

Auditor Choice and Debt Structure

ABSTRACT

In this paper, we examine the impact of a firm's debt structure including debt level, debt sources and maturity structure on its choice of large/specialist auditor. The objective is to analyze whether the efficient debt contracting or the managerial opportunism hypothesis better explains a firm's auditor choice decision, given the debt market's demand for higher-quality and more conservative audits. We find that firms with high leverage are less likely to have large/specialist auditors, which is consistent with the managerial opportunism hypothesis. Prior studies document that financial statements audited by large/specialist auditors are more conservative and have lower level of discretionary accruals. Because the likelihood and cost of covenant violation are high for firms with high leverage, they avoid large/specialist auditors to keep their financial reporting flexibility. We further investigate whether the negative relation between auditor choice and client leverage differs between firms with only private debt and firms that also have access to the public debt market. While it holds for the private debt sample, for the sample that includes public debt, the negative relation becomes a significantly positive relation when industry specialization is used to measure auditor choice. This reversal confirms the difference between the public and private debt markets in the monitoring function and covenant features. We also segregate the effect of short-term and long-term debt on auditor choice and find that the negative relation is more pronounced for short-term debt than for long-term debt. The findings hold after we control for the potential reciprocal causation between auditor choice and leverage using two-stage procedures.

Keywords: auditor choice, industry specialization, debt structure, debt sources, maturity structure

Data availability: All data used in this study are available from public sources

INTRODUCTION

The choice of auditor is a well researched area in the auditing literature. A number of studies identify the factors that affect a firm's auditor choice decision (Chow 1983; Francis and Wilson 1988; Johnson and Lys 1990; DeFond 1992; Francis et al. 1999; Lennox 2005; Godfrey and Hamilton 2005). Based on the general agency cost framework of Jensen and Meckling (1976), one stream of research models the choice of high-quality auditors as an increasing function of agency costs between shareholders and managers and between debt holders and managers/shareholders. Auditing is a mechanism to mitigate the agency conflict between a firm and its capital providers. There is more demand for higher quality auditors when the agency conflicts are more severe. Auditor quality in these papers is generally captured by auditor size or brand name reputation (Big N vs non-Big N¹). Leverage is the proxy for the agency conflict between debt holders and managers/shareholders along with other measures that are proxies for the agency conflict between shareholders and managers such as managerial ownership, diffusion of ownership and bonus-based performance contracts (Francis and Wilson 1988; DeFond 1992).

The results, however, are inconsistent. Francis and Wilson (1988) find a negative association between a firm's leverage change and its change to larger auditors and DeFond (1992) finds a positive relation². Since leverage is just one of a few measures of agency costs in these studies, the inconsistent results across the measures of agency costs and across the studies are not adequately unexplained.

Using larger and more recent samples, we provide a more comprehensive analysis of the impact of debt structure on a firm's auditor choice decision. Specifically, we explore three

¹ The auditing industry has experienced increased concentration in the past two decades. Big 8 has become Big 6, Big 5 and now Big 4. For brevity, these large accounting firms are referred to as Big N in this paper in contrast to non-Big N for the rest of the industry.

² DeFond (1992) summarizes the results of four other papers that include leverage in their auditor choice studies.

related research questions. First, built upon research developments in accounting, auditing and finance since these earlier studies, we re-examine the relation between leverage and auditor choice decision. The purpose is to test whether the relation has evolved and more importantly to identify which theory better explains the relation. Second, we analyze whether the relation varies with the sources of debt. Third, we test whether the relation differs between short-term and long-term debt. Auditor choice is captured along two dimensions: brand name reputation that is typically used in prior studies and industry specialization, an aspect that has drawn much attention in the auditing literature since these earlier studies.

Our predictions on the relation between auditor choice and leverage are based on two streams of literature that link firms' choice of accounting policies to the presence of accounting numbers in debt contracts. One is the efficient debt contracting role of conservatism and the other is the managerial opportunism hypothesis.

The efficient debt contracting role of conservatism argues that debt holders have asymmetric payoff structure and conservatism reflected in accounting numbers mitigates their downside risk. When the agency cost is high, managers will bond themselves to more conservative reporting and signal to the debt market that they are committed to protecting debt holders' interests. The auditor differentiation literature typically consider large or specialist auditors as being more conservative. So the efficient debt contracting hypothesis suggests that firms with high leverage are more likely to have Big N/industry specialist auditors who provide more conservative audits.

The managerial opportunism hypothesis, however, predicts the contrary. This line of research argues that there are costs with covenant violation such as increased interest and reduced line of credit. Recent empirical evidence from the corporate finance literature suggests

that covenant violation go can even affect a firm's investment activities and corporate governance (e.g. management turnover). Therefore, firms have strong incentives to use their financial reporting flexibility to avoid covenant violation. Being more conservative potentially increases earnings volatility and therefore increases the probability of covenant violation. Zhang (2008) also finds empirical support that being more conservative accelerates covenant violation. Because firms with high leverage are more likely to violate debt covenants and the costs of covenant violation are also higher, they are less likely to have more conservative Big N/industry specialist auditors. Since the efficient debt contracting role of conservatism and the managerial opportunism hypothesis give us contradictory predictions, we seek to identify which theory dominates the relation between auditor choice and leverage.

Our second research question explores whether the auditor choice and leverage relation varies with the sources of debt. This research question is motivated by the institutional differences between the public and private debt markets in monitoring functions and covenant features. Compared with public debt holders, private debt holders are argued to have better access to private information, better information processing ability, more efficient monitoring of debt contracts, more and tighter debt covenants. The differences in monitoring functions give rise to different demands from the public and private debt markets for more conservative auditing and the difference in demands consequently affects the benefits of choosing Big N/specialist auditors. The differences in covenant features give rise to different costs of covenant violation and hence the costs of having Big N/specialist auditors. Firms with only private debt are more concerned over covenant violation compared to those with access to the public debt market. They therefore have more incentives to avoid Big N/Specialist auditors.

Short-term debt and long-term debt also differ with respect to monitoring function and covenant features. Compared with long-term debt, short-term debt is largely held by banks that are monitoring specialists and contains more restrictive debt covenants (Park 2000). In the case of covenant violation, short-term debtholders give less concession (Berglof and Von Thadden 1994). Therefore, similar to the argument for public and private debt, firms with more short-term debt are more concerned over covenant violation and they have more incentives to avoid Big N/Specialist auditors.

Our samples include all firm-years on COMPUSTAT Industrial Annual from 1988 to 2006 with available data. Brand name reputation is measured with a dichotomous variable to indicate a Big N or a non-Big N. Following prior literature, we use an audit firm's industry market share for a given year as the proxy for industry specialization, which is a continuous variable. We use both level and change models to test the relation between auditor choice and leverage. Availability of S&P ratings in COMPUSTAT is used to segregate firms with only private debt from those that have both public and private debt.

We find consistent results that firms with high leverage are less likely to have Big N/industry specialist auditors and firms that change to higher leverage are less likely to change to Big N/industry specialist auditors. This negative relation is consistent with the managerial opportunism hypothesis. For firms with high leverage, the likelihood and cost of covenant violation increase. Since financial statements audited by large/specialist auditors are more conservative, firms audited by large or specialist auditors are forced to accelerate the recognition of bad news, which further increases the probability of covenant violation. Therefore, firms with high leverage have more incentives to avoid large/specialist auditors to retain their financial reporting flexibility.

To identify the differential impact of the public and private debt market on a firm's auditor choice decision, we run separate regressions for the sample that has only private debt and the sample that has both public and private debt. We find that the coefficient for leverage is significantly negative for the private debt sample. But the negative relation disappears for the sample that also has public debt and even turns positive when industry specialization is used as the measure of auditor choice. The reversal in the coefficient sign confirms the difference between the public and private debt markets in the monitoring functions and covenant features. Compared with the private debt market, the public debt market is weaker in monitoring the borrower and has to rely more on more conservative large/specialist auditors. As to the covenant features, the borrower of public debt is less concerned over violating debt covenants because there are fewer accounting-based covenants and the covenants are generally set looser in public debt.

As to the maturity structure, although the coefficients for short-term debt and long-term debt are both significantly negative while controlling for other factors that affect auditor choice, the negative relation is more pronounced for short-term debt.

Because recent studies provide empirical evidence that auditor choice affects a firm's cost of debt and target debt ratio (Chang et al. 2008; Pittman and Fortin 2004; Mansi et al. 2004), there is a potential reciprocal causation between auditor choice and leverage. To control the endogeneity problem, we apply two-stage probit least squares (2SPLS) to the brand name model and two-stage least squares (2SLS) to the industry specialization model to study the effect of leverage on auditor choice and any difference between the public and private debt samples. The results still hold after we control for the endogeneity problem using 2SPLS and 2SLS.

Our study extends the auditor differentiation and auditor choice literature. We provide empirical evidence that a firm's financial leverage is an important consideration in its choice of auditor and the consideration varies with debt sources and maturity structure.

Compared with the prior studies that also include leverage as one of their determinants for auditor choice, we focus specifically on the conflict of interests between managers/shareholders and debt holders and provide a detailed explanation for the negative relation. The theoretical bases go beyond the general discussion in Jensen and Meckling (1976) to incorporate developments in accounting literature on debt contracting including the efficient debt contracting role of conservatism and the managerial opportunism hypothesis. Furthermore, this paper differentiates the impact of different debt sources and maturity structure on a firm's auditor choice decision. This segregation provides critical insights because agency costs, monitoring effectiveness and covenant features vary considerably among different types of debt. In contrast, the debt component in leverage in earlier studies is considered as uniform.

We also make a few technical improvements. First, our tests are based on larger and more comprehensive samples. Because the auditing industry and the general business environment have changed dramatically over the past twenty years, we provide new insights using updated data. Secondly, we use both brand name reputation and industry specialization as our measures of auditor choice and find consistent results. Thirdly, we consider both "level" and "change" model specifications. The level specification, which in general establishes association between two variables, captures a firm's general auditor choice policy while the change specification is less prone to omitted variable problems. Finally, we take into consideration of the potential reciprocal causation between auditor choice and leverage and use two-stage procedures to control the endogeneity problem.

Our study also contributes to the growing number of literature on the impact of the debt market on firms' financial reporting attributes, especially conservatism. Auditing plays an important role in monitoring a firm's financial reporting system. It has significant impact on the financial flexibility a firm has in making accounting choices and the audited financial statements are a joint product of auditor-client negotiation when disagreements exist. Auditing has significant influence on its level of conservative reporting. So a study of the relation between auditor choice and debt structure provides additional insight.

The rest of the paper is organized as follows. Chapter 2 discusses the relevant literature and develops hypotheses. Chapter 3 presents the research designs, followed by a discussion of the results in chapter 4. Chapter 5 discusses a few additional tests. Chapter 6 concludes.

BACKGROUND LITERATURE AND HYPOTHESIS DEVELOPMENT

Auditing and the Debt Contracting Process

The role of auditing arises because of agency problems generated from the separation of management and control. There are two types of agency problems, one between managers and shareholders and another between managers/shareholders and debtholders (Jensen and Meckling 1976). We focus on the latter type of agency problems that managers/shareholders have incentives to choose investment, financing and dividend policies to the detriment of bondholders. Agency conflicts of this type can be in such forms as excessive dividend payment, claim dilution, asset substitution and underinvestment (Smith and Warner 1979; Watts and Zimmerman 1986). Debt contracts are thus seen as ways to mitigate agency conflicts.

