PRICEWATERHOUSECOOPERS IS DIFFERENT:

AUDITOR MONITORING STRENGTH DIFFERENCES

AMONG THE BIG 4

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There has been little research comparing the relative auditor monitoring strength of the Big 4 CPA firms. Users of audited financial statements often practically have no other CPA firms to choose from for auditing services in the large public company auditing services market and thus desire more of this information. In 1008 financial reporting lawsuits against auditees filed from 1999 through 2004, the auditor litigation outcomes are used to proxy for the likelihood of audit failure and thus for auditor monitoring strength. Control variables significant in prior empirical work were used in polytomous regression. PricewaterhouseCoopers has comparatively better auditor litigation outcomes, which proxies for a lower likelihood of audit failure and a stronger auditor monitoring strength. These results are insensitive despite the use of three different numbers of categories of auditor litigation outcomes, and despite the use of three different high technology indexes, and thus appear to be robust.

Key Words: *Audit quality, Private securities litigation, SEC enforcement actions, criminal prosecutions*

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I. Introduction

The disclosure of more relevant information on auditor quality has the potential to more strongly motivate higher auditor quality, because users of audited financial statements care about auditor quality (Barker 2002). Also, audit committees care about auditor quality, especially since the incentives and capabilities of audit committees to monitor auditor quality and take actions to facilitate auditor quality were recently increased (Coffee 2006). Currently, 496 of the 500 companies whose stocks are included in the S&P 500 are audited by the Big 4 (Compustat 2006). Thus, relevant information on auditor quality in the large public company auditing services market requires a comparison of auditor quality among the Big 4 CPA firms. Such information is scarce, as it has long been the tradition in most empirical auditor quality research to only compare the aggregate auditor quality of the Big 4 (or 5 or 6 or 8) auditors to the smaller CPA firm auditors.

The auditor monitoring strength of each of the Big 4 was hypothesized based on the results of prior empirical research. It was measured using the auditor's outcome in financial reporting litigation, which is an approximation of the likelihood of the occurrence of an audit failure. That, in turn, is indicative of auditor monitoring strength, a component of audit quality. "Audit quality is inversely related to audit failures: the higher the failure rate, the lower the quality of auditing … the most convincing evidence of an outright audit failure occurs when there is litigation against auditors…" (Francis 2004).

Watkins et al. (2004) decompose audit quality into auditor reputation and auditor monitoring strength. While the two are related, it is an empirical question as to how closely related auditor reputation and auditor monitoring strength are. Thus it is important maintain the distinction. Auditor reputation is based on users' (of audited financial statements) beliefs about auditor monitoring strength. Auditor monitoring strength is the extent that the auditor minimizes the divergence of the auditee's reported economic circumstances from the "true", unobservable, economic circumstances of the auditee (Watkins et al. 2004). Auditor monitoring strength is comprised of competence and independence (DeAngelo 1981). The products of audit quality are information credibility and information quality (Watkins et al. 2004).

Auditor monitoring strength is the construct users of audited financial statements want to comparatively assess. They probably would have little interest in auditor reputation but for the impossibility of direct observation of auditor monitoring strength. People specifically interested in auditors also would (if direct observation of auditor monitoring strength were possible) not likely to be interested per se in information credibility or information quality, since these are primarily a product of management.[1] Also, it is difficult to discern the role of the auditor. For example, if a company's financial statements appear to have high information quality (since there is no financial reporting litigation against the company), that could be due to the auditor's influence. Alternatively, the auditor could be irrelevant, and the apparently high information quality

[1] Users of audited financial statements obviously care, not just about the auditor, but also about the financial statements. Audited financial statements are a co-product of the auditor. However, conflating financial reporting quality and auditor quality can create confusion, making it difficult to significantly advance our knowledge of either construct.

financial statements could be entirely due to the company's competent and ethical management and financial and accounting personnel.

Thus, the data collection for this paper began with 1008 apparently low information quality financial statements. In these 1008 observations, financial reporting lawsuits were filed against large CPA firm auditees from 1999 through 2004. The outcome of the auditor in each lawsuit was then determined. For example, if a case did not name the auditor as a defendant, the case was given a 0 score. If the auditor was named a defendant but made no settlement, the case got a 100. And so on, up to 500 if the auditor was criminally prosecuted, the most severe of six outcomes.

PricewaterhouseCoopers had, compared to the other members of the Big 4, better auditor litigation outcomes. This, in the context of Watkins (2004), suggests that PricewaterhouseCoopers may provide stronger auditor monitoring strength than the other members of the Big 4. The results are based on multivariate analysis. Five variations of the mulitivariate model were used. The results are insensitive to the choice of the number of auditor litigation outcome categories. The results are also insensitive to the choice of definition of which SIC codes comprise the high technology industry sector.

The following section summarizes theory and research in auditor quality. Section 3 presents the hypotheses. Section 4 describes the sample selection. Section 5 presents the empirical model. Descriptive statistics and the results of hypothesis testing are found in Section 6. Section 7 discusses the conclusions. The limitations and suggestions for future research are discussed in Section 8.

2. Intra-Big 4 auditor quality theory and research

2.1. The DeAngelo (1981) theory of audit quality

DeAngelo (1981) articulated the best known audit quality theory. Audit quality is comprised of independence and competence. Independence is the more important component with regard to understanding why the size of the CPA firm theoretically matters. The larger the CPA firm, the greater the value of its reputation capital, and the less inclined the CPA firm is to risk it by acquiescence in a single audit client's unethical or illegal financial reporting.

A larger CPA firm has greater reputation capital because the aggregate audit revenue of all of its other audit clients acts as larger and more effective collateral, or security, pledging the rendering of a higher quality audit. It thus would be more irrational for a larger CPA firm to not perform a higher quality audit than it would be for a smaller CPA firm to not perform a higher quality audit.

One interpretation of DeAngelo (1981) is that empirical evidence should show the unambiguously largest CPA firm(s) to be the highest quality auditor(s), the second largest CPA firm(s) to be the second highest quality auditor(s), the third largest CPA firm(s) to be the third highest quality auditor(s), etc. However, analysis of the Big 4 plus Arthur Andersen during the six year period of this study leads to the conclusion that there is ambiguity as to the relative sizes of the CPA firms.

Table 2 shows the auditor size data for each of the 12 issues of *Who Audits America* (Data Financial Press 1996-2001) from June 1996 to December 2001. Since litigation is generally preceded by performance of an audit by two or three years, and the study's 1008 observations are of litigation against auditees commenced 1999 to 2004, these are the relevant issues of *Who Audits America*. The largest auditor, measured by millions of sales dollars audited and by the number of its auditees, is in bold. The

smallest auditor is in italics. On average, as well as in each individual six month period during the study, PricewaterhouseCoopers was the largest auditor, measured by sales dollars audited. On average, during the study, PricewaterhouseCoopers also was the largest auditor, measured by its number of auditees. However, Ernst & Young was the largest auditor, measured by its number of auditees, in June and December 2001. KPMG was the smallest auditor, measured by sales dollars audited. Deloitte & Touche was the smallest auditor, measured by the number of its auditees.

One could take the position that it is sales dollars audited that should be used to measure auditor size. The audit of a very large company could consume a hundred times the auditing time and effort compared to a small company. Logically, audit failure (proxied by auditor litigation outcome) per auditing time and effort is what should be measured in a study of auditor monitoring strength. An opposing argument is that the work of the auditor may have greater importance to the financial reporting of a small company due to possibly weaker internal expertise and control. Thus, the audits of small companies may constitute more rigorous tests of auditor monitoring strength and hence the number of auditees should be used to measure auditor size. On balance, neither measure is clearly better.

