	(0.309)	(0.319)	(2.109)	(2.617)	(1.803)	(2.058)	(2.726)
EP	-0.122***	-0.117***	-0.117***	-0.121***	-0.118***	-0.088***	-0.082***	-0.070***	-0.066**	-0.066**
	(7.443)	(7.278)	(7.890)	(7.665)	(7.124)	(4.811)	(3.661)	(2.750)	(2.316)	(2.047)
BTM	-0.042***	-0.048***	-0.044***	-0.041***	-0.040***	-0.029***	-0.030***	-0.020***	-0.021***	-0.022**
	(7.110)	(8.305)	(7.713)	(6.864)	(6.094)	(4.877)	(4.652)	(2.944)	(2.676)	(2.363)
ΔROA	-0.121***	-0.154***	-0.153***	-0.148***	-0.165***	-0.152***	-0.200***	-0.162***	-0.163***	-0.163***
	(4.945)	(6.388)	(6.648)	(6.350)	(6.699)	(5.450)	(6.039)	(4.769)	(4.444)	(4.153)
ΔROA3	-0.086***	-0.074***	-0.079***	-0.082***	-0.077***	-0.057**	-0.047*	-0.071***	-0.083***	-0.101***
	(5.493)	(4.618)	(4.841)	(4.817)	(4.557)	(2.242)	(1.777)	(2.640)	(2.954)	(3.377)
ΔROA5	-0.070***	-0.090***	-0.081***	-0.093***	-0.110***	-0.018	-0.026	-0.013	-0.024	-0.015
	(3.651)	(4.848)	(4.481)	(4.455)	(4.854)	(1.018)	(1.460)	(0.641)	(1.056)	(0.612)
DIV	0.018	0.015	0.028	0.024	0.001	0.007	0.120	0.281	0.284	0.222
	(0.316)	(0.217)	(0.354)	(0.254)	(0.006)	(0.058)	(0.767)	(1.541)	(1.582)	(0.973)
OCF	-0.030	-0.141***	-0.199***	-0.219***	-0.244***	-0.070**	-0.122***	-0.154***	-0.182***	-0.243***
	(1.010)	(4.875)	(6.556)	(6.064)	(5.552)	(2.413)	(3.503)	(4.243)	(4.466)	(5.682)
ACC	-0.055	-0.160***	-0.232***	-0.257***	-0.278***	-0.043	-0.090*	-0.107**	-0.157***	-0.159**
	(1.584)	(4.364)	(6.287)	(6.213)	(6.103)	(1.018)	(1.883)	(2.025)	(2.646)	(2.373)
ACQ	0.000	-0.002	-0.003	-0.005*	-0.005	0.000	-0.004	-0.003	-0.005	-0.008
	(0.027)	(0.697)	(1.145)	(1.658)	(1.533)	(0.044)	(0.594)	(0.451)	(0.621)	(0.883)
SIZE	0.002**	0.002**	0.002**	0.003**	0.003*	0.005***	0.006***	0.008***	0.011***	0.014***
	(1.993)	(2.016)	(2.298)	(2.233)	(1.902)	(2.702)	(3.223)	(3.728)	(4.064)	(4.549)

TABLE 7 (Continued)

Std. errors cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,631	5,052	4,399	3,786	3,216	4,331	3,755	3,165	2,650	2,201
Adjusted R^2	0.230	0.323	0.374	0.407	0.448	0.107	0.159	0.149	0.178	0.208

This table presents results of estimating model (2) separately for partitions based on whether the firm's auditor provides substantial tax services to the firm (*APTS* = 1) or provides no tax services to the firm (*APTS* = 0). Substantial tax services are deemed provided if the cost of tax services obtained during year *t* from the external auditor exceeds the median of APTS fees in the sample. No APTS are deemed provided if Audit Analytics reports no value for the variable TAX_FEES. *t*-values are reported in parentheses; ***, **, and * denote significance levels at the 0.01, 0.05, and 0.10, respectively (two-tail). The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variable of interest, *ΔDISCVA,* is the residual from model (1) reported in Table 3. All variables are defined in the appendix. Continuous independent variables are winsorized at the 1st and 99th percentiles. Comparisons of the coefficients from Columns (1) through (5) with (6) through (10), respectively, indicate that the coefficients of ΔDISCVA are significantly different across the two levels of APTS; chi-square statistics indicate two-tail significance at p<0.10 for the comparison of (5) with (10) and p<0.05 for the other four comparisons.