Debt contracts typically contain affirmative and negative covenants to enhance debtholders' ability to monitor the lending. Debtholders can, for example, call a loan without penalty using a covenant violation. Affirmative covenants require borrowers to meet some basic

standards such as timely payments, accurate financial disclosure etc. Negative covenants restrain borrowers from taking certain actions including paying dividends, taking additional debt, maintaining working capital, undertaking mergers, selling assets and purchasing certain securities (Strahan 1999; Leftwich 1983). These restrictions are conditional on firms' financial positions that are typically measured in such accounting numbers as debt to EBITDA, interest coverage, tangible net worth and current ratio (Leftwich 1983; Dichev and Skinner 2002).

Because of the use of accounting numbers in debt covenants, auditing plays an important monitoring role in the debt contracting process. One commonly recognized function of auditing in mitigating the agency conflict between managers/shareholders and debtholders is that high-quality auditors deliver credibility to the financial accounting information used in debt covenants. Auditors attest to the accuracy of the accounting numbers used and insure that the procedures used to generate these numbers are in conformity with Generally Accepted Accounting Principles (GAAP).

Another important, yet less stressed role of external auditors in mitigating the agency conflict between managers/shareholders and debtholders is that auditor conservatism is in line with the debtholders' demand for conservatism. Conservatism is defined as asymmetric recognition of gains and losses. In studying the debt contracting process, conservatism deserves a separate discussion from the other attributes of accounting numbers because it potentially differentiates the demand for external auditing between debtholders and shareholders. Studies support debtholders' preference for conservatism, but it is unclear whether auditor conservatism is also beneficial to the equity market (DeFond and Francis 2005). Even if it is, auditor conservatism might be more beneficial to debtholders than to shareholders.

Auditor Differentiation

Auditors of different size differ in performing high-quality and conservative audits. Theoretical research suggests a positive relation between auditor size and auditor quality. The quality of audits depends on the competence and independence of auditors. Competence is manifested through the probability that the auditor discovers a given breach. Independence is shown through the probability that the auditor reports the discovered breach (DeAngelo 1981a, 1981b; Watts and Zimmerman 1986). Large auditors are generally more competent because of their economies of scale and industry-specific and technical expertise. Large auditors are more independent because: (1) relative financial independence enables them to stand up against clients' questionable reporting behaviors; (2) they have more quasi-rent to lose if they fail to deliver high-quality audits; (3) they are more concerned about protecting their investment in reputation capital; (4) litigation risk is higher for large auditors because of their "deeper pocket" (Dye 1993).

The positive relation between auditor size and audit quality is supported by many empirical auditor differentiation studies using various constructs such as discretionary accruals, management forecast errors, earnings response coefficients, the promptness of disclosing auditor changes and going-concern opinions (Becker et al. 1998; Francis et al. 1999; Davidson and Neu 1993; Teoh and Wong 1993; Schwartz and Soo 1996; Lennox 1999). In addition, consistent with the findings that Big N auditors provide higher-quality audits, the audit pricing literature indicates that Big N accounting firms earn systematically higher audit fees (Francis and Simon 1987; Craswell et al. 1995).

Another perspective of differentiating auditor is conservatism. Big N auditors are more conservative because they face higher litigation risk than non-Big N auditors due to their "deeper pockets". Both the explicit cost (e.g. monetary settlement) and implicit cost (e.g. reputation

damage) following lawsuits are higher for Big N auditors. Since a lawsuit is more likely to follow income overstatement than income understatement, Big N auditors would like managers to report losses more timely and delay the recognition of gains. In terms of empirical evidence, Francis and Krishnam (1999) find that Big N auditors are more conservative with firms with high-accruals, especially income-increasing accruals. Conservatism is measured by the likelihood of issuing modified audit reports. Kim et al. (2003) find that Big N auditors are more effective than non-Big N auditors in constraining income-increasing accruals, but less effective in constraining income-decreasing accruals. The stronger preference of Big N auditors for income understatement reflects their conservative bias. Using the asymmetric recognition of gains and losses as their measures of conservatism, Basu et al. (2000) find that firms audited by Big N auditors are quicker in recognizing unrealized losses than unrealized gains.

The arguments on differentiated audits for different size auditors have been extended to industry specialization. To segregate the effect of industry specialization from brand name reputation, the studies on industry specialization in these studies limit their samples to observations audited by Big N auditors. Financial statements audited by specialist auditors are found to have lower level of discretionary accruals (Krishnan 2003, Balsam et al. 2003), higher earnings response coefficient (Balsam et al. 2003), and enhanced disclosures (Dunn & Mayhew 2004). Similar to Basu et al. (2000), Krishnan (2005) use the asymmetric timeliness measure of conservatism and financial statements audited by specialist auditors are quicker in recognizing losses and therefore are more conservative.

There are, however, some controversies over auditor fee premium charged by industry specialist auditors. Craswell et al. (1995) find that industry specialist Big N auditors earn a 34% fee premium over nonspecialist Big N auditors. Ferguson and Stokes (2002), however, find very

limited support for the presence of industry specialist premium. They attribute the change to increased auditing industry concentration over the years.

Auditor Choice and Leverage

A few prior studies also include leverage as one determinant of auditor choice. DeFond (1992) uses leverage as one measure of agency conflicts along with managerial ownership and short-term accruals. He argues that the demand for high-quality audits is an increasing function of agency conflicts because auditing is a means of reducing agency costs. His results support a positive association between change in leverage and change to a high-quality auditor. Francis and Wilson (1988) include managerial ownership, the existence of incentive performance contracts, the diffusion of ownership and leverage in their test of the agency theory. Although they anticipate a positive relation between change to a Big Eight auditor and other agency cost variables, they predict a negative association between level and change of leverage and change to a Big Eight auditor based on the argument that leverage in their study is measured prior to auditor change. Their results about leverage are inconsistent: change to a Big Eight auditor is positively associated with change in leverage, but negatively associated with leverage level.

Johnson and Lys (1990) argue that auditor changes are results of changes in clients' financing, investing and operating characteristics, in contrast to changes in agency costs. Using leverage as a measure of financial risk, they find it negatively correlated with their relative auditor size variable. This is contrary to their hypothesis of a positive relation based on the argument that large accounting firms can better diversify related audit risk. Leverage is later discarded from their multivariate regression because of its high correlation with other variables of interest.

Thus, prior research that examines the relation between leverage and auditor choice produces mixed results not only for different theoretical arguments, but also within the same agency cost framework. Lack of focused discussion on the agency problem between debtholders and managers/shareholders leaves the conflicting results unexplained. In addition, none of these studies considers the impact of debt composition. In terms of theoretical frameworks, these studies do not consider the opposing effect of managerial opportunism. The sample size in these studies is small and the sample period is from 1973 to 1985. In terms of research design, these studies either do not use both level and change analyses, or the results for level and changes models are inconsistent. These studies also do not control for the potential endogeneity issues³.

We develop our hypotheses relating auditor choice to debt structure including financial leverage, the mix of private and public debt and the maturity structure based on two streams of literature that link firms' choice of accounting policies to the presence of accounting numbers in debt contracts. The efficient debt contracting theory focuses on the positive role of accounting in debt contracting. Specifically, recent studies focus on accounting conservatism as a mechanism to mitigate the downside risk faced by debtholders (Ahmed et al. 2002; Moerman 2008; Zhang 2008; Beatty et al. 2008). Conservative accounting leads to lower reported earnings and assets, which in turn reduces the likelihood of firms transferring wealth from debtholders when restrictive covenants are based on these income statement and balance sheet numbers (Ahmed et al. 2002). Conservatism also leads to numbers that are more verifiable so that lenders can make better lending and monitoring decisions (Watts 2003; Zhang 2008).

The managerial opportunism literature, on the other hand, focuses on the adverse effects of using accounting data in debt contracts. Specifically, this line of research relies on the

³ Recent studies find that the choice of Big N auditor is related to a firm's cost of debt (Pittman and Fortin 2004; Mansi et al. 2004) and target debt ratio (Chang et al. 2008). The potential reciprocal causation need to be addressed. More details are provided below.

condition that there are costs with covenant violation. Several studies find that the costs associated with covenant violations can be substantial including increased collateralization, increased interest rates and restricted borrowing (Beneish and Press 1993, Chen and Wei 1993; Sweeny 1994). Recent empirical evidence from the corporate finance literature suggests that the costs of covenant violation go beyond these direct costs to even affect a firm's investment and corporate governance (e.g. management turnover). Therefore, managers have strong incentives to maintain their financial reporting flexibility and to avoid covenant violation. The managerial opportunistic behaviors are empirically supported by prior studies (e.g. Sweeny 1994; DeFond and Jiambalvo 1994; Dichev and Skinner 2002). The strong conservatism enforced by Big N/specialist auditors potentially increases earnings volatility and therefore increases the probability of covenant violation. Zhang (2008) provides empirical support that being more conservative accelerated covenant violation.

In summary, these two streams of literature make opposing predictions on managerial reporting behaviors. The efficient contracting hypothesis takes the view that borrowers bond themselves to conservative reporting that defers recognition of gains, but recognize losses in a timely manner. The managerial opportunism hypothesis, on the other hand, predicts that borrowers do not want to report more conservatively and even engage in aggressive reporting to avoid covenant violations. Given the important monitoring role auditing has in the debt contracting process, we expect the opposing reporting incentives to have different impacts on firms' choice of auditors. Since Big N/industry specialist auditors are better at constraining managerial reporting flexibility and are more conservative. The efficient contracting theory predicts a positive relation between leverage and the choice of Big N/specialist auditors. That is, firms with high leverage are more likely to have Big N/industry specialist auditors and firms that

change to higher leverage are more likely to change to Big N auditors. The managerial opportunism hypothesis, however, suggests that firms with high leverage have more incentives to keep their reporting flexibility and therefore avoid Big N/industry specialist auditors because the likelihood and cost of covenant violation is high when the leverage is high. We seek to identify which hypothesis better explains the relation between auditor choice and leverage. We express the following hypotheses in alternative forms:

H1a: Firms with high leverage are more likely to have Big N auditors.

H1b: Firms with high leverage are more likely to have industry specialist auditors.

H1c: Big N audited firms with high (low) leverage are more (less) likely to have industry specialist auditors.

H1d: Non-Big N audited firms with high (low) leverage are more (less) likely to have industry specialist auditors.

H1e: Firms that increase leverage are more likely to change to Big N auditors.

Segregating the Effect of Public and Private Debt on Auditor Choice

The public and private debt markets differ in monitoring functions and covenant features. Private debtholders have better access to the borrower's private information. They are typically monitoring experts and have better information processing capacity. There are generally more accounting-based negative covenants in private debt contracts and the covenants are set tighter. Technical violation of private debt covenants is more prevalent. In contrast, the incentive to engage in monitoring is weak for diffuse creditors of public debt due to the "free rider" problem – the thinking that some investors might "free ride" on others' efforts (Strahan 1999). There are less accounting-based debt covenants in public debt and they are set looser. As a result, technical

violation of debt covenant is rare. Chen and Wei (1993) document that only four out of total 128 covenant violators are for public debt.