In any event, there is ambiguity as to who (PricewaterhouseCoopers or Ernst & Young) was the largest auditor. There also is ambiguity as to who (Deloitte & Touche or KPMG) was the smallest auditor. Also, Nagy (2005), Fuerman (2006), and Krishnamurthy et al. (2006), provide evidence that Arthur Andersen was a lower quality auditor than the Big 4. DeAngelo (1981) fails to explain the results of these empirical studies, as well as the qualitative critiques of Toffler (2004) and Squires et al. (2004).

2.2. The Watkins et al. (2004) theory of audit quality

Watkins et al. (2004), unlike DeAngelo (1981), and others, carefully maintain the distinction between auditor reputation (perceived competence and independence) and auditor monitoring strength (competence and independence). Blurring this distinction leads to confusion in the performance and interpretation of empirical research. While both constructs are interesting, auditor monitoring strength is the focus of this paper.

Watkins et al. (2004) note that the information credibility and information quality of financial statements is a product of auditor quality. However, even if measured accurately, information credibility and information quality of financial statements can only tentatively be attributed, and only partly, to the auditor. This is because the financial statements are primarily the responsibility of the company.

Thus, if a nonoccurrence of litigation is observed, it cannot be definitively concluded that this is an observation of relatively high audit quality. One can, of course, speculate that the presence of a certain CPA firm as the auditor enhanced the information credibility and information quality of the financial statements. However, it is alternatively plausible that the high information credibility and information quality were caused solely by the company's ethical and competent management and financial and accounting personnel. For this reason, the data for this paper consists entirely of 1008 observations of apparently low information quality financial statements. Nonoccurrence of litigation is not part of this research. Indeed, although early empirical research used nonoccurrence of litigation (Palmrose 1988; Stice 1991; Lys and Watts 1994), subsequent research has more often used observations of litigation against auditees and then

determined which of them had auditor defendants. Table 1 summarizes nine such studies.

2.3. Empirical research suggesting that PricewaterhouseCoopers and Ernst & Young are higher quality auditors

Moizer (1997) reviewed audit fee studies, IPO underpricing studies, and auditor change studies. In most of the studies, there did not appear to be quality differences among the large CPA firms. An exception to this generalization is that Price Waterhouse, during the 1980's, was identified with higher quality, in the United States, Canada and New Zealand, based on audit fee and IPO underpricing metrics. However, Price Waterhouse no longer exists, having been succeeded by PricewaterhouseCoopers, a product of the merger of Price Waterhouse and Coopers & Lybrand.

Gilbertson and Avila (1999) found, in private securities class actions that settled 1990-1993, that Arthur Young and Ernst & Young were named defendants in a lower percentage of the lawsuits than the other auditors. This suggests that Arthur Young was, and Ernst & Young is, a higher quality auditor. However, Arthur Young/Ernst & Young were not compared to the other large CPA firms. Instead, they were compared to a mix of both large and small CPA firms, making the interpretation (so far as intra-Big CPA firm audit quality) of the results unclear. Also, Arthur Young no longer exists, having been succeeded by Ernst & Young, a product of the merger of Arthur Young and Ernst & Whinney.

Fung and Gul (2005) used several different proxies for auditor quality. They compared Ernst & Young and PricewaterhouseCoopers, in the aggregate, to Deloitte & Touche, KPMG, and Arthur Andersen, in the aggregate. They compared Ernst & Young

to Deloitte & Touche, KPMG, and Arthur Andersen, in the aggregate. They also compared PricewaterhouseCoopers to Deloitte & Touche, KPMG, and Arthur Andersen, in the aggregate.

The appropriateness of their aggregation of Deloitte & Touche, KPMG, and Arthur Andersen, based on an implicit assumption that the auditor quality of those three CPA firms is homogeneous, is contradicted by the findings of prior empirical research, as noted above. They did not test whether Ernst & Young, controlling for the presence of PricewaterhouseCoopers, Deloitte & Touche, and KPMG, is a higher quality auditor. They also did not test whether PricewaterhouseCoopers, controlling for the presence of Ernst & Young, Deloitte & Touche, and KPMG, is a higher quality auditor. Nonetheless, their findings suggest that Ernst & Young and PricewaterhouseCoopers are higher quality auditors.

2.4. Empirical research finding no results, or ambiguous results, on the question of the existence of auditor quality differences among the large CPA firms.

Accounting research journals do not generally publish 'no results' studies (Francis 2004). Yet, given the critical importance of the issue of comparative auditor monitoring strength among the large CPA firms - to financial statement users, audit committees, regulators, and the public at large - 'no results' studies, as well as 'ambiguous results' studies, should be considered. The earliest of such studies are summarized, as noted above, by Moizer (1997), who concluded that some, but not all, research results suggested that Price Waterhouse was a higher quality auditor than the other large CPA firms.

Palmrose (1988) examined the 1960-1985 lawsuits of auditors, scaled by the number of audit clients, to compare the relative auditor quality of CPA firms. Palmrose (1988) also performed a second comparison putting in the numerator the cases where she had data suggesting the auditor paid at least $1,000,000 to settle. This was done in an attempt to screen out the frivolous cases, since they arguably should not influence auditor quality rankings. The rankings were not significant (even univariate) in her first lawsuit occurence analysis. However, her rankings (Arthur Young with the lowest percentage of litigation and hence the best auditor monitoring strength, followed by Price Waterhouse, Ernst & Whinney, Deloitte Haskins & Sells, Coopers & Lybrand, Peat Marwick Mitchell, Arthur Andersen, and Touche Ross, respectively) were significant in her second (meritorious cases) lawsuit occurrence analysis. She concluded that she "found some significant differences in litigation activity, particularly when focusing on meritorious litigation. However, these classifications were not unambiguous as results appeared sensitive to the type of analysis (Palmrose 1988, at 72)."

Palmrose (1988) was a step forward for auditor quality research. It was the first to empirically analyze auditor litigation, which, despite its noise and imprecision, is at least a proxy or measure of the impossible to directly observe construct of auditor monitoring strength. In this respect, analysis of auditor litigation is arguably more credible than analyses of various proxies for the impossible to directly observe constructs of financial statements information credibility (for example, using earnings response coefficients), financial statements information quality (for example, using discretionary accruals), or auditor reputation (for example, using surveys).

During the twenty years since Palmrose (1988), several concerns have arisen. First, results based on multivariate analysis are absent. Second, the use of dollar amounts paid to settle litigation as an outcome measure is a concern. Only a small minority of settlement notices of private securities class actions provide the amounts that the auditor paid (if the auditor settled). Instead, settlement notices typically only disclose the aggregate settlement, the contributors to the settlement, and the amount paid by the company. In direct actions (private actions that are not class actions) the parties often stipulate that the amounts paid by the various parties are to remain confidential. Since the disclosure (nondisclosure) of the amount paid by the auditor, like every other aspect of the legal process, is viewed strategically by litigation participants and their attorneys, it seems questionable to assume that the settlements that disclose the amount paid by the auditor are representative of the amounts that the auditors actually pay to settle cases in the aggregate. Putting those concerns aside, it seems certain that some settlements with auditors below a $1,000,000 (in 1980's dollars) threshold are due, not to the frivolous nature of the lawsuit, but the insolvency of the CPA firm. For example, WorldCom and other cases were settled by Arthur Andersen after 2004 at a fraction of the amount they would have, but for Arthur Andersen's poor financial condition.[2]

Another concern about Palmrose (1988) is that the litigation occurrence and resolution data were collected and analyzed without a theoretical framework based on economics, law, moral theory and criminology. These disciplines are critically important