TABLE 8
Descriptive Statistics for Entropy-Balanced Samples

Panel A: Audit Expert Sample

Independent Variable	Auditor is Audit Expert (*AUDEXP* = 1) Mean	Variance	Skewness	Auditor is Not Audit Expert (*AUDEXP* = 0) Mean	Variance	Skewness
ΔDISCVA	0.001	0.002	-1.851	0.001	0.005	0.570
RD	0.399	5.908	10.034	0.875	16.783	6.248
CAP	0.054	0.011	7.912	0.071	0.030	5.334
EP	-0.019	0.053	-4.710	-0.071	0.082	-3.513
BTM	0.480	0.208	1.728	0.524	0.302	1.652
ΔROA	0.007	0.020	0.486	0.011	0.043	0.547
ΔROA3	0.020	0.037	1.240	0.027	0.082	0.977
ΔROA5	0.025	0.048	1.936	0.046	0.127	1.684
DIV	0.011	0.000	3.473	0.008	0.001	4.290
OCF	0.065	0.024	-2.476	0.014	0.047	-1.872
ACC	-0.017	0.007	-1.246	-0.039	0.011	-0.951
ACQ	0.460	0.248	0.161	0.333	0.222	0.709
SIZE	6.913	3.982	-0.076	5.110	4.436	0.253

Panel B: APTS Sample

Independent Variable	Auditor Provides Substantial Tax Services (*APTS* = 1) Mean	Variance	Skewness	Auditor Provides No Tax Services (*APTS* = 0) Mean	Variance	Skewness
ΔDISCVA	0.001	0.001	0.327	0.001	0.005	0.740
RD	0.129	1.268	23.418	0.957	17.586	5.902
CAP	0.048	0.006	9.935	0.072	0.029	5.278
EP	0.008	0.038	-5.892	-0.085	0.089	-3.399
BTM	0.450	0.145	1.677	0.544	0.361	1.607
ΔROA	0.007	0.012	0.538	0.010	0.045	0.440
ΔROA3	0.023	0.025	1.717	0.017	0.079	0.808
ΔROA5	0.025	0.028	2.176	0.031	0.120	1.549
DIV	0.013	0.001	3.162	0.007	0.000	4.793
OCF	0.099	0.009	-2.238	-0.001	0.050	-1.705
ACC	-0.007	0.004	-0.768	-0.043	0.012	-0.948
ACQ	0.555	0.247	-0.222	0.303	0.211	0.859
SIZE	7.728	2.793	0.107	4.973	3.519	0.147

Panels A and B present descriptive statistics for entropy-balanced samples when the partitioning variables are *AUDEXP* and *APTS,* respectively. All variables are defined in Appendix A. Skewness is measured using the Pearson's moment coefficient of skewness.

TABLE 9

Analysis of Entropy-Balanced Samples to Examine the Influences of Expertise and APTS on the Power of Discretionary Changes in the VA to Predict Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

Panel A: The Influence of Auditor Expertise (*AUDEXP*) on the Association Between *ΔDISCVA* and Changes in Future Pretax ROA

Independent Variable	*ΔPTI1* (1)	*ΔPTI2* (2)	*ΔPTI3* (3)	*ΔPTI4* (4)	*ΔPTI5* (5)
AUDEXP	-0.001	-0.000	-0.001	-0.001	-0.001
	(0.390)	(0.075)	(0.298)	(0.405)	(0.308)
ΔDISCVA	-0.069	-0.051	-0.057	-0.073	-0.013
	(0.647)	(0.509)	(0.592)	(0.645)	(0.104)
*AUDEXP * ΔDISCVA*	-0.179	-0.235*	-0.228*	-0.246*	-0.316**
	(1.472)	(1.949)	(1.858)	(1.805)	(2.069)
Observations	15373	13611	11734	10021	8439
Adjusted R^2	0.193	0.252	0.271	0.301	0.321