Due to their information and monitoring advantage, private debtholders are expected to have less demand for the monitoring of external auditors compared to the public debt market. On the supply side, since there are more accounting-based covenants in private debt and the covenants are set tighter, managers have more incentive to keep their reporting flexibility and choose non-Big N auditors when leverage is high. In contrast, because public debtholders rely more on audited financial statements and auditors to make their lending decisions and to enforce contracts, their demand for Big N auditors is high. Because for public debt, the possibility of violating debt covenants is low, firms have less incentive to avoid Big N for the purpose of avoiding covenant violation. We therefore have the following hypotheses:

H2a: firms with high leverage are less likely to have Big N auditors if they only have private debt.

H2b: firms with high leverage are more likely to have Big N auditors if they also have public debt.

H2c: firms with high leverage are less likely to have industry specialist auditors if they only have private debt.

H2d: firms with high leverage are more likely to have industry specialist auditors if they also have public debt.

Segregating the Effect of Short-term and Long-term Debt on Auditor Choice

Because short-term debt is largely held by banks that are monitoring specialists. The demand for Big N/industry specialist auditing is low for short-term debtholders. Because short-term debt also has more restrictive debt covenants and they give less concession, the incentive to

supply Big N/industry specialist auditing is low for borrowers. Therefore, similar to the argument for public and private debt, the efficient contracting hypothesis predicts that more short-term debt indicates less demand for Big Four auditors, while more long-term debt suggests more demand for Big N auditors for their monitoring effectiveness and high-quality audits. The debt covenant hypothesis predicts a negative relation between levels of short-term debt and the choice of Big N auditors because managers need more reporting flexibility due to tighter covenants in short-term debt.

H3a: firms with more short-term debt are less likely to have Big N auditors.

H3b: firms with more long-term debt are more likely to have Big N auditors.

H3c: firms with more short-term debt are less likely to have industry specialist auditors.

H3d: firms with more long-term debt are more likely to have industry specialist auditors.

RESEARCH DESIGN

Measures of Auditor Choice

Auditor choice is measured along two dimensions: brand name reputation as designated by Big N and non-Big N auditors and industry specialization. Brand name reputation is coded as a dichotomous variable (*Auditor*) that equals 1 if financial statements are audited by one of the Big N and 0 otherwise. Following prior literature (Craswell et al. 1995; Ferguson and Stokes 2002; Godfrey and Hamilton 2005), industry specialization (*Specialization*) is measured as an auditing firm's industry market share. To be specific, it is calculated as the market share of the firm's auditor in the firm's two-digit SIC industry.

$$Specialization = \frac{\sum_{j=1}^{J_{ikm}} Sales_{ijkm}}{\sum_{i=1}^{I_{km}} \sum_{j=1}^{J_{ikm}} Sales_{ijkm}}$$

We keep industry specialization as a continuous variable to avoid the ambiguity of arbitrarily using a cut-off point for dichotomous variable.

Auditor Choice and Leverage

We use both level and change models to test the relation between auditor choice and leverage. The level specification takes on the following form⁴:

$$\begin{aligned}
 \text{Auditor/Specialization} = & \alpha_0 + \alpha_1 \text{Leverage} + \alpha_2 \text{Size} + \alpha_3 \text{Fixed assets} + \alpha_4 \text{Cycle} + \alpha_5 \text{P-E} \\
 & \text{ratio} + \alpha_6 \text{Issue} + \alpha_7 \text{Loss} + \alpha_8 \text{Regulation} + \alpha_9 \text{R\&D} + \text{Industry} \\
 & + \text{Year} + \varepsilon
 \end{aligned} \tag{1}$$

A logistic regression is used for brand name reputation and an ordinary least square regression is used for industry specialization. The definitions of the variables are as follows. *Auditor* and *Specialization* are as previously defined. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm of total assets; *Fixed Assets* is gross property, plant and equipment (Compustat item #7) divided by total assets; *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30⁵; *P/E* is price/earnings ratio at fiscal year end; *Issue* refers to net new equity issues (Compustat item #108 - #115) during the year scaled by total assets; *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise; *Regulation* equals one if an observation is in a regulated

⁴ We omit subscripts t and i from equations for presentation simplicity.

⁵ Days' inventory = 365 (average beginning- and ending-of-period inventory (Compustat item #3)/cost of goods sold (Compustat item #41)) and days' accounts receivable = 365 (average of beginning- and ending-of-period accounts receivable (Compustat item #2) /sales (Compustat item #12))

industry and zero otherwise⁶. *R&D* is research and development expenses (Compustat item #46) scaled by total assets.

Based on prior research, the model includes several control variables that are found to be correlated with auditor choice. We include *Size* because large firms are more likely to choose large auditors due to their operational complexity and geographic diversification. We include *Fixed assets* and *Cycle* because Francis et al. (1999) find that firms with higher capital intensity and longer operating cycle (measurements of firms' propensities to generate accruals) are more likely to hire Big N auditors. *P-E ratio* is used to measure a firm's growth potential. Firms with growth opportunities are more likely to issue securities and thus have more incentives to use Big N auditors. We include the variable *Issue* to further control the effect of equity issuance on auditor choice. We control for *Loss* because Big N auditors are less willing to audit firms in financial distress due to litigation concern. We include *Regulation* because Francis et al. (1999) posit that regulation might induce demand for Big N auditors. We include *R&D* because Godfrey and Hamilton (2005) argue that R&D, their proxy for discretionary expenditure, increases agency cost and therefore increases the demand for Big N/Industry specialist auditors.

We also use a change specification to capture the relation between auditor choice and leverage. One advantage of using a change model is that it mitigates the correlated omitted variable problem. In the level analyses, the results can be biased if we omit variables that affect auditor choice but differ between firms. Assuming these omitted variables remain constant over time, a change model can reduce the impact of these correlated omitted variables because the difference from year to year for these variables is zero. Another reason of including a change

⁶ Following Francis et al. (1999), the following industries are considered as regulated: railroads (4011 and 4100), telephone communications (4812 and 4813), electric companies (4911), gas companies (4922, 4923 and 4924), personal credit (6141), insurance (6311).

model is that it directly measures the impact of temporal changes in leverage on changes in auditors. Since we measure changes in leverage using years prior to the specific year of auditor change, including the change model provides a necessary condition to infer a causal relation between auditor choice and financial leverage.

Our test of auditor change and change in leverage takes on the following logistic regression model:

$$\begin{aligned} \Delta Auditor = & \alpha_0 + \alpha_1 \Delta Leverage + \alpha_2 \Delta Growth + \alpha_3 \Delta Cash\ flow + \alpha_4 \Delta Issue + \alpha_5 \Delta Acquisition \\ & + \alpha_6 \Delta Times\ interest + \varepsilon \end{aligned} \quad (2)$$

Choice of control variables follows Johnson and Lys (1990). $\Delta Auditor$ takes on values of 1, or 0. If the change in auditor is from a non-Big N to a Big N auditor, $\Delta Auditor$ is coded as 1; if it is from a Big N to a non-Big N, $\Delta Auditor$ is 0. *Growth* is sales growth (Compustat item #12); *Cash flow* is operating cash flow (Compustat item #308) scaled by total assets; *Acquisition* is acquisition expenses (Compustat item #129) scaled by total assets; *Times interest* is the ratio of earnings from operations (Compustat item #13) and interest expenses (Compustat item #15). *Leverage* and *Issue* are as previously defined. Changes in leverage and in other control variables are measured as changes over the two years PRIOR TO the specific year in which auditor changes occur.

Segregating the Effect of Public and Private Debt on Auditor Choice

To further examine the different impact of private and public debt on a firm's auditor choice decision, we separate the full sample into private and public debt samples using the availability of S&P ratings, following Faulkender and Peterson (2006). If a firm does not have an S&P long-term or short-term debt rating for that year, we assume it has only private debt. This method of segregating public and private debt is also justified by Cantor and Packer (1997) who

report that " both agencies (S&P and Moody's) currently have a policy of rating ALL taxable corporate bonds publicly issued in the United States regardless of whether they have been asked by an issuer for a rating".

We estimate model (1) separately on the two subsamples. We expect a negative relation between auditor choice and leverage for the private debt sample and a positive relation for the subsample with both public and private debt.

Segregating the Effect of Short-term and Long-term Debt on Auditor Choice

To differentiate the impacts of short-term debt and long-term debt on auditor choice decision, we run the following model:

$$\begin{aligned}
 Auditor/IndSpec = & \alpha_0 + \alpha_1 Short Term + \alpha_2 Long Term + \alpha_3 Size + \alpha_4 Fixed Assets + \\
 & \alpha_5 Cycle + \alpha_6 P/E + \alpha_7 Issue + \alpha_8 Loss + \alpha_9 Regulated + \alpha_{10} R\&D + Industry \\
 & + Year + \varepsilon
 \end{aligned} \tag{3}$$

Leverage in this model is separated into two parts: *Short Term* is short-term debt divided by total assets and *Long Term* is long-term debt divided by total assets. We expect a negative relation between short-term debt and auditor choice variable, a positive relation between long term debt and auditor choice variable. The control variables are defined as in model (1).

Two Stage Procedures (2SPLS and 2SLS)

In this paper, we are interested in testing whether leverage is a determinant of managers' choice of auditors. However, Chang et al. (2008) argue that the choice of auditor is a determinant of leverage and auditor quality affects a firm's target debt ratio. Closely related studies are Pittman and Fortin (2004) and Mansi et al. (2004) who find that cost of debt is lower for firms with Big N auditors. This poses a challenge to our research design because there is a potential

reciprocal causation between leverage and auditor choice, that is, the existence of the following relations:

$$Auditor = f_1(Leverage, X_1, \varepsilon_1) \quad (4)$$

$$Leverage = f_2(Auditor, X_2, \varepsilon_2) \quad (5)$$

The reciprocal causation causes *Leverage* and *Auditor* to be correlated with ε_1 and ε_2 respectively, violating the standard assumptions of single OLS and Logit models including the independent distribution of the explanatory variables (Gujarati 2002). Two-stage least squares are generally used in estimating overidentified equations to control the simultaneity problem. In the first stage, the endogenous variable is regressed on all the predetermined variables in the whole system. The predicted value thus obtained is uncorrelated with the stochastic disturbance terms in each equation and serves as an instrument variable in the second stage to replace the endogenous variable in the original equation. In testing the impact of industry specialization, we use two-stage least squares where both the first and second stages are estimated with OLS regression. Because the test of brand name reputation involves a dichotomous variable, we adopt two-stage probit least squares where the first stage is estimated with OLS regression while the second stage uses probit regression. The CDSIMEQ statement in STATA is used to obtain estimates for the coefficients that are consistent and have corrected standard errors.