[2] This is the author's opinion. However, it is informed by reading the transcript of the 2005 trial of the WorldCom private securities class action against Arthur Andersen, and the settlement notices of other class actions, and the financial press. It is also based on discussions with attorneys litigating these cases. It also rests on a key difference compared to the Laventhol & Horwath November 1990 bankruptcy. Arthur Andersen is organized as a limited liability partnership. This creates great legal uncertainty as to the likelihood of plaintiffs succeeding in extracting assets from the individual Arthur Andersen partners.

for this cross disciplinary empirical research. As will be discussed later, there is a suit and settlement literature that reached a clear consensus, in the context of law and economics, by the early 1980's, at least as to the tri-level taxonomy of the auditor being named a defendant (not named a defendant), and the auditor paying to settle (not paying to settle). Also, the business misconduct literature (law, moral theory and criminology) evolved a clear consensus, beginning as early as Sutherland (1940), as to the tri-level taxonomy of the auditor being named a defendant in a private civil suit versus a government civil suit or administrative proceeding, versus a criminal prosecution. Combining the knowledge of these disciplines creates a taxonomy that blunts the impact of the unknown number of frivolous lawsuits and thus meaningfully assesses each CPA firm's auditor monitoring strength without the use of a problematic settlement dollar amount cutoff.

Another concern about Palmrose (1988) is the confounding comparison of the number of times auditors were named defendants to the total audits performed. The reason this is a confounding is that the nonoccurrence of the auditor being named a defendant can be because of fundamentally different reasons. For example, if no financial reporting lawsuit against the auditee occurs, this could be due to high quality financial reporting by the company, and completely unrelated to the quality of the auditing. Further, if no financial reporting lawsuit occurs, there will not be an auditor defendant because a financial reporting lawsuit is a precondition for there to be an auditor defendant. Thus, the Palmrose (1988) research design, or any research design (Lys and Watts 1994, and Stice 1991, which used matched pairs designs, are the other prominent examples) which compares the nonoccurrence of financial reporting lawsuits to lawsuits

with auditor defendants, is a problematic research design for gaining insight into auditor quality. Auditor quality and financial reporting quality are conflated. Put another way, we can only speculate, if there is a nonoccurrence of a financial reporting lawsuit, whether this (in the context of Watkins et al. 2004) apparent high financial statements information quality is because the company and its management had a propensity for competent and ethical financial reporting, regardless of the activity of its auditor, or whether the auditor actually indirectly had something positive to do with the financial reporting via his auditing activities.

The restatement (nonrestatement) of previously issued financial statements is a proxy for the construct of financial statements information quality (Watkins et al. 2004). Eisenberg and Macey (2004) compared the restatements of companies associated with Arthur Andersen to the restatements of companies associated with the Big 4. They reported no significant results. They thus concluded that there was no difference between Arthur Andersen's auditor quality and the auditor quality of the Big 4.

There are two concerns with the methods and conclusions of Eisenberg and Macey (2004). First, since a restatement is a proxy for financial statements information quality, this is less credible than using auditor litigation outcomes, which proxy (albeit with noise and imprecision) auditor monitoring strength. Second, their analysis was based on inappropriate data. In some of their observations, the company restated audited annual financial statements. In others, the company only restated unaudited quarterly financial statements. This would be fine, in a study of financial statements information quality. In a purported study of auditor quality, this is unacceptable, as "restatements of quarterly information ... do not necessarily imply low quality audits because most interim

financial statements are subject only to review procedures and not to audit examination" (Woodland and Reynolds 2003). In an investigation of auditor quality the analysis should be limited to restatements of financial statements that were audited.

Kumar and Lim (2007) compared the earnings response coefficients of companies associated with Arthur Andersen to the restatements of companies associated with the Big Four. They had no significant results. They thus concluded that there was no difference between Arthur Andersen's auditor quality and the auditor quality of the Big Four. Since the earnings response coefficient, as noted, is a proxy for financial statements information credibility, not auditor monitoring strength, this is not as good a proxy to use as auditor litigation outcomes.

Kumar and Lim (2007) also compared the predictive power and propensity to issue going concern opinions of companies associated with Arthur Andersen to the going concern opinions of companies associated with the Big Four. Again, they had no significant results. They thus again concluded that there was no difference between Arthur Andersen's auditor quality and the auditor quality of the Big Four. However, empirical evidence reported in Carcello and Palmrose (1994) suggests that users of financial statements care much more about financial statements information quality than they do about whether a going concern audit opinion was given by the auditor prior to bankruptcy. Thus, it is fair to question, from the point of view of users, whether going concern opinion is a good proxy for any of the auditor quality constructs of Watkins et al. (2004).

3. The hypotheses

Based on the results of prior empirical research, the following are hypothesized:

H_1: PricewaterhouseCoopers provides stronger auditor monitoring strength than the other Big 4 CPA firms.

H_2: Ernst & Young provides stronger auditor monitoring strength than the other Big 4 CPA firms.

4. The sample

The first stage of the data collection yielded 1,133 observations of private securities class actions commenced 1999 through 2004. These were found in *Securities Class Action Alert* ("*SCAA*") or the *Securities Class Action Services* ("*SCAS*") database.[3] All of these 1,133 lawsuits concern allegedly deficient financial disclosure by companies. Some of the *SCAA/SCAS* lawsuits have related government civil or criminal prosecutions. After the collection of observations from *SCAA/SCAS*, SEC Accounting and Auditing Enforcement Releases ("AAERs") were read to determine which observations of auditor defendants (if not already found in *SCAA/SCAS*) to add to the sample. Then, the material hyperlinked to the Justice Department Office of the Deputy Attorney General Significant Criminal Cases and Charging Documents website at http://www.usdoj.gov/dag/cftf/cases.htm was read to determine which observations of auditor defendants (if not already found) to add to the sample. Finally, LEXIS NEXIS was searched for additional government civil or criminal auditor defendants. The sample now increased from 1,133 observations to 1,169 observations, with all litigation

[3]December 2002 was the last issue of *SCAA*. The internet based *SCAS* database was searched for 2003 and 2004. Also, for those lawsuits that have settled and had their settlement notice posted to the *SCAS* database, or elsewhere on the internet, the settlement notice was searched to determine if the auditor paid to settle. Normally, an auditor does not pay to settle unless the auditor is named a defendant in the private action. However, there are two observations (one Arthur Andersen and one Deloitte & Touche) where the CPA firm paid the plaintiffs even though it was not named a defendant in the private action.

commenced during the 1999-2004 period. Restricting the sample to the auditees of the five largest CPA firms of the period, which dominated the large public company auditing services market, reduced the sample to 1,008 observations.

5. The empirical model

5.1. The model and its five variations

The hypotheses were tested using a cumulative logit (proportional odds) model. The model is OUTCOME = $\beta_0 + \beta_1$DT + β_2EY + β_3KPMG + β_4PwC + β_5BANKRUPT + β_6HIGHTECH + β_7TOTALASSETS + β_8US + e and the variables are defined as follows:

OUTCOME is a polytomous, six level, ordinal response variable, coded as follows:

= 0 = auditor was never a defendant in a private action; or

= 100 = auditor is or was a defendant in a private action; or

= 200 = auditor paid to settle a private action; or

= 300 = auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding; or

= 400 = auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit; or

= 500 = auditor is or was a defendant in a criminal prosecution.