Panel B: The Influence of APTS on the Association Between *ΔDISCVA* and Changes in Future Pretax ROA

Independent Variable	*ΔPTI1* (1)	*ΔPTI2* (2)	*ΔPTI3* (3)	*ΔPTI4* (4)	*ΔPTI5* (5)
APTS	-0.001	0.001	0.002	0.002	0.001
	(0.616)	(0.394)	(0.738)	(0.609)	(0.286)
ΔDISCVA	-0.199**	-0.242**	-0.267***	-0.290**	-0.293**
	(2.042)	(2.515)	(2.748)	(2.566)	(2.136)
*APTS *ΔDISCVA*	-0.161	-0.096	-0.028	-0.045	-0.000
	(1.311)	(0.806)	(0.233)	(0.326)	(0.003)
Observations	15373	13611	11734	10021	8439
Adjusted R^2	0.242	0.327	0.376	0.411	0.449

Results are presented for the estimation of model (2) augmented with *AUDEXP* (Panel A) and *APTS* (Panel B), *ΔDISCVA*, and interactions of these respective variables with *ΔDISCVA*. *t*-values are reported in parentheses; ***, ** and * denote significance levels at the 0.01, 0.05, and 0.10, respectively (two-tail). The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variables of interest are the interaction terms. All variables are defined in the appendix. Continuous independent variables are winsorized at the 1st and 99th percentiles. All controls from model (2) are included along with year and industry fixed effects. Standard errors are clustered by company.

TABLE 10
Analysis of the Effects of Auditor Attaining Industry Expertise (*AUDEXP)* on the Power of Discretionary Changes in the VA to Predict Changes in ROA from Year *t* to Average ROA for Five Periods Beginning with Year *t*+1 and Ending with Years *t*+1 through *t*+5

Panel A: Associations Between *ΔDISCVA* and Changes in Future Pretax ROA for *t*-2 and *t*-1 Before Audit Firms Obtain Industry Expertise

Independent Variable	*ΔPTI1* (1)	*ΔPTI2* (2)	*ΔPTI3* (3)	*ΔPTI4* (4)	*ΔPTI5* (5)
ΔDISCVA	0.378	0.250	0.403	0.262	-0.555
	(1.212)	(0.860)	(1.145)	(0.670)	(1.283)
Observations	219	219	194	162	131
Adjusted R^2	0.304	0.271	0.153	0.181	0.191

Panel B: Associations Between *ΔDISCVA* and Changes in Future Pretax ROA for *t*, *t*+1, and *t*+2 After Audit Firms Obtains Industry Expertise

Independent Variable	*ΔPTI1* (1)	*ΔPTI2* (2)	*ΔPTI3* (3)	*ΔPTI4* (4)	*ΔPTI5* (5)
ΔDISCVA	-0.491	-0.454	-0.858**	-0.664	-0.734*
	(1.642)	(1.427)	(2.359)	(1.432)	(1.758)
Observations	328	280	225	183	149
Adjusted R^2	0.207	0.286	0.283	0.362	0.505

Results are presented for the estimation of model (2) for two samples of companies that are clients of auditors that attain audit expertise. Panel A shows the predictive power of the change in discretionary VA two years prior to an auditor obtaining auditor expertise. Panel B shows the predictive power of the change in discretionary VA in the two years following the audit firm's qualification of audit expertise. ***, **, and * denote significance levels at the 0.01, 0.05, and 0.10, respectively (two-tail). The dependent variables, *ΔPTI1* to *ΔPTI5*, are the mean pretax return on average assets for the years *t*+1 to *t*+1 through *t*+5, respectively, less the pretax return on average assets for year *t*. The variable of interest is *ΔDISCVA,* which is the residual from model (1) reported in Table 3. All variables are defined in the appendix. Continuous independent variables are winsorized at the 1st and 99th percentiles. Controls from model (2), year fixed effects, and industry fixed effects are included. Standard errors are clustered by company.