We specify models (4) and (5) as:

$$\begin{aligned} Auditor/Specialization = & \alpha_0 + \alpha_1Leverage + \alpha_2Size + \alpha_3Fixed\ assets + \alpha_4Cycle + \alpha_5P- \\ & E\ ratio + \alpha_6Issue + \alpha_7Loss + \alpha_8Regulation + \alpha_9R\&D + \\ & Industry + Year + \varepsilon \\ \\ Leverage = & \beta_0 + \beta_1Auditor/Specialization + \beta_2Size + \beta_3Fixed\ assets + \beta_4Tax\ shields + \\ & \beta_5Growth + \beta_6Manufacture + \beta_7Profitability + Industry + Year + \varepsilon \end{aligned}$$

The models for the two stages are specified as follows:

Stage 1:

$$\begin{aligned} \text{Leverage} = & \alpha_0 + \alpha_1 \text{Size} + \alpha_2 \text{Fixed assets} + \alpha_3 \text{Tax shields} + \alpha_4 \text{Growth} + \alpha_5 \text{Manufacture} + \\ & \alpha_6 \text{Profitability} + \alpha_7 \text{Cycle} + \alpha_8 \text{P-E ratio} + \alpha_9 \text{Issue} + \alpha_{10} \text{Loss} + \alpha_{11} \text{Regulation} \\ & + \alpha_{12} \text{R\&D} + \text{Industry} + \text{Year} + \varepsilon \end{aligned}$$

Stage 2:

$$\begin{aligned} \text{Auditor/Specialization} = & \alpha_0 + \alpha_1 \text{IVLeverage} + \alpha_2 \text{Size} + \alpha_3 \text{Fixed assets} + \alpha_4 \text{Cycle} + \alpha_5 \text{P-} \\ & \text{E ratio} + \alpha_6 \text{Issue} + \alpha_7 \text{Loss} + \alpha_8 \text{Regulation} + \alpha_9 \text{R\&D} + \text{Industry} \\ & + \text{Year} + \varepsilon \end{aligned}$$

The choice of determinants of *leverage* follows prior literature (Titman and Wessels 1988; Rajan and Zingales 1995; Hovakimian et al. 2001). *Tax shields* equals one if the sum of net operating loss carry forward (Compustat item #51) and investment tax credit (Compustat item #52) is positive and zero otherwise; *Growth* is sales growth (Compustat item #12); *Manufacture* is an indicator variable that equals one if the SIC code (DNUM) of an observation is between 3400 and 4000 (firms producing machines and equipment) and zero otherwise. *Profitability* is income before extraordinary income (Compustat item #34) divided by total assets. The other variables are as previously defined. We include *Tax shields* because tax deductions for depreciation and investment tax credits are substitutes for the tax benefits of debt financing and therefore firms with large non-debt tax shields have fewer debt. We include *Fixed Assets* because the risk of appropriation is lower when firms have more collaterals and therefore firms are more likely to have higher level of leverage. *R&D* measures the uniqueness of product and is expected to be negatively related to *Leverage* because the potential costs of bankruptcy imposed on the constituents are higher for firms that produce specialized products. *Expenditure*

is another measure of firms' growth because the agency problem between managers and debtholders is more severe for growth firms, so they are expected to be negatively related to leverage. We include *Profitability* because firms use internal funds for investment before raising capitals externally and therefore past returned earnings should be an important determinant of a firm's current debt ratio. Finally, we include *Industry Dummies* to control industry effect, where industry classification follows Fama-French approach (Fama and French 1997).

RESULTS

Auditor Choice and Leverage

We select our sample to examine the relation between auditor choice and leverage from COMPUSTAT Annual that covers the time horizon of 1988 to 2006. We again truncate observations falling into top and bottom 1 percent of continuous independent variables. There are 94,204 firm-years for the full sample, of which 19,066 observations have both public and private debt and 75,138 observations have private debt only.

Table 1 presents the simple statistics for variables used in the auditor choice and leverage models. For the full sample, 80 percent use Big N auditors and the mean industry market share is 16.5%. Firms on average have a leverage 0.25, P-E ratio 11.218, and operating cycle of 5.362. The total assets are on average \$1416 million, 52.1 percent are fixed assets. Net new equity issuance is 6 percent and R&D expenses are 4 percent of total assets. 36 percent of firm-year observations have losses. Comparison of the public and private debt samples suggests that almost 97 percent of public debt observations use Big N auditors and 75 percent of private debt observations use Big N auditors. The public debt sample also uses more of industry specialist auditors (22 percent vs 15 percent). They have higher leverage and have more fixed assets. The average P/E ratio of the public debt sample is higher, suggesting more growth. But the private

debt sample issues more equity (7.37 percent of total assets vs 0.48 percent of total assets for the public debt sample) and spends more on R&D (4.63 percent of total assets vs 1.35 percent of total assets for the public debt sample).

[Insert Table 1 here]

The Pearson correlation analysis presented in table 2 indicates a high level of correlation between choice of Big N auditors and choice of industry specialization (almost 50 percent). Therefore, in our studies, we also use two subsamples consisting of only Big N audited firm-years and non-Big N audited firm-years to identify the additional explanatory power of the industry specialization. The univariate analysis indicates a negative relation between auditor choice and leverage.

[Insert Table 2 here]

Table 3 presents the results of testing the impact of leverage on auditor choice. The multivariate analysis confirms a significantly negative relation between choice of Big N/industry specialist auditors and leverage. The coefficient on leverage is -0.766 (p-value < 0.0001) for the brand name regression and -0.0178 (p-value < 0.0001) for the industry specialization regression. Overall, the results show that it is less likely that a firm with high leverage will have a Big N/industry specialist auditor, which is consistent with the prediction of the managerial opportunism hypothesis. Because the likelihood and cost of violating debt covenants is higher for firms with higher leverage, they have more incentives to avoid Big N/industry specialist auditors.

[Insert Table 3 here]

Table 4 presents the results of year by year regressions and regressions by subperiod. The results confirm a strong negative relation between the choice of brand name auditors and leverage. The negative relation between auditor choice and leverage holds for all the years from

1988 to 2006 with the exception of 1994. The results for industry specialization are weaker. The negative coefficient is not significant for nine out of the nineteen years, with all nine years but one being before 1996. The results seem to indicate an increasing trend of earnings management over time. The increase of the negative association is further confirmed by the subperiod regressions. The coefficients for the periods of 1988 – 1997, 1998 – 2001 and 2002 – 2006 are -0.554, -0.722 and -0.801 respectively.

[Insert Table 4 here]

Table 3 also presents the results of testing the additional explanatory power of industry specialization. For firms that have Big N auditors, we do not find an association between the choice of industry specialist auditor and leverage. For firms with non-Big N auditors, we actually find a positive association between the choice of industry specialist auditor and leverage.

Table 5 presents the results of using a change model. The coefficient for $\Delta Leverage$ is significantly negative, indicating that it is less likely for a firm that changes to higher leverage to change to a Big N auditor, confirming the results in table 3 and table 4.

[Insert Table 5 here]

Segregating the Effect of Public and Private Debt on Auditor Choice

To test the different impact of public and private debt on the choice of auditor, we run the regression of auditor choice on leverage separately for the sample that has access to the public debt market and the sample that only has private debt. The results presented in table 6 are in general consistent with our predictions. For the sample with only private debt, the coefficients on leverage are significantly negative (-0.893 for the brand name measure and -0.025 for the industry specialization measure). For the sample that also has public debt, we find a significant positive relation when industry specialization is used as the measure of auditor choice. However,

we do not find any association between choice of brand name auditor and leverage. The opposite estimates between the public and private debt samples reflect difference in monitoring functions and covenant features between the public and private debt markets, as we discussed in section 3. Borrowers balance the cost and benefit of having Big N/industry specialist auditors in each type of debt structure and yield to the demand from the public debt market for Big N/industry specialist auditors, but avoid such auditors when they only have private debt.

[Insert Table 6 here]

Segregating the Effect of Short-term and Long-term Debt on Auditor Choice

Table 7 presents the results of segregating the effect of short-term and long-term debt on auditor choice. Although the coefficients for short-term debt and long-term debt are both significantly negative while controlling for other factors that affect auditor choice, the negative relation between leverage and auditor choice is more pronounced for short-term debt than for long-term debt. The coefficients for *Short Term* and *Long Term* are -1.1198 and -0.5699 respectively for the brand name model and -0.0309 and -0.0101 respectively for the industry specialization model.

[Insert Table 7 here]

Controlling Endogeneity with 2SPLS and 2SLS

Table 8 presents the results of testing the impact of leverage on firms' choice of auditor after controlling for endogeneity problem using two-stage probit least squares (for the brand name regression) and two-stage least squares (for the industry specialization regression). The results are generally consistent with the single equation results that firms with high leverage are less likely to have Big N/industry specialist auditors. For the industry specialist measure of auditor choice, when we apply two-stage least squares to the subsamples of Big-N audited firms

and non-Big N audited firms, we find a significantly positive relation. The Big N auditor picked by a firm with high leverage is more likely to be an industry specialist. A non-Big N audited firm with high leverage is also more likely to have an industry specialist non-Big N auditor.

[Insert Table 8 here]

Table 9 reports the results of segregating the effect of public and private debt on auditor choice after controlling endogeneity. The two-stage procedures confirm the results found with the single equation models. For the public debt sample, we find no association for the brand name measure of auditor choice and a significantly positive relation for the industry specialist measure of auditor choice. For the private debt sample, we find a significantly negative relation.

[Insert Table 9 here]

DISCUSSIONS AND SENSITIVITY ANALYSES

The Asymmetric Recognition of Gains and Losses and Auditor Differentiation

Various constructs have been used in the auditing literature to differentiate audit. Since part of our arguments is based on the efficient contracting role of unconditional conservatism defined as the asymmetric recognition of gains and losses, we test whether the asymmetry in gain and loss recognition is more pronounced for Big N/industry specialist auditors for our sample. We use Basu (1997) model of measuring conservatism augmented with our auditor choice variables.

$$\begin{aligned}
 \text{Earning} = & \alpha + \beta_1 \text{Return} + \beta_2 \text{Return} * \text{DR} + \beta_3 \text{DR} + \beta_4 \text{Auditor/Specialization} \\
 & + \beta_5 \text{Return} * \text{Auditor/Specialization} + \beta_6 \text{Return} * \text{DR} * \text{Auditor/Specialization} + \\
 & \beta_7 \text{DR} * \text{Auditor/Specialization} + \varepsilon
 \end{aligned} \tag{3}$$

Earning is earnings per share excluding extraordinary items (Compustat item #58) scaled by the close price per share (Compustat item #199) at the beginning of the fiscal year. *Return* is buy-and-hold fiscal year return. *DR* is an indicator variable that equals 1 if it is bad news (*Return*

is less than zero) and zero otherwise. We interact *Return* and *Return*DR* with our auditor choice variables to identify auditor differentiation in conservatism. β_1 represents the sensitivity of earnings to good news and is expected to be positive. β_2 captures the incremental response of earnings to bad news over good news. It is expected to be positive for conservative reporting. The corresponding measure after interaction with *Auditor/Specialization* is $\beta_2 + \beta_6$. If Big N/industry specialist auditors are indeed more conservative in reporting bad news, we expect β_6 to be significantly positive.