DT = 1 = Deloitte & Touche auditor; 0 = otherwise

EY = 1 = Ernst & Young auditor; 0 = otherwise

KPMG = 1 = KPMG auditor; 0 = otherwise

PwC = 1 = PricewaterhouseCoopers auditor; 0 = otherwise

BANKRUPTCY	= 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise
HIGHTECH	= 1 = high tech industry auditee (defined by American Electronics Association); 0 = otherwise
TOTALASSETS	= natural log of auditee total assets in thousands of US dollars
US	= 1 = US auditee (defined by principal executive office); 0 = non-US auditee

Five variations of this model were used for the empirical hypothesis testing, in order to determine whether the findings are insensitive to the type of analysis and hence robust. The first variation is the six category response variable model, strictly mirroring the theory. The second and third variations are suggested by Allison (1999). He asserts that "the [cumulative logit] model won't work for rank-ordered data in which no two individuals have the same rank – there would be more parameters to estimate than observations in the sample. As a very rough rule of thumb, I would say that it's reasonable to estimate a cumulative logit model if there are at least 10 observations for each category on the dependant variable." As shown in Table 3, there are 6 observations in the 500 category, 8 in the 400 category, and 20 in the 300 category. For the second variation of this model, the 14 observations in the 500 and 400 categories are combined, creating a five category response variable model. For the third variation of this model, the 34 observations in the 500, 400 and 300 categories are combined, creating a four category response variable model.

There is some evidence that if an auditee is a high technology company, there is a propensity for the auditor to not be named a defendant in private litigation, for reasons

explained in section 5.3. There is not unanimity, though, on the question of which SIC codes should be regarded as high technology industries. Thus, the fourth and fifth variations of the model test two additional definitions (sets of SIC codes) used in prior litigation research for a high technology index.

5.2. The six levels of the polytomous response variable

"Audit quality is inversely related to audit failures: the higher the failure rate, the lower the quality of auditing … the most convincing evidence of an outright audit failure occurs when there is litigation against auditors…" (Francis 2004). A prerequisite or corequisite of an allegation against an auditor for legally deficient auditing is an allegation against a company and its management for legally deficient financial statements. Thus, Carcello and Palmrose (1994) and Bonner et al. (1998) analyzed a sample of private lawsuits against companies and their management to determine which lawsuits did not include an auditor defendant (metric for stronger auditor monitoring strength because of lower likelihood of audit failure) versus which lawsuits did include an auditor defendant (metric for weaker auditor monitoring strength because of higher likelihood of audit failure).

The concern with this dichotomous litigation measure for auditor monitoring strength is that it incorrectly implies that all occurrences of the auditor being named a defendant in private litigation are equally meaningful measures of lower auditor monitoring strength because of higher likelihood of audit failure. For example, sometimes an auditor is frivolously (nonmeritoriously) named a defendant in private litigation. In contrast, the law of business misconduct literature, and the legal process literature, provide the theory for OUTCOME, a six level hierarchy of increasingly

negative auditor litigation outcomes. Auditor litigation resolutions in this paper are conceptualized as a theoretical continuum ranging from very weak auditor monitoring strength because of a very high likelihood that an audit failure occurred to very strong auditor monitoring strength because of a very low likelihood that an audit failure occurred. The literature discussed below provides the theoretical basis for the six categories of OUTCOME. As a practical matter, use of a six category scale instead of a dichotomous measure greatly diminishes the impact of any frivolous lawsuits on a CPA firm's auditor monitoring strength aggregate measure, without the need for a problematic settlement dollar amount cutoff. This issue was discussed in Section 2.4.

5.2.1. OUTCOME=500: The auditor is or was a defendant in a criminal prosecution

Criminal prosecutions are only by the government and are reserved for the most culpable, harmful and wrongful perpetrators of business misconduct (Green 2006). An individual can be imprisoned only upon criminal conviction. Only a criminal conviction can make a CPA firm felonious, causing an automatic subsequent bar from the auditing profession.

In civil law, the lack of intent does not always exculpate the law violator from liability. Conversely, intent must always be found to be present to secure a criminal conviction. The Securities Exchange Act of 1934 ("Exchange Act") has intent requirements for all actions – criminal, government civil, and private civil – but a more stringent intent requirement for criminal prosecutions: "Any person who *willfully* violates any provision … or any rule or regulation thereunder, shall upon conviction be fined not more than $5,000,000, or imprisoned not more than 20 years, or both…" Section 32(a) of the Exchange Act, 15 USC 78ff (a) (2004) (emphasis added).

Greater evidentiary certainty is required for a criminal conviction than for an imposition of civil liability. For example, in a criminal proceeding the burden of proof is on the state and the proof standard is "beyond a reasonable doubt." In a civil proceeding the burden of proof may sometimes be on the defendant (for example, under the Securities Act of 1933), and the proof standard is merely "a preponderance of the evidence."

5.2.2. OUTCOME=400: The auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit

"White-collar crime" (Sutherland 1940), as understood by sociologists, criminologists, and Sutherland himself (Sutherland 1945), includes not only criminally prosecuted business misconduct, but also other similar deviance. Some argue against treating such business misconduct more leniently than street crime. Some feel that all of it should be criminally prosecuted. Sutherland attributed the fining for white-collar crime, in contrast to the more onerous incarceration for street crime, to the power of the business classes to protect themselves from the full force of the criminal sanctions directed at blue-collar criminals.

Therefore, the next most severe category of auditor legal outcome is the portion of white-collar crime cases that, but for prosecutorial discretion, could possibly be criminally prosecuted. These are the cases in which the government (usually, but not always, the SEC) alleges that the auditor committed fraud. If the government can allege the fraud to have been pursuant to willful intent, then it can undertake a criminal prosecution. In contrast, the government cannot possibly criminally prosecute a nonfraud allegation.

5.2.3. OUTCOME=300: The auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding

Nonfraud government lawsuits and administrative proceedings against auditors are the next step down in severity. They lack the potential to be brought as criminal prosecutions. This distinguishes them from government civil fraud prosecutions. Yet, these are still serious matters, for several reasons. First, this is still an exercise of governmental (federal or state) power with the potential for far more severe consequences than a private civil lawsuit. For example, the SEC has the power under its Rule 102(e) to bar an auditor from any future auditing of SEC registrants, even for a nonfraud infraction. Additionally, alleged lying, document destruction, or other obstruction of justice, during the course of an SEC investigation, can be grounds for a Justice Department criminal prosecution.

Nonfraud government lawsuits and administrative proceedings against auditors can also be regarded as somewhat severe outcomes because of the selective prosecution necessitated by the inadequate funding of the SEC during the period of this study. This caused inadequate staffing of sufficiently experienced lawyers, accountants, and examiners, as well as inadequate technology and security (Seligman 2003; Maremont and Solomon 2003; and Grundfest 2002). The consequence of these inadequacies is that the SEC enforcement division was forced to settle some cases on terms more lenient to the defendants than the facts and circumstances warranted and simply decline to bring cases at all if they were not relatively egregious and thus relatively easy to win.

5.2.4. Private actions: OUTCOME=200, 100 or 0

In the United States and Canada, private actions, especially private securities class actions, comprise the bulk of the economically significant litigation against auditors. There are two reasons for the prevalence of private actions, compared to criminal court actions, government civil court actions and administrative proceedings. First, private sector attorneys are motivated by economic self-interest to bring private actions on behalf of shareholders and creditors who allege they have been wronged. Private sector attorneys are awarded an average of twenty-five percent of the settlement, contingent on one being obtained, as compensation for their labor and risk-taking (Eisenberg and Miller 2004). Second, as discussed above, government entities, including both the Justice Department and the SEC, refrain from prosecuting all meritorious cases. This prosecutorial discretion necessitates a partial reliance upon the private sector for enforcement of the securities laws related to financial reporting.