As shown in model 2 and model 3 of table 9, the coefficients for our focus variable, the interaction of *Return*DR *Auditor/Specialization*, are positive 0.139 for the band name and 0.272 for the industry specialist regression, both highly significant, consistent with the prediction that firms audited by Big N/industry specialist auditors report bad news more quickly. The result also holds for the sub-sample that has only Big N audited firm years. The timing is important because recognizing losses more quickly potentially accelerates the violation of debt covenants. In addition, the increased asymmetry in recognizing gains and losses increases earnings volatility, which potentially increases the possibility of covenant violation.

[Insert Table 10 here]

Cost of Debt and Auditor Choice

If debt holders indeed can benefit from the auditing service by Big N/industry specialist auditors, we expect them to reward firms with Big N/industry specialist auditors with lower cost of debt. Pittman and Fortin (2004) provide evidence that cost of debt is lower for young firms with Big N auditors. Mansi et al. (2004) provide evidence for a negative relation between auditor quality and cost of debt for the bond market. We extend their research to test whether this applies

to a more general sample and whether this applies to industry specialist auditors. We also examine whether the relation differs between public and private debt.

We follow the model in Pittman and Fortin (2004).

$$\begin{aligned}
 \text{Interest Rate} = & \alpha + \beta_1 \text{Auditor/IndSpec} + \beta_2 \text{Leverage} + \beta_3 \text{Prime Rate} + \beta_4 \text{Default} + \beta_5 \\
 & \text{Size} + \beta_6 \text{Fixed Assets} + \beta_7 \text{Neg Equity} + \beta_8 \text{Profitability} + \text{Industry} + \\
 & \text{Year} + \varepsilon
 \end{aligned}
 \tag{2}$$

Cost of debt (*Interest Rate*) is measured with interest expenses (Compustat item #15) divided by the average total debt. We follow Pittman and Fortin (2004) in selecting the control variables. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Prime Rate* is the average prime rate for the year; *Default* is the difference between the yield on BAA-rated corporate bonds and the yield on 10-year government bonds for the year; *Size* is the natural logarithm of total assets; *Fixed Assets* is gross property, plant and equipment (Compustat item #7) divided by total assets; *Neg Equity* indicates if the book value of common equity is negative; *Profitability* is income before extraordinary items (Compustat item #18) divided by total assets. *Industry* represents indicator variables coded following Fama-French industry classification (Fama and French 1997); *Year* are also indicator variables to control for year fixed effect. We expect a positive sign for *Leverage* and *Neg Equity* because high leverage and negative book value of equity indicates high credit risk. *Prime* and *Default* are proxies of the underlying cost of capital and the overall credit environment and are expected to positively related to cost of debt. *Size*, *Fixed Assets*, and *Profitability* are expected to have a negative relation with cost of debt. Larger and profitable firms on average have the ability to generate more cash flow and serve their debt. High fixed assets indicate high collateral value and in turn reduce a firm's cost of debt.

Table 11 presents the results of testing whether firms with Big N/Specialist auditors are rewarded with lower cost of debt. Our results strongly support the hypothesis. The coefficients for *Auditor* and *Specialization* are significantly negative using either brand name or industry specialist as measure of auditor choice. Comparison of public debt and private debt samples suggests not only the public debt market cares about the choice of Big N/industry specialist auditors, so does the private debt market. The coefficients for the control variables of *Size*, *Fixed Assets*, *Neg Equity* and *Profitability* are consistent with the prediction. The exception is *leverage*, which, against intuition and findings in some prior literature that use yield and debt spread to measure cost of debt (Sengupta 1998 and Bharath et al. 2008), is found to be negatively related to cost of debt Francis et al. 2005 also find a negative relation using the same realized interest rate as their measure of cost of debt. They attribute the finding to the noisiness of using this measure of cost of debt.

[Insert Table 11 here]

The Size Effect

GAO 2003 Report on Consolidation and Competition of Public Accounting Firms documents that large firms complain about their limited auditor choices because they are expected to use Big N auditors due to their operational complexity and geographic dispersion. Sometimes conflict of interests reduces their choices even further. We take a closer look at the effect of client size on the relation between auditor choice and leverage and the results are presented in table 10. The negative relation between auditor choice and leverage is the strongest among small companies who have more flexibility in making their auditor choice decision. The significant negative relation disappears for firms of top 25% in size.

[Insert Table 12 here]

Industry-adjusted Leverage

Because leverage has been argued to vary considerably across industries (Aggarwal and Zhao 2007), we further control the industry effect by using an industry-adjusted leverage measured as the difference between a firm's leverage and the industry median. The results are presented in table 13. The negative relation holds between leverage and auditor choice holds.

[Insert Table 13 here]

CONCLUSION

In this paper, we examine the impact of a firm's debt structure on its auditor choice decision. We find that financial leverage is negatively associated with the likelihood of having a Big N auditor, which suggests a dominant role of the managerial opportunism hypothesis over the efficient debt contracting hypothesis. We further find that this negative relation is mainly driven by observations that only have private debt. For the sample that has both public and private debt, the auditor choice and leverage relation becomes positive when industry specialization is used. The differential impact of public and private debt on auditor choice reflects the institutional differences in monitoring function and covenant features between the two types of debt.

Compared with prior related studies, our paper uses an updated and more comprehensive sample. We use both level and change models and we control endogeneity with the two-stage procedures. Our development of hypotheses is based on the recent theoretical and empirical progresses in the debt contracting explanation of conservatism and the managerial opportunism hypothesis. We also segregate the impact of different types of debt on auditor choice, because

the distinction between public and private debt in covenant features and monitoring functions has long been recognized in the finance literature.

To further understand the demand from the debt market for the auditing service and the response from borrowers in supplying such service, we propose a few future topics of interest. First, we can use the probability of covenant violation as a measure of auditor quality and test whether firms audited by Big N/industry specialist auditors are more likely to violate debt covenants following severe economic shocks. Violation of debt covenants has direct bearing on the interest of debtholders. Secondly, we can have more detailed analysis of how auditor choice affects the pricing and non-pricing terms of public and private debt contracts. Thirdly, auditor choice in terms of brand name in this paper is a dichotomous variable. Given the recent debates on the improved audit quality for the second tier (national) firms, we can refine the coding to have three levels: international, national and local accounting firms. Lastly, we can refine the change model to differentiate the implication of auditor resignation and auditor dismissal.

REFERENCE

- Ahmed, A., B. Billings, R. Morton, and M. Stanford-Harris. 2002. The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and reducing debt costs. *The Accounting Review* 77 (4): 867-890.
- Balsam, S., J. Krishnan, and Y. S. Yang. 2003. Auditor industry specialization and earnings quality. *Auditing: a Journal of Practice & Theory* 22 (2): 71-97.
- Basu, S. 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24: 3-37.
- , L. Hwang, and C. Jan. 2000. Differences in conservatism between Big Eight and non-Big Eight auditors. Working paper.
- Beatty, A., J. Weber, and J. Yu. 2008. Conservatism and debt. *Journal of Accounting and Economics* 45 (2-3): 154 - 174.
- Becker C. L., M. L. Defond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1-24.
- Beneish, M. D., and E. Press. 1993. Costs of technical violation of accounting-based debt covenants. *The Accounting Review* 68 (2): 233 – 257.
- Cantor, R., and F. Packer. 1997. Differences of opinion and selection bias in the credit rating industry. *Journal of Banking and Finance* 21: 1395 – 1417.

- Chang, X., S. Dasgupta, and G. Hilary. 2008. The effect of auditor quality on financing decisions. Working paper.
- Chen, K. C. W., and K. C. J. Wei. 1993. Creditors' decisions to waive violations of accounting-based debt covenants. *The Accounting Review* 68 (2): 218 – 232.
- Craswell, A. T., J. R. Francis, and S. L. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (3): 297-322.
- Davidson, R. A. and D. Neu. 1993. A note on the association between audit firm size and audit quality. *Contemporary Accounting Research* 9 (2): 479-488.
- DeAngelo, L. 1981a. Auditor independence, “low balling” and disclosure regulation. *Journal of Accounting and Economics* 3: 113 - 127.
- . 1981b. Auditor size and audit quality. *Journal of Accounting and Economics* 3: 183 - 199.
- DeFond, M. L. 1992. The association between changes in client firm agency cost and auditor switching. *Auditing: A Journal of Practice & Theory* 11 (1): 16-31.
- , and J. Jiambalvo, 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17: 145-176.
- , and J. R. Francis, 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice & Theory* 24 (supplement): 5-30.
- , and K. R. Subramanyam, 1998. Auditor changes and discretionary accruals. *Journal of Accounting and Economics* 25 (1): 35-67.
- Dichev, I. D., and D. J. Skinner, 2002. Large-sample evidence on the debt covenant hypothesis. *Journal of Accounting Research* 40 (4): 1091-1123.
- Dunn, K. A., and B. W. Mayhew, 2004. Audit firm industry specialization and client disclosure quality. *Review of Accounting Studies* 9: 35-58.
- Dye, R. A. 1993. Auditing standards, legal liability, and auditor wealth. *The Journal of Political Economy* 101 (5): 887-914.
- Fama, E. F. and K. R. French. 1997. Industry cost of equity. *Journal of Financial Economics* 43 (2): 153-193.
- Faulkender, M., and M. A. Petersen. 2006. Does the source of capital affect capital structure? *Review of Financial Studies* 19 (1): 45-79.

- Ferguson, A., and D. Stokes. 2002. Brand name audit pricing, industry specialization, and leadership premium post-Big 8 and Big 6 mergers. *Contemporary Accounting Research* 19 (1): 77-110.
- Fortin, S., and J. A. Pittman. 2007. The role of auditor choice in debt pricing in private firms. *Contemporary Accounting Research* 24 (3): 859 – 896.
- Francis, J.R., and D. T. Simon. 1987. A test of audit pricing in the small-client segment of the U.S. audit market. *The Accounting Review* LXII(1):145-157.
- , and E. R. Wilson. 1988. Auditor changes: a joint test of theories relating to agency costs and auditor differentiation. *The Accounting Review* LXIII(4):663-682.
- , and J. Krishnan. 1999. Accounting Accruals and Auditor Reporting Conservatism. *Contemporary Accounting Research* 16 (1): 135-165.
- , 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 and Theory* 18 (2): 17-34.
- Godfrey, J. M. and J. Hamilton. 2005. The impact of R&D intensity on demand for specialist auditor services. *Contemporary Accounting Research* 22 (1): 55 – 93.
- Gujarati, D. 2002. Basic econometrics 4th edition. McGraw-Hill/Irwin, New York, NY.
- Jensen, M. C., and W. H. Meckling. 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*: 305-360.
- Johnson, W. B., and T. Lys. 1990. The market for audit services: evidence from voluntary auditor changes. *Journal of Accounting and Economics* 12 (1-3): 281-308.
- Kim, J., R. Chung, and M. Firth. 2003. Auditor Conservatism, Asymmetric Monitoring, and Earnings Management. *Contemporary Accounting Research* 20 (2): 323-359.
- Khurana, I. K. and K. K. Raman. 2004. Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: evidence from Anglo-American countries. *The Accounting Review* 79 (2): 473-495.
- Krishnan, G. V. 2003. Does Big 6 auditor industry expertise constrain earnings management? *The Accounting Horizon* (Supplement): 1-16.
- . 2005. The association between Big 6 auditor industry expertise and the asymmetric timeliness of earnings. *Journal of Accounting, Auditing and Finance* 20 (3): 209-228.
- Leftwich, R.. 1983. Accounting information in private markets: evidence from private lending agreements. *The Accounting Review* LVIII (1): 23 – 41.