With regard to private actions, the legal process literature (also called the suit, settlement and trial literature) suggests that there are meaningful (auditor monitoring strength-indicative) distinctions among the various possible outcomes within private actions (Shavell 1982; Cooter and Rubinfeld 1989; Hay and Spier 1997). A private legal dispute has sequential stages. Two parties have a dispute. One (called the plaintiff, or, in the context of this paper, the plaintiff class of investors or creditors who were users of the company's financial reporting) demands money from the other (called the defendant or defendants). In the next stage, the plaintiff files a lawsuit against the defendant or defendants. In the context of this paper, the plaintiff class typically does not immediately file a lawsuit against the auditor but waits six months to a year to decide. In the next

stage, the plaintiff files an additional complaint or an amended complaint adding the auditor as a defendant.

The remaining stages vary, depending upon whether the case is dismissed. If the case is dismissed, the plaintiffs appeal. If the case is not dismissed, a trial is held. The loser of the trial appeals the verdict.

At each stage, decisions are made by the litigants on the basis of economic self-interest. Each litigant decides whether, and on what terms, to settle, based on her estimate of the expected value (the likelihood of prevailing and the estimate of the recovery form this expectation) of the legal claim, net of the expected costs of continuing the litigation. Agency problems, risk aversion, strategic bargaining, and other problems complicate but do not defeat the use of the legal economics theory to make auditor monitoring strength conclusions, depending upon how severe was the outcome for the auditor.

Among the private action outcomes, the most severe outcome is if the auditor has to pay the plaintiffs in order to settle the private action (= 200 = auditor paid to settle a private action). The next most severe outcome is if the auditor is simply named a defendant (= 100 = auditor is or was a defendant in a private action). The best outcome for the auditor is if the auditor is never named a defendant (= 0 = auditor was never a defendant in a private action).

5.3. The explanatory variables

In Table 1 are the results of prior studies which analyzed a sample of financial reporting lawsuits to determine which had no auditor defendants and which did have an auditor defendant. Most variables that were insignificant in all prior studies (for example,

whether the company was publicly held, whether the company was traded on the New York Stock Exchange, whether there was an IPO, whether the company was in the financial services sector, the financial condition of the company, and the stock market price decline) were not included in the model. Five variables have been found significant in at least 80% of these studies. Thus, these arguably should be included in the cumulative logit model. However, the presence of an Accounting and Auditing Enforcement Release naming management or the auditor a defendant or respondent ("AAER" in Table 1) is already incorporated into OUTCOME. Similarly, the presence of an Accounting and Auditing Enforcement Release naming the auditor a defendant or respondent ("A" in Table 1) is also already incorporated into OUTCOME.

A third characteristic, the restatement of annual audited financial statements ("REY" in Table 1), is also unsuitable for inclusion in the multiple logistic regression model. Restatements of previously issued financial statements have been asserted by Kinney, et al. (2004), Eisenberg and Macey (2004), and others, to measure a component of the same global construct (auditor quality) that OUTCOME measures. A fourth characteristic, the class period of the alleged financial reporting deficiency[4] ("CLA" in Table 1), is also unsuitable for inclusion in the cumulative logit model. The class period of alleged financial reporting deficiency, is an alternative measure of auditor monitoring strength. The longer the period during which the auditor failed to detect and report the

[4] Bonner et al. (1998) decomposed class period into a) whether annual financial statements were alleged by the SEC to be misstated and b) the number of years annual financial statements were alleged by the SEC to be misstated. Their sample was entirely observations where the SEC issued an AAER. They then determined which of those observations had a private litigation. Finally, they determined which of the private litigations had no auditor defendant and which of the private litigations had an auditor defendant. This kind of decomposition of class period is impracticable in a comprehensive sample of private litigation occurrences because many of the litigation documents (complaints) specify the beginning date and ending date of the class period of alleged financial misreporting without specifying whether this was financial misreporting that included the annual financial statements, or just quarterly financial statements, or just press releases and announcements, etc.

misstated financials, the weaker the auditor monitoring strength, by this measure. "A fraud of this duration... [nearly fifteen years] could not have occurred without Arthur Andersen knowingly or recklessly ignoring the repeated warnings, or "red flags" uncovered during its audits" (Baptist Foundation of Arizona 2001).

BANKRUPTCY has been found significant in all prior studies differentiating lawsuits with auditor defendants from lawsuits without auditor defendants. It also was found significant in Bonner, et al. (1998), which differentiated between AAER-related lawsuits with auditor defendants and those without auditor defendants. Thus, it is used as a control variable in this study's model.

Jones and Weingram (1996) provided evidence that companies in the high technology sector experienced more financial reporting litigation. They showed that this is explained, in a regression sense, by the sector's relatively high estimated cumulative turnover of shares traded (which can lead to relatively high estimated shareholder damages and concomitant settlements). High estimated cumulative turnover of shares traded seems completely unrelated to auditor monitoring strength. Thus, it seems intuitive that auditors of industry sectors with relatively high estimated cumulative turnover of shares traded, if their auditees are sued, are less likely, ceteris paribus, to also themselves be named defendants.

As indicated in Table 1, two prior studies did not find high technology to be significant. However, since companies often change their SIC codes, and different researchers define membership in a high technology industry differently,[5] this

[5] In this study, three different cumulative logit models use three different versions of a high technology industry index. Alternatively, decomposition by using indicator variables for the 1000's SIC, the 2000's SIC, the 3000's SIC, etc., was attempted but found to be impracticable due to multicollinearity, even when the indicator variable for the 1000's SIC was dropped from the model.

characteristic seems to merit further examination. HIGHTECH in this study is a company whose primary SIC code meets the American Electronics Association high technology industry definition (AEA 2002).[6]

TOTALASSETS is also used as a control variable. TOTALASSETS may differentiate between the governmental civil prosecutions, which are levels 300 and 400 of OUTCOME, and the less severe levels of OUTCOME, based on the findings of Beasley et al. (1999, 2000). In their sample of AAERs, company size appeared negatively associated with inclusion of the auditor as an SEC defendant. TOTALASSETS, consistent with prior litigation research, is measured as the natural log of a company's total assets, in thousands of US dollars.

With regard to their accounting, non-US companies tend to use the more principles-based financial reporting of the International Financial Reporting Standards ("IFRS") issued by the International Accounting Standards Board, rather than the US GAAP of the Financial Accounting Standards Board. Also, as Coffee (2006) describes, the typical non-US company is characterized by relatively less dispersed share ownership. The risk of fraud is likely to be majority shareholder extraction of private benefits ("tunneling") at the expense of the minority shareholders, rather than managerial manipulation of financial reporting at the expense of all of the shareholders. Also, the auditor is likely to be less independent, in terms of requiring disclosure of any activities that are unfair to minority shareholders, since the board of directors may well be a conduit for the majority shareholder to oppress the minority shareholders. In other words, the fraud the auditor needs to prevent, as well as the corporate governance

[6] SIC codes 3571, 3572, 3575, 3577-79, 3651, 3652, 3661, 3663, 3669, 3671, 3672, 3674-3679, 3812, 3821-27, 3829, 3844, 3845, 3861, 4812, 4813, 4822, 4841, 4899, 7371-79.

environment influencing the independence of the auditor, may be different in a non-US company. US is a company whose principal executive office is listed on its SEC Form 10K or 20F as located in the United States.

6. The empirical results

The far left column of Table 3 lists the six levels of auditor litigation outcomes. The best outcome, in terms of likelihood of audit failure and suggested auditor monitoring strength, is 0. This is when the auditor was not even named a defendant in the private litigation. This was by far the most frequent outcome for the auditor, in 78.37% of the 1,008 lawsuits. Among the auditors, PricewaterhouseCoopers and Ernst & Young were the best in regard to their frequency of lawsuits in which they were not even named a defendant, at 81.58% and 81.25%, respectively. Arthur Andersen and Deloitte & Touche were the worst in regard to their frequency of lawsuits in which they were not even named a defendant, at 72.56% and 73.03%, respectively.

The worst outcome, in terms of likelihood of audit failure and suggested auditor monitoring strenth, is 500. This is when the auditor was criminally prosecuted. This was the least frequent outcome for the auditor, in .6% of the 1008 lawsuits. Arthur Andersen was the worst in regard to its frequency of lawsuits in which it was, in related criminal proceedings, prosecuted, at 1.83%. There were few (six in the 1999-2004 period) criminal prosecutions of auditors. Enron/Andersen was one of three cases where the CPA firm, in addition to its personnel, was prosecuted. The other Arthur Andersen prosecutions were American Tissue and Peregrine Systems. In NextCard, an Ernst & Young partner pled guilty. In Parmalat, two Deloitte & Touche partners, as well as the

CPA firm, were indicted in Italy. In Finance Credit, a KPMG partner and the CPA firm were criminally prosecuted in Norway.

In terms of mean scores, the best auditor litigation outcome, likelihood of audit failure, and suggested auditor monitoring strength, was Ernst & Young (27.92), followed by PricewaterhouseCoopers (31.58), KPMG (35.48), and Deloitte & Touche (48.68). The worst auditor was Arthur Andersen (54.27). These are descriptive statistics. The hypothesis testing relies on a cumulative logit model, a rigorous mode of analysis.

Additional descriptive statistics, similar to those in Palmrose (1988), are found at the bottom of Table 2. Using millions of auditee sales dollars to scale the number of times the auditor was named a defendant (OUTCOME of 100, 200, 300, 400 or 500), PricewaterhouseCoopers had the lowest litigation percentage and by inference the strongest auditor monitoring strength. Arthur Andersen had the highest litigation percentage and by inference the weakest auditor monitoring strength. Using number of auditees to scale the number of times the auditor was named a defendant, KPMG had the lowest litigation percentage and by inference the strongest auditor monitoring strength. Deloitte & Touche had the highest litigation percentage and by inference the weakest auditor monitoring strength. In the composite rankings, PricewaterhouseCoopers had the strongest auditor monitoring strength and Arthur Andersen the weakest auditor monitoring strength.

Data on each CPA firm's auditee SIC codes are shown in Table 4. Some of the CPA firms have a concentration in certain industry sectors. For example, Arthur Andersen, compared to the other CPA firms, had the highest percentage of its auditees, and the largest number of auditees, in the Transportation, Communications and Utilities

sector. Ernst & Young has the highest percentage of its auditees, and the largest number of auditees, in the Retail Trade sector, as well as the Finance, Insurance and Real Estate sector. PricewaterhouseCoopers has the highest percentage of its auditees, and the largest number of auditees, in the Manufacturing sector.

In Table 5, auditee nationalities are shown. Arthur Andersen had the highest percentage (93.29%), and Deloitte & Touche the lowest percentage (88.2%), of US auditees. The 17 Canadian companies are fairly evenly distributed. PricewaterhouseCoopers has half of the 12 Bermuda companies as audit clients. Ernst & Young has 80% of the 10 Israeli companies. PricewaterhouseCoopers' results were hurt by one of its Bermuda auditees (Tyco, with an OUTCOME = 400) but helped by the rest of them. Ernst & Young's results were helped by its 8 Israeli auditees, with an OUTCOME = 0 on each observation.

Statistics on control variables BANKRUPTCY, HIGHTECH, and TOTALASSETS, are shown in Table 6. The percentage of auditees that filed for bankruptcy ranged from 10% (Ernst & Young) to 17.68% (Arthur Andersen). The percentage of high technology industry auditees ranged from 30.26% (Deloitte & Touche) to 37.8% (Arthur Andersen). The auditee mean total assets ranged from $6,218,616,000 (Ernst & Young) to $18,092,380,000 (KPMG).

Table 7 presents the results of the cumulative logit (proportional odds) six category model. The results support the first hypothesis. PricewaterhouseCoopers has a significant (p=.0167), negative association, with OUTCOME. Since OUTCOME is scaled such that a lower score occurs when a more positive outcome for the auditor in the litigation occurs, this suggests that PricewaterhouseCoopers provides stronger auditor

monitoring strength. The results also support the second hypothesis. Ernst & Young has a significant (p=.0479), negative association, with OUTCOME. Control variables BANKRUPT, HITECH, and TOTALASSETS are each significant at a five percent level, but US is not. Like PricewaterhouseCoopers and Ernst & Young, the other two Big 4 CPA firms have negative associations with OUTCOME, but the associations are not significant. Based on the likelihood ratio statistic, the model is significant at p=.0001, and the adjusted pseudo R^2 for the model is p=.081.

Table 8 presents the results of the cumulative logit five category model. The results again support both hypotheses. PricewaterhouseCoopers has a significant (p=.0172), negative association, with OUTCOME. Ernst & Young has a significant (p=.0487), negative association, with OUTCOME. Control variables BANKRUPT, HITECH, and TOTALASSETS are each significant at a five percent level, but US is not. Like PricewaterhouseCoopers and Ernst & Young, Deloitte & Touche and KPMG have negative associations with OUTCOME, but the associations are not significant. Based on the likelihood ratio statistic, the model is significant at p=.0001, and the adjusted pseudo R^2 for the model is p=.0812.

Table 9 presents the results of the cumulative logit four category model. The results support the first hypothesis. PricewaterhouseCoopers has a significant (p=.0196), negative association, with OUTCOME. The results do not support the second hypothesis. Ernst & Young has a negative association with OUTCOME but the association is not significant at a five percent level. Control variables BANKRUPT, HITECH, and TOTALASSETS are each significant at a five percent level, but US is not. The other two Big 4 CPA firms have negative associations with OUTCOME, but the

associations are not significant. Based on the likelihood ratio statistic, the model is significant at p=.0001, and the adjusted pseudo R^2 for the model is p=.0816.

Table 10 presents the results of the cumulative logit six category model with HITECHB (Bonner et al. 1998 high technology industry sector)[7] substituted for HITECH (AEA 2002 high technology industry sector). The results support both hypotheses. PricewaterhouseCoopers has a significant (p=.0173), negative association, with OUTCOME. Ernst & Young has a significant (p=.0500), negative association, with OUTCOME. Control variables BANKRUPT and TOTALASSETS are each significant at a five percent level, but HITECHB and US are not. Like PricewaterhouseCoopers and Ernst & Young, Deloitte & Touche and KPMG have negative associations with OUTCOME, but the associations are not significant. Based on the likelihood ratio statistic, the model is significant at p=.0001, and the adjusted pseudo R^2 for the model is p=.0761.

Table 11 presents the results of the cumulative logit six category model with HITECHJ (Jones et al. 1996 high technology industry sector)[8] substituted for HITECH (AEA 2002 high technology industry sector). The results support the first hypothesis. PricewaterhouseCoopers has a significant (p=.0244), negative association, with OUTCOME. The results do not support the second hypothesis. Ernst & Young has a negative association with OUTCOME but the association is not significant at a five percent level. Control variables BANKRUPT, TOTALASSETS, and HITECHJ are each significant at a five percent level, but US is not. Like PricewaterhouseCoopers and Ernst & Young, Deloitte & Touche and KPMG have negative associations with OUTCOME,

[7] SIC codes 3570-3579, 7370-7379.
[8] SIC codes 2830-2839, 3570-3579, 3670-3679, 3825-3849, 7370-7379, and 8730-8739.

but the associations are not significant. Based on the likelihood ratio statistic, the model is significant at p=.0001, and the adjusted pseudo R^2 for the model is p=.0841.