- Lennox, C. 1999. Are large auditors more accurate than small auditors? *Accounting and Business Research* 29 (3): 217-227.
- Mansi, S. A., W. F. Maxwell, and D. P. Miller. 2004. Does auditor quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research* 42 (4): 755 – 793.
- Moerman, R. 2008. The role of information asymmetry and financial reporting quality in debt contracting: evidence from the secondary loan market. *Journal of Accounting and Economics* 46: 240-260.
- Palmose, Z. 1986. The effect of nonaudit services on the pricing of audit services: further evidence. *Journal of Accounting Research* 24 (2): 405-411.
- Pittman, J. A., and S. Fortin. 2004. Auditor choice and the cost of debt capital for newly public firms. *Journal of Accounting and Economics* 37: 113 - 136.
- Schwartz, K. B. and B. S. Soo. 1996. Evidence of regulatory noncompliance with SEC disclosure rules on auditor changes. *The Accounting Review* 71 (4): 555 - 572.
- Smith, C. W. Jr., and J. B. Warner. 1979. On financial contracting. *Journal of Financial Economics* 7: 117-161.
- Strahan, P. E. 1999. Borrower risk and the price and nonprice terms of bank loans. Working paper. Federal Reserve Bank of New York.
- Sweeney, A. P. 1994. Debt-covenant violations and managers' accounting responses. *Journal of Accounting and Economics* 17: 281-308.
- Teoh, S. H. and T. J. Wong. 1993. Perceived auditor quality and the earnings response coefficient. *The Accounting Review* 68 (2): 346-366.
- Titman, S., and R. Wessels. 1988. The determinants of capital structure choice. *The Journal of Finance* 43(1): 1-19.
- United States General Accounting Office. 2003. Public accounting firms: mandated study on consolidation and competition.
- Watts, R., and J. Zimmerman. 1986. *Positive Accounting Theory*. Prentice Hall, Englewood Cliffs, NJ.
- . 2003. Conservatism in Accounting Part 1: explanations and implications. *The Accounting Horizon* 17 (3): 207-221.
- . 2003. Conservatism in Accounting Part 2: evidence and research opportunities. *The Accounting Horizon* 17 (4): 287-301.

Zhang, J. 2008. Efficiency gains from accounting conservatism: benefits to lenders and borrowers. *Journal of Accounting and Economics* 45: 27-54.

TABLE 1
Descriptive Statistics

Variable	Full Sample			Public Debt			Private Debt		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
<i>Auditor</i>	0.802	1.000	0.398	0.968	1.000	0.176	0.760	1.000	0.427
<i>Specialization</i>	0.165	0.132	0.141	0.228	0.204	0.145	0.149	0.119	0.136
<i>Leverage</i>	0.254	0.210	0.261	0.353	0.329	0.207	0.229	0.162	0.267
<i>Size</i>	1416	117	4748	5352	2045	8702	417	64	2029
<i>Fixed assets</i>	0.521	0.430	0.399	0.656	0.618	0.406	0.487	0.390	0.390
<i>Cycle</i>	5.362	3.823	6.872	4.445	3.341	5.348	5.595	3.974	7.189
<i>P-E ratio</i>	11.218	10.872	33.484	14.822	14.458	31.296	10.303	9.375	33.957
<i>Issue</i>	0.060	0.001	0.182	0.005	0.000	0.058	0.074	0.001	0.199
<i>Loss</i>	0.359	0.000	0.480	0.218	0.000	0.413	0.395	0.000	0.489
<i>Regulation</i>	0.049	0.000	0.215	0.120	0.000	0.325	0.031	0.000	0.172
<i>R&D</i>	0.040	0.000	0.086	0.014	0.000	0.033	0.046	0.000	0.094

The samples cover the time horizon of 1988 to 2006. There are 94,204 observations in the full sample. The public debt sample has 19,066 observations and the private debt sample has 75,138 observations.

Auditor is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. *R&D* is the research and development expense (Compustat item #46) scaled by total assets.

TABLE 2
Pearson Correlation Matrix

<i>Variables</i>	<i>Auditor</i>	<i>Special- ization</i>	<i>Lever- age</i>	<i>Size</i>	<i>Fixed Assets</i>	<i>Cycle</i>	<i>P-E ratio</i>	<i>Issue</i>	<i>Loss</i>	<i>Regul- ation</i>	<i>R&D</i>
<i>Auditor</i>	1										
<i>Specialization</i>	0.492*	1									
<i>Leverage</i>	-0.067*	-0.010*	1								
<i>Size</i>	0.123*	0.183*	0.038*	1							
<i>Fixed assets</i>	0.044*	0.069*	0.205*	0.098*	1						
<i>Cycle</i>	-0.064*	-0.058*	0.032*	-0.007*	-0.220*	1					
<i>P-E ratio</i>	0.078*	0.051*	-0.072*	0.051*	0.002	-0.037*	1				
<i>Issue</i>	-0.082*	-0.073*	-0.100*	-0.099*	-0.156*	0.027*	-0.079*	1			
<i>Loss</i>	-0.161*	-0.115*	0.161*	-0.129*	-0.038*	0.078*	-0.523*	0.224*	1		
<i>Regulation</i>	0.040*	0.066*	0.108*	0.180*	0.184*	-0.031*	-0.001	-0.030*	-0.045*	1	
<i>R&D</i>	0.003	-0.034*	-0.148*	-0.076*	-0.141*	0.060*	-0.086*	0.214*	0.256*	-0.098*	1

This table presents the Pearson correlation matrix for the full sample that has 94,204 observations covering the time horizon of 1988 to 2006.

* indicates significance at the 0.01 level or better.

Auditor is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. *R&D* is the research and development expense (Compustat item #46) scaled by total assets.

TABLE 3
Auditor Choice and Leverage: Pooled Regressions

Variables	Pred. Sign	Brand Name	Industry Specialist	Industry Specialist Big-N audited firm- years	Industry Specialist non- Big N audited firm - years
<i>Intercept</i>	?	-3.846 (0.00)	0.038 (0.00)	0.189 (0.00)	-0.014 (0.00)
<i>Leverage</i>	?	-0.766 (0.00)	-0.018 (0.00)	-0.001 (0.75)	0.003 (0.02)
<i>Size</i>	+	0.845 (0.00)	0.023 (0.00)	0.008 (0.00)	0.004 (0.00)
<i>Fixed assets</i>	+	0.216 (0.00)	0.004 (0.01)	0.001 (0.56)	0.009 (0.00)
<i>Cycle</i>	+	-0.013 (0.00)	0.000 (0.00)	0.000 (0.68)	0.000 (0.00)
<i>P-E ratio</i>	+	0.001 (0.00)	0.000 (0.29)	0.000 (0.98)	0.000 (0.01)
<i>Issue</i>	+	0.080 (0.13)	0.010 (0.00)	0.010 (0.00)	0.007 (0.00)
<i>Loss</i>	-	0.150 (0.00)	0.000 (0.83)	0.000 (0.94)	-0.001 (0.18)
<i>Regulation</i>	+	-0.525 (0.00)	0.002 (0.44)	0.009 (0.00)	0.044 (0.00)
<i>R&D</i>	+	4.027 (0.00)	0.101 (0.00)	0.023 (0.00)	0.009 (0.09)

This table presents the results of testing the impact of leverage on firms' choice of auditor. The full sample has 94,204 observations, among which 75,563 are audited by the Big N and 18,641 are audited by non-Big N auditors. The samples cover the time horizon of 1988 to 2006. A logistic regression is used for the brand name test and an ordinary least square regression is used for the industry specialist regression.

The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm transformation of total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. We also control for year and industry fixed effects.

P-values are reported in parentheses.

TABLE 4
Auditor Choice and Leverage: by Year and Period

Panel A: By year			
Year	No. of Obs	Brand Name	Industry Specialist
1988	4,056	-0.798 (0.00)	-0.020 (0.06)
1989	4,172	-0.762 (0.00)	-0.010 (0.32)
1990	4,154	-0.633 (0.00)	-0.010 (0.32)
1991	4,286	-0.717 (0.00)	0.003 (0.77)
1992	4,518	-0.431 (0.06)	-0.005 (0.66)
1993	4,843	-0.417 (0.08)	0.003 (0.80)
1994	5,157	-0.240 (0.34)	-0.004 (0.72)
1995	5,638	-0.579 (0.01)	-0.004 (0.63)
1996	5,880	-0.744 (0.00)	-0.008 (0.33)
1997	5,909	-0.811 (0.00)	-0.013 (0.08)
1998	5,777	-0.884 (0.00)	-0.018 (0.02)
1999	5,767	-0.714 (0.00)	-0.010 (0.17)
2000	5,773	-0.560 (0.00)	-0.011 (0.09)
2001	5,419	-0.735 (0.00)	-0.018 (0.00)
2002	5,150	-0.806 (0.00)	-0.016 (0.01)
2003	4,831	-1.110 (0.00)	-0.013 (0.03)
2004	4,743	-1.161 (0.00)	-0.019 (0.00)
2005	4,584	-0.756 (0.00)	-0.013 (0.05)
2006	3,547	-1.006 (0.00)	-0.033 (0.00)
Fama-Macbeth		-0.730 (0.00)	-0.012 (0.00)
Panel B: By period			
1988 - 1992	21,186	-0.646 (0.00)	-0.010 (0.04)
1993 - 1997	27,427	-0.620 (0.00)	-0.007 (0.07)
1998 - 2002	27,886	-0.731 (0.00)	-0.017 (0.00)
2003 - 2006	17,705	-0.909 (0.00)	-0.015 (0.00)
Panel C: By changes in the auditing industry			
1988-1997 Big 6	48,613	-0.554 (0.00)	-0.008 (0.00)
1998-2001 Big 5	23,047	-0.722 (0.00)	-0.016 (0.00)
2002-2006 Big 4	23,118	-0.801 (0.00)	-0.015 (0.00)

This table presents the results of testing the impact of leverage on firms' choice of auditor by year and period. The samples cover the time horizon of 1988 to 2006. A logistic regression is used for the brand name test and an ordinary least square regression is used for the industry specialist regression.

The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item

#6). *Size* is the natural logarithm transformation of total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. We also control for industry fixed effects, where Fama-French industry classification is used. P-values are reported in parentheses.

TABLE 5

Auditor Change and Leverage Change

From non-Big N to Big N	730
From Big N to non-Big N	1,454
Variables	Brand Name
<i>Intercept</i>	-0.676 (0.00)
<i>ΔLeverage</i>	-0.798 (0.01)
<i>ΔGrowth</i>	0.001 (0.92)
<i>ΔCash flow</i>	-0.090 (0.67)
<i>ΔIssue</i>	0.279 (0.22)
<i>ΔAcquisition</i>	1.322 (0.03)
<i>ΔTimes interest</i>	0.000 (0.59)

This table presents the results of using a change model to test the auditor choice and leverage relation.