Across the five variations of the cumulative logit (proportional odds) model, there is consistent support for the first hypothesis. The better auditor litigation outcomes for PricewaterhouseCoopers suggest that it provides stronger auditor monitoring strength. There is also consistency in regard to some of the other results. Deloitte & Touche and KPMG are negatively associated with OUTCOME, but not significantly. There is significance for control variables BANKRUPT and TOTALASSETS, but not US. The two largest correlation coefficients (not shown in a table) are on the relationship between HITECH and TOTALASSETS (*r*=-0.20, p=.0001),[9] and between TOTALASSETS and US (*r*=-0.15, p=.0001). In none of the variations of the model does any variance inflation factor (not shown in a table) exceed 2.0. In none of them does the condition number (not shown in a table) exceed 2.7. Since the respective relevant thresholds of 5 and 30 are not exceeded, this suggests that multicollinearity is not a problem (Judge, et al. 1988, pp. 868-871).

7. Conclusions

The PricewaterhouseCoopers hypothesis is supported. PricewaterhouseCoopers had relatively better auditor litigation outcomes than the other members of the Big 4. The results are insensitive to the choice of number of litigation outcome categories or the choice of high technology industry sector definition. Thus, the results are robust. This suggests that PricewaterhouseCoopers provides stronger auditor monitoring strength,

[9] When HITECHB was substituted for HITECH, the correlation coefficient increased to -.26. When HITECHJ was substituted for HITECH, the correlation coefficient increased to -.31.

compared to the other Big 4 CPA firms. This is consistent with some prior empirical research.

The auditor litigation outcomes of Ernst & Young, in multivariate analysis, are sensitive to the choice of number of litigation outcome categories. They are also sensitive to the choice of high technology industry sector definition. Thus, the findings are not robust with regard to Ernst & Young.

8. Limitations and suggestions for future research

The structure of the research reported in this paper implies that a given CPA firm will provide a firm-wide level of auditor monitoring strength. Yet, there is evidence that suggests indirectly via proxies for auditor reputation, financial statements information credibility, and financial statements information quality, that there may be significant variations of auditor monitoring strength in terms of industry specialization (Craswell et al. 1995; Krishnan (2003); and Balsam et al 2003). Also, there is some evidence that similarly suggests that auditor monitoring strength may vary from one office (city) to another, within a specific CPA firm (Francis 2004).

The results of the research reported in this paper have been interpreted as suggesting that, for example, PricewaterhouseCoopers provides stronger auditor monitoring strength, compared to the other members of the Big 4. However, despite the use of a research design that avoids the use of litigation nonoccurrence data (and thus avoids conflating auditor quality and financial reporting quality), this interpretation may still be too strong. This interpretation assumes that each of the Big 4 has a similar client risk management strategy. In the real world, this assumption must be relaxed. For example, one of the Big 4 may decide to not accept, or to not retain, highly risky clients

that other members of the Big 4 may decide to accept or retain. Ceteris paribus, such a CPA firm will appear to provide stronger auditor monitoring strength than it would if all of the members of the Big 4 had an identical client risk strategy.

Conversely, one of the Big 4 may decide to accept or retain highly risky clients rejected by the other members of the Big 4. Ceteris paribus, such a CPA firm will appear to provide weaker auditor monitoring strength than it would if all of the members of the Big 4 had an identical client risk strategy. The point is, a rational client risk management strategy is not confined to responding to assessed high client risk only by devoting more hours and/or more experienced auditors to the audit engagement and charging a higher fee. Client acceptance and retention practices are also important components of client risk management (Johnstone and Bedard 2003).

Regardless whether PricewaterhouseCoopers provides stronger auditor monitoring strength or merely appears to have greater auditor monitoring strength due to a comparatively greater propensity to reject highly risky clients, this is useful information for users of audited financial statements. PricewaterhouseCoopers auditor litigation outcomes are comparatively better than the other Big 4 CPA firms. Thus, ceteris paribus, it is less risky to invest in, lend to, or extend credit to, companies whose financial statements are audited by PricewaterhouseCoopers. This is partly because larger settlements of securities lawsuits are associated with more negative auditor litigation outcomes, and larger settlements are positively associated with larger damages experienced by the investor class of shareholders. Also, since settlement amounts are

typically paltry compared to damages suffered, the larger settlements do not significantly mitigate the larger damages experienced by the investor class of shareholders.[10]

Litigation often occurs several years after the audit. These conclusions concerning differences in auditor monitoring strength among the largest CPA firms are based on litigation commenced 1999-2004. The related audits were performed beginning approximately 1996 or 1997, and ending approximately 2001 or 2002. Analysis of more recent data will have to be done in the future, due to the length of time it takes for the outcome of auditor litigation to be decided. Audit committees, shareholders, and other stakeholders who depend on financial reporting or who are interested in comparative auditor monitoring strength as a matter of public policy, obviously would prefer information based on current audit engagements, concerning the relative auditor monitoring strength of the largest CPA firms in the large public company auditing services market. The most practicable response is for researchers to periodically reperform this study to provide updated information on comparative auditor monitoring strength.

[10] In 2006, the presence of the auditor as a settling defendant doubled the aggregate (from all defendants) private securities class action settlement amount. The aggregate settlement was 2.2% of alleged investor losses (Foster et al. 2007).

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Table 1: Variables in Prior Research re Lawsuits with Auditor Defendants vs. Lawsuits without Auditor Defendants

Variable/Study	AAER	A	IPO	REQ	REY	BAN	BIG	CLA	TA	HT	F	P	NYSE	D	Z
Studies of comprehensive samples of financial reporting lawsuits															
Fuerman (1996)	NS	NT	NS	NT	S	S	NS	S	NS	NS	NT	NT	NT	NT	NT
Fuerman (1997a)	NT	NT	NT	NT	S	S	NT	S	NT	NT	NT	NT	NT	NT	NT
Fuerman (1997b)	S	S	NT	NT	S	S	NT	S	NT	NT	NT	NT	NT	NT	NT
Fuerman (1998)	NT	NT	NT	NT	S	S	NT	S	NT	NT	NT	NT	NT	NT	NT
Fuerman (1999)	S	S	NT	NS	S	S	NT	S	NT	NT	NT	NT	NT	NT	NT
Fuerman (2000)	S	NT	NT	NT	S	S	S	S	NS	NT	NT	NT	NT	NT	NT
Study limited to fraudulent annual financial statements-related lawsuits															
Freund, et al. (2002)	NT	NT	NS	NT	NS	S	NS	NS	NS	NT	NT	NT	NT	NS	NT
Study limited to bankruptcy-related lawsuits															
Carcello & Palmrose (1994)	S	NT	NT	NT	NT	NT	NT	NT	NS	NT	NT	NT	NT	NT	NS
Study limited to AAER-related lawsuits															
Bonner, et al. (1998)	NT	S	NS	NT	NT	S	NS	S/NS	NS	NS	NS	NS	NS	NT	NT
% Significant	80%	100%	0%	0%	100%	100%	25%	86%	0%	0%	0%	0%	0%	0%	0%