The sample covers the time horizon of 1988 to 2006. A logistic regression is used.

The dependent variable is Δ Auditor, taking on values of 1 or 0. If the change in auditor is from a non-Big N to a Big N, then Δ Auditor is coded as 1; if it is from a Big N to a non-Big N, then Δ Auditor is coded as 0. Leverage is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). Growth is sales (Compustat item #34) growth. Cash flow is the net cash flow from operating activities (Compustat item #34) divided by total assets. Issue is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. Acquisition is acquisitions (Compustat item #129) divided by total assets. Times interest is operating income before depreciation (Compustat item #13) divided by interest expenses (Compustat item #15). Changes in leverage and in other control variables are measured over the two years PRIOR TO the year of auditor change.

P-values are reported in parentheses.

TABLE 6
Segregating the Effects of Public and Private Debt on Auditor Choice

Variables	Pred. Sign	Private Debt		Public Debt	
		Brand Name	Industry Specialist	Brand Name	Industry Specialist
<i>Intercept</i>	?	-4.032 (0.00)	0.020 (0.00)	0.418 (0.42)	0.090 (0.00)
<i>Leverage</i>	?	-0.893 (0.00)	-0.025 (0.00)	0.058 (0.79)	0.020 (0.00)
<i>Size</i>	+	0.859 (0.00)	0.024 (0.00)	0.440 (0.00)	0.017 (0.00)
<i>Fixed assets</i>	+	0.249 (0.00)	0.004 (0.01)	0.205 (0.18)	0.014 (0.00)
<i>Cycle</i>	+	-0.012 (0.00)	0.000 (0.00)	-0.034 (0.00)	-0.001 (0.00)
<i>P-E ratio</i>	+	0.001 (0.01)	0.000 (0.45)	0.004 (0.02)	0.000 (0.30)
<i>Issue</i>	+	0.072 (0.18)	0.009 (0.00)	0.215 (0.75)	0.016 (0.35)
<i>Loss</i>	-	0.161 (0.00)	0.001 (0.32)	-0.052 (0.67)	-0.002 (0.44)
<i>Regulation</i>	+	-0.417 (0.00)	0.011 (0.00)	-0.376 (0.01)	-0.009 (0.03)
<i>R&D</i>	+	4.123 (0.00)	0.104 (0.00)	5.243 (0.03)	-0.050 (0.23)

This table presents the results of testing whether the impact of leverage on firms' choice of auditor differs between firms that have access to the public debt market (with S&P ratings available) and firms that only have private debt (without S&P ratings). The public debt sample has 19,066 observations and the private debt sample has 75,138 observations. The samples cover the time horizon of 1988 to 2006. A logistic regression is used for the brand name test and an ordinary least square regression is used for the industry specialist regression.

The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm transformation of total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. We also control for year and industry fixed effects.

P-values are reported in parentheses.

TABLE 7

Segregating the Effects of Short-term and Long-term Debt on Auditor Choice

Variables	Pred. Sign	Brand Name	Industry Specialist
<i>Intercept</i>	?	-3.8220 (<.0001)	0.0385 (<.0001)
<i>Short Term</i>	?	-1.1198 (<.0001)	-0.0309 (<.0001)
<i>Long Term</i>	?	-0.5699 (<.0001)	-0.0101 (<.0001)
<i>Size</i>	+	0.8358 (<.0001)	0.0226 (<.0001)
<i>Fixed assets</i>	+	0.2056 (<.0001)	0.0033 (0.0174)
<i>Cycle</i>	+	-0.0130 (<.0001)	-0.0004 (<.0001)
<i>P-E ratio</i>	+	0.0013 (0.0004)	0.0000 (0.2317)
<i>Issue</i>	+	0.0712 (0.1724)	0.0100 (<.0001)
<i>Loss</i>	-	0.1643 (<.0001)	0.0005 (0.6700)
<i>Regulated</i>	+	-0.5256 (<.0001)	0.0023 (0.3916)
<i>R&D</i>	+	4.0134 (<.0001)	0.1004 (<.0001)

This table presents the results of testing whether the impact of leverage on firms' choice of auditor differs between short-term and long-term debt. Auditor choice is measured along two dimensions: brand name reputation (Big N vs non-Big N) and industry specialization. The samples cover the time horizon of 1988 to 2006. A logistic regression is used for the brand name test and an ordinary least square regression is used for the industry specialist regression.

The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Short term* is short-term debt (Compustat item #34) divided by total assets (Compustat item #6). *Long term* is long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm of total assets (Compustat item #6) in the regressions and total assets (Compustat item #6) in the descriptive statistics. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one a firm is a member of regulated industries and zero otherwise. We also control for the year and industry fixed effects.

P-values are reported in parentheses.

TABLE 8

Auditor Choice and Leverage: Control for Endogeneity Using 2SPLS and 2SLS

Panel A: Full sample

Variables	Brand Name		Industry Specialist	
	Probit	2SPLS	OLS	2SLS
<i>Intercept</i>	-1.975 (0.00)	-1.962 (0.00)	0.038 (0.00)	0.038 (0.00)
<i>Leverage</i>	-0.344 (0.00)		-0.015 (0.00)	
<i>IVLeverage</i>		-0.319 (0.00)		-0.014 (0.02)
<i>Size</i>	0.437 (0.00)	0.434 (0.00)	0.023 (0.00)	0.023 (0.00)
<i>Fixed assets</i>	0.093 (0.00)	0.087 (0.00)	0.004 (0.00)	0.004 (0.01)
<i>Cycle</i>	-0.006 (0.00)	-0.006 (0.00)	0.000 (0.00)	0.000 (0.00)
<i>P-E ratio</i>	0.001 (0.00)	0.001 (0.00)	0.000 (0.40)	0.000 (0.42)
<i>Issue</i>	0.045 (0.12)	0.050 (0.05)	0.010 (0.00)	0.010 (0.00)
<i>Loss</i>	0.058 (0.00)	0.056 (0.00)	0.000 (0.69)	-0.001 (0.66)
<i>Regulation</i>	-0.289 (0.00)	-0.294 (0.00)	0.003 (0.26)	0.003 (0.26)
<i>R&D</i>	2.605 (0.00)	2.564 (0.00)	0.120 (0.00)	0.121 (0.00)

Panel B: By Brand name groups

Variables	Industry Specialist		Industry Specialist	
	Big N audited firm years		non-Big N audited firm years	
	OLS	2SLS	OLS	2SLS
<i>Intercept</i>	0.187 (0.00)	0.183 (0.00)	-0.015 (0.00)	-0.018 (0.00)
<i>Leverage</i>	-0.002 (0.36)		0.003 (0.02)	
<i>IVLeverage</i>		0.047 (0.00)		0.018 (0.00)
<i>Size</i>	0.009 (0.00)	0.008 (0.00)	0.004 (0.00)	0.004 (0.00)
<i>Fixed assets</i>	0.002 (0.23)	-0.003 (0.00)	0.010 (0.00)	0.007 (0.00)
<i>Cycle</i>	0.000 (0.96)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
<i>P-E ratio</i>	0.000 (0.97)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
<i>Issue</i>	0.011 (0.00)	0.016 (0.00)	0.006 (0.00)	0.007 (0.00)
<i>Loss</i>	0.000 (0.89)	-0.007 (0.00)	-0.002 (0.09)	-0.004 (0.00)
<i>Regulation</i>	0.010 (0.00)	0.012 (0.00)	0.046 (0.00)	0.044 (0.00)
<i>R&D</i>	0.031 (0.00)	0.055 (0.00)	0.009 (0.12)	0.011 (0.06)

This table presents the results of testing the impact of leverage on firms' choice of auditor after controlling for endogeneity using 2-stage probit least square (for the brand name regression) and 2-stage least square (for the industry specialization model). The results from the single equation model are also provided as comparison.

IVLeverage is the predicted value obtained in the first stage that regress leverage on all predetermined variables in the system. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm transformation of total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item

#108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. We also control for year and industry fixed effects.

TABLE 9

**Segregating the Effects of Public and Private Debt on Auditor Choice - Control for
Endogeneity Using 2SPLS and 2SLS**

Panel A: Private debt				
Variables	Brand Name		Industry Specialist	
	Probit	2SPLS	OLS	2SLS
<i>Intercept</i>	-2.111 (0.00)	-2.104 (0.00)	0.020 (0.00)	0.018 (0.00)
<i>Leverage</i>	-0.429 (0.00)		-0.020 (0.00)	
<i>IVLeverage</i>		-0.288 (0.00)		-0.010 (0.08)
<i>Size</i>	0.456 (0.00)	0.453 (0.00)	0.024 (0.00)	0.024 (0.00)
<i>Fixed assets</i>	0.136 (0.00)	0.118 (0.00)	0.004 (0.00)	0.003 (0.07)
<i>Cycle</i>	-0.006 (0.00)	-0.006 (0.00)	0.000 (0.00)	0.000 (0.00)
<i>P-E ratio</i>	0.001 (0.00)	0.001 (0.01)	0.000 (0.52)	0.000 (0.68)
<i>Issue</i>	0.054 (0.07)	0.070 (0.04)	0.009 (0.00)	0.010 (0.00)
<i>Loss</i>	0.076 (0.00)	0.056 (0.01)	0.001 (0.64)	-0.001 (0.63)
<i>Regulation</i>	-0.264 (0.00)	-0.267 (0.00)	0.011 (0.00)	0.011 (0.00)
<i>R&D</i>	2.739 (0.00)	2.742 (0.00)	0.125 (0.00)	0.129 (0.00)

Panel B: Public debt				
Variables	Brand Name		Industry Specialist	
	Probit	2SPLS	OLS	2SLS
<i>Intercept</i>	1.100 (0.00)	1.006 (0.00)	0.089 (0.00)	0.056 (0.00)
<i>Leverage</i>	0.108 (0.28)		0.011 (0.04)	
<i>IVLeverage</i>		0.261 (0.59)		0.074 (0.00)
<i>Size</i>	0.166 (0.00)	0.172 (0.00)	0.018 (0.00)	0.020 (0.00)
<i>Fixed assets</i>	0.113 (0.10)	0.106 (0.13)	0.016 (0.00)	0.013 (0.00)
<i>Cycle</i>	-0.010 (0.00)	-0.011 (0.00)	0.000 (0.10)	0.000 (0.01)
<i>P-E ratio</i>	0.001 (0.12)	0.001 (0.12)	0.000 (0.39)	0.000 (0.58)
<i>Issue</i>	0.045 (0.89)	0.024 (0.94)	0.010 (0.56)	0.004 (0.84)
<i>Loss</i>	-0.056 (0.32)	-0.076 (0.37)	-0.003 (0.31)	-0.012 (0.01)
<i>Regulation</i>	-0.178 (0.01)	-0.176 (0.01)	-0.006 (0.11)	-0.006 (0.14)
<i>R&D</i>	2.318 (0.02)	2.477 (0.03)	-0.059 (0.16)	0.007 (0.88)

This table presents the results of testing whether the impact of leverage on firms' choice of auditor differs between firms that have access to the public debt market (with S&P ratings available) and firms that only have private debt (without S&P ratings) after controlling for endogeneity using 2-stage probit least square (for the brand name regression) and 2-stage least square (for the industry specialization model). The results from the single equation models are also provided as comparison.

IVLeverage is the predicted value obtained in the first stage that regresses leverage on all predetermined variables in the system. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm transformation of total assets. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings

per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one if a firm is a member of regulated industries and zero otherwise. We also control for year and industry fixed effects. P-values are reported in parentheses.

TABLE 10
Conservatism and Auditor Choice

Variables	Brand Name	Industry Specialist	Big N audited firm- years
<i>Intercept</i>	-0.061 (0.00)	-0.008 (0.00)	0.022 (0.00)
<i>Return</i>	-0.061 (0.00)	-0.054 (0.00)	-0.029 (0.00)
<i>Return*DR</i>	0.334 (0.00)	0.408 (0.00)	0.430 (0.00)
<i>DR</i>	-0.016 (0.02)	-0.005 (0.30)	0.010 (0.08)
<i>Auditor</i>	0.095 (0.00)		
<i>Specialization</i>		0.152 (0.00)	0.055 (0.00)
<i>Return*Auditor</i>	0.020 (0.00)		
<i>Return*Specialization</i>		0.029 (0.02)	-0.054 (0.00)
<i>Return*DR*Auditor</i>	0.139 (0.00)		
<i>Return*DR*Specialization</i>		0.272 (0.00)	0.210 (0.00)
<i>DR*Auditor</i>	0.027 (0.00)		
<i>DR*Specialization</i>		0.054 (0.02)	0.002 (0.92)
<i>Adjusted R-square</i>	0.081	0.073	0.084

This table presents the results of testing whether financial reports audited by Big N/industry specialist auditors are more conservative. There are 107,086 observations in the brand name and industry specialization full sample. There are 84,761 observations in the Big N audited firm year sub-sample. The samples cover the time horizon of 1988 to 2006.

The dependent variable is *Earning* defined as earnings per share excluding extraordinary items (Compustat item #58) scaled by the close price per share (Compustat item #199) at the beginning of the fiscal year. *Return* is the fiscal year buy-and-hold return. *DR* is an indicator variable that equals one if *Return* is less than zero and zero otherwise. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm.

P-values are reported in parentheses.

TABLE 11

Cost of Debt and Auditor Choice

Variables	Pred. Sign	Full sample (120,295 obs)		Public debt (28,774 obs)		Private debt only (91,521 obs)	
		Brand Name	Industry Specialists	Brand Name	Industry Specialists	Brand Name	Industry Specialists
<i>Intercept</i>	+	0.343 (1.00)	0.336 (1.00)	0.092 (1.00)	0.089 (1.00)	0.152 (0.00)	0.151 (0.00)
<i>Auditor</i>	-	-0.007 (0.00)		-0.004 (0.02)		-0.010 (0.00)	
<i>Specialization</i>	-		-0.011 (0.00)		-0.007 (0.00)		-0.009 (0.02)
<i>Leverage</i>	+	-0.060 (0.00)	-0.060 (0.00)	-0.023 (0.00)	-0.023 (0.00)	-0.064 (0.00)	-0.063 (0.00)
<i>Prime rate</i>	+	-0.008 (1.00)	-0.008 (1.00)	0.004 (1.00)	0.004 (1.00)	0.001 (0.00)	0.001 (0.00)
<i>Default</i>	+	-0.064 (1.00)	-0.062 (1.00)	0.013 (1.00)	0.013 (1.00)	0.001 (0.52)	0.001 (0.34)
<i>Size</i>	-	-0.005 (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.005 (0.00)	-0.004 (0.00)	-0.004 (0.00)
<i>Fixed assets</i>	-	-0.018 (0.00)	-0.018 (0.00)	-0.007 (0.00)	-0.007 (0.00)	-0.021 (0.00)	-0.021 (0.00)
<i>Negative equity</i>	+	0.044 (0.00)	0.044 (0.00)	0.031 (0.00)	0.031 (0.00)	0.046 (0.00)	0.046 (0.00)
<i>Profitability</i>	-	-0.043 (0.00)	-0.044 (0.00)	-0.029 (0.00)	-0.029 (0.00)	-0.045 (0.00)	-0.045 (0.00)
<i>Adj. R²</i>		0.084	0.084	0.132	0.132	0.070	0.069

This table presents the results of testing whether firms with Big N auditors/industry specialist auditors are rewarded with lower cost of debt. The samples cover the time horizon of 1988 to 2006.

The dependent variable is *Interest rate* defined as interest expenses (Compustat item #15) divided by the average total debt for the year. *Auditor* is an indicator variable that equals 1 if an auditor is one of the Big N and 0 otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. *Leverage* is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Prime rate* is the average prime rate for a year. *Default* is the difference between the yield on BAA-rated bonds and the yield on 10-year treasury bonds for the year. *Size* is the natural logarithm of total assets (Compustat item #6) in the regressions and total assets (Compustat item #6) in the descriptive statistics. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Negative equity* is an indicator variable that equals one if the common stockholders' equity (Compustat item #60) is negative and zero otherwise. *Profitability* is income before extraordinary income (Compustat item #34) divided by total assets.

The p-value is reported in the parentheses.

TABLE 12

Auditor Choice and Leverage: the Influence of Firm Sizes

Variable	Brand Name			
	Quantile 1	Quantile 2	Quantile 3	Quantile 4
<i>Intercept</i>	-4.567 (0.00)	-4.792 (0.00)	-4.156 (0.00)	0.722 (0.05)
<i>Leverage</i>	-0.869 (0.00)	-0.907 (0.00)	-0.264 (0.02)	-0.205 (0.29)
<i>Size</i>	0.867 (0.00)	0.902 (0.00)	0.855 (0.00)	0.282 (0.00)
<i>Fixed assets</i>	0.294 (0.00)	0.333 (0.00)	0.270 (0.00)	0.083 (0.52)
<i>Cycle</i>	-0.011 (0.00)	-0.008 (0.00)	-0.018 (0.00)	-0.008 (0.12)
<i>P-E ratio</i>	-0.001 (0.19)	0.002 (0.00)	0.002 (0.07)	0.005 (0.00)
<i>Issue</i>	-0.058 (0.38)	0.504 (0.00)	0.461 (0.03)	-1.567 (0.00)
<i>Loss</i>	0.163 (0.00)	0.173 (0.00)	-0.011 (0.88)	0.397 (0.00)
<i>Regulation</i>	-0.764 (0.00)	0.015 (0.92)	-0.249 (0.09)	-0.279 (0.02)
<i>R&D</i>	3.903 (0.00)	7.365 (0.00)	7.896 (0.00)	1.884 (0.27)

Variable	Industry Specialist			
	Quantile 1	Quantile 2	Quantile 3	Quantile 4
<i>Intercept</i>	-0.030 (0.00)	-0.027 (0.01)	0.057 (0.00)	0.106 (0.00)
<i>Leverage</i>	-0.017 (0.00)	-0.021 (0.00)	-0.012 (0.01)	-0.002 (0.72)
<i>Size</i>	0.023 (0.00)	0.026 (0.00)	0.022 (0.00)	0.016 (0.00)
<i>Fixed assets</i>	0.007 (0.00)	0.003 (0.24)	0.007 (0.02)	0.010 (0.00)
<i>Cycle</i>	0.000 (0.01)	0.000 (0.05)	-0.001 (0.00)	0.000 (0.20)
<i>P-E ratio</i>	0.000 (0.82)	0.000 (0.37)	0.000 (0.30)	0.000 (0.91)
<i>Issue</i>	0.009 (0.00)	0.008 (0.09)	0.003 (0.65)	0.035 (0.02)
<i>Loss</i>	0.005 (0.01)	0.004 (0.10)	0.003 (0.17)	-0.009 (0.00)
<i>Regulation</i>	-0.022 (0.01)	0.020 (0.01)	0.049 (0.00)	-0.016 (0.00)
<i>R&D</i>	0.114 (0.00)	0.111 (0.00)	0.066 (0.00)	-0.021 (0.55)

This table presents the results of testing whether and how the auditor choice and leverage relation varies by firm sizes. The full sample is partitioned based on total assets into quartiles. Quartile 1 has total assets of less than \$25.183 million, quartile 2 from \$25.183 to \$117.233 millions, quartile 3 from \$117.233 to \$627.200 millions and quartile 4 greater than \$627.200 millions.

The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. Leverage is the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm of total assets (Compustat item #6) in the regressions and total assets (Compustat item #6) in the descriptive statistics. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one a firm is a member of regulated industries and zero otherwise. *R&D* is the research and development expense (Compustat item #46) scaled by total assets. We also control for the year and industry fixed effects.

TABLE 13

Auditor Choice and Leverage: Industry-adjusted Leverage

Variables	Pred.	Brand name	Industry specialists
	Sign		
<i>Intercept</i>	?	-3.812 (0.00)	0.035 (0.00)
<i>Leverage IA</i>	?	-0.605 (0.00)	-0.018 (0.00)
<i>Size</i>	+	0.829 (0.00)	0.023 (0.00)
<i>Fixed assets</i>	+	0.098 (0.00)	0.003 (0.01)
<i>Cycle</i>	+	-0.017 (0.00)	0.000 (0.00)
<i>P-E ratio</i>	+	0.001 (0.00)	0.000 (0.29)
<i>Issue</i>	+	0.136 (0.01)	0.010 (0.00)
<i>Loss</i>	-	0.141 (0.00)	0.000 (0.83)
<i>Regulation</i>	+	-0.893 (0.00)	0.002 (0.44)
<i>R&D</i>	+	4.794 (0.00)	0.101 (0.00)

This table tests the relation between auditor choice and leverage where leverage is adjusted by the industry median. The dependent variable is *Auditor* for the brand name test and *Specialization* for the industry specialist regression. *Auditor* is an indicator variable that equals one if an auditor is one of the Big N and zero otherwise. *Specialization* is the proportion of two-digit SIC industry sales for a year audited by each audit firm. Leverage IA is the difference between a firm's leverage and 2-digit SIC industry median leverage where leverage is calculated as the sum of short-term debt (Compustat item #34) and long-term debt (Compustat item #9) divided by total assets (Compustat item #6). *Size* is the natural logarithm of total assets (Compustat item #6) in the regressions and total assets (Compustat item #6) in the descriptive statistics. *Fixed assets* is the gross property, plant and equipment (Compustat item #7) divided by total assets. *Cycle* is the sum of days' inventory and days' accounts receivable divided by 30. *P-E ratio* is the close price per share (Compustat item #199) divided by earnings per share excluding extraordinary items (Compustat item #58). *Issue* is the net new equity issue (Compustat item #108 - #115) during the year scaled by total assets. *Loss* is an indicator variable that equals one if current income (Compustat item #172) is negative and zero otherwise. *Regulation* is an indicator variable that equals one a firm is a member of regulated industries and zero otherwise. We also control for the year and industry fixed effects.

The p-value is reported in the parentheses.