S (NS) means that a variable was (was not) found significant at p<.05 in univariate and multivariate hypothesis testing
NT means a variable was not tested
AAER = Accounting and Auditing Enforcement Release naming management or auditor a defendant or respondent
A = Accounting and Auditing Enforcement Release naming auditor a defendant or respondent
IPO = Initial public offering used the financial statements
REQ = Quarterly unaudited financial statements (but not annual audited financial statements) were restated
REY = Annual audited financial statements were restated
BAN = Company bankruptcy filing within a year before or after lawsuit filing
BIG = Big 8, 6 or 5 auditor
CLA = Class period of alleged financial reporting deficiency
TA = Natural log of company total assets
HT = Company member of high technology industry sector
F = Financial services industry sector
P = Public company
NYSE = New York Stock Exchange listed company
D = Estimated damages to the plaintiff class of stockholders computed with Dyl's (1999) proportional decay model
Z = ZFC/Sinkey, an estimate of Zmijewski's (1984) financial condition index or the Sinkey et al. (1987) financial condition index

Table 2: Sales Dollars Audited, Auditees, Auditor Litigations per Sales Dollar Audited, and Auditor Litigations per Auditee

	Sales$	Auditees	Sales$	Auditees	Sales$	Auditees	Sales$	Auditees	Sales$	Auditees
	Audited		Audited		Audited		Audited		Audited	
	AA	AA	DT	DT	EY	EY	KPMG	KPMG	PwC	PwC
June 96	913512	1505	1101558	*1238*	1218238	1626	*831907*	1571	**1981633**	**1943**
Dec 96	959202	1535	1112049	*1190*	1249189	1651	*839477*	1548	**2014902**	**1930**
June 97	1015758	1537	1138448	*1221*	1276147	1640	*863938*	1528	**2099916**	**1883**
Dec 97	1035643	1561	1145480	*1161*	1294427	1625	*903963*	1522	**2101580**	**1837**
June 98	1109012	1596	1183829	*1212*	1370015	1653	*933854*	1531	**2195908**	**1850**
Dec 98	1109234	1575	1163724	*1173*	1290897	1643	*910499*	1471	**2164954**	**1814**
June 99	1103341	1600	1224160	*1159*	1289395	1656	*944436*	1462	**2242982**	**1795**
Dec 99	1184681	1620	1313447	*1231*	1333746	1701	*972854*	1463	**2222619**	**1846**
June 00	1193170	1496	1361053	*1146*	1379156	1604	*998677*	1358	**2320658**	**1688**
Dec 00	1230192	1448	1361743	*1091*	1448451	1574	*1004408*	1325	**2285242**	**1617**
June 01	1312889	1404	1570262	*1070*	1575118	**1535**	*1106533*	1285	**2357708**	1518
Dec 01	1356242	1377	1549546	*1045*	1586412	**1513**	*1112644*	1251	**2375864**	1455
Average	1126906	1521	1268775	*1161*	1359266	1618	*951933*	1443	**2196997**	**1765**
Aud lits	45	45	41	41	45	45	38	38	49	49
Auditor lits/avg	0.003993%	2.958%	0.003231%	3.530%	0.003311%	2.780%	0.003992%	2.634%	0.002230%	2.777%
Rank	5	4	2	5	3	3	4	1	1	2
Composite	4.5	4.5	3.5	3.5	3	3	2.5	2.5	1.5	1.5

Table 3: Outcomes for the Auditor in Litigation 1999-2004, n=1,008

OUTCOME	AA	DT	EY	KPMG	PwC	Total
0	119	111	195	148	217	790
	72.56%	73.03%	81.25%	79.57%	81.58%	78.37%
100	19	16	31	19	25	110
	11.59%	10.53%	12.92%	10.22%	9.4%	10.91%
200	17	19	10	13	15	74
	10.37%	12.5%	4.17%	6.99%	5.64%	7.34%
300	3	5	1	4	7	20
	1.83%	3.29%	.42%	2.2%	2.63%	1.98%
400	3	0	2	1	2	8
	1.83%	0%	.83%	.54%	.75%	.79%
500	3	1	1	1	0	6
	1.83%	.66%	.42%	.54%	0%	.6%
Total	164	152	240	186	266	1,008
	100%	100%	100%	100%	100%	100%
Mean	54.27	48.68	27.92	35.48	31.58	37.7
Rank	Fifth (worst)	Fourth	First (best)	Third	Second	

OUTCOME	The lower the OUTCOME score, the higher the auditor quality
0	Auditor was never a defendant in a private litigation
100	Auditor is or was a defendant in a private litigation
200	Auditor paid to settle a private litigation
300	Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding
400	Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit
500	Auditor is or was a defendant in a criminal prosecution

Table 4: Auditee SIC Codes 1999-2004, n=1,008

SIC	AA	DT	EY	KPMG	PwC	Total
Mineral Industries	6	2	6	2	4	20
1000-1999	3.66%	1.32%	2.5%	1.08%	1.5%	1.98%
Construction Industries	14	29	35	20	40	138
2000-2999	8.54%	19.08%	14.58%	10.75%	15.04%	13.69%
Manufacturing	29	34	46	47	70	226
3000-3999	17.68%	22.37%	19.17%	25.27%	26.32%	22.42%
Transportation, Communications and Utilities	34	19	15	14	32	114
4000-4999	20.73%	12.5%	6.25%	7.53%	12.03%	11.31%
Wholesale Trade	21	14	23	24	20	102
5000-5999	12.8%	9.21%	9.58%	12.9%	7.52%	10.12%
Retail Trade	8	19	33	21	31	112
6000-6999	4.88%	12.5%	13.75%	11.29%	11.65%	11.11%
Finance, Insurance and Real Estate	43	30	65	41	54	233
7000-7999	26.22%	19.74%	27.08%	22.04%	20.3%	23.12%
Service Industries	9	5	17	17	15	63
8000-8999	5.49%	3.29%	7.08%	9.14%	5.64%	6.25%
Total	164	152	240	186	266	1,008
	100%	100%	100%	100%	100%	100%

Table 5: Auditee Nationality 1999-2004, n=1,008

Nationality	AA	DT	EY	KPMG	PwC	Total
Bermuda	2	2	1	1	6	12
	1.22%	1.32%	.42%	.54%	2.26%	1.19%
Canada	0	4	4	5	4	17
	0%	2.63%	1.67%	2.69%	1.5%	1.69%
China	1	2	0	0	2	5
	.61%	1.32%	0%	0%	.75%	.5%
France	2	0	2	0	0	4
	1.22%	0%	.83%	0%	0%	.4%
Germany	1	0	0	1	3	5
	.61%	0%	0%	.54%	1.13%	.5%
Israel	0	1	8	1	0	10
	0%	.66%	3.33%	.54%	0%	.99%
Netherlands	1	1	1	1	1	5
	.61%	.66%	.42%	.54%	.38%	.5%
Other	3	5	2	6	10	26
	1.83%	3.29%	.83%	3.23%	3.76%	2.58%
UK	1	2	0	2	2	7
	.61%	1.32%	0%	1.08%	.75%	.69%
US	153	135	222	169	238	917
	93.29%	88.82%	92.5%	90.86%	89.47%	90.97%
Total	164	152	240	186	266	1,008
	100%	100%	100%	100%	100%	100%

Auditee nationality is defined by the corporation's principal executive office. Aggregate results using corporation's domicile of incorporation are almost identical.

Table 6: Auditee Bankruptcy, High Technology Industry, and Total Assets 1999-2004, n=1,008

	AA	DT	EY	KPMG	PwC	Total
BANKRUPTCY	29	25	24	23	29	130
Percent	17.68%	16.45%	10%	12.37%	10.9%	12.9%
Standard Deviation	.3827	.3719	.3006	.3301	.3123	.3353
HIGHTECH	62	46	85	62	97	352
Percent	37.8%	30.26%	35.42%	33.33%	36.47%	34.92%
Standard Deviation	.4864	.4609	.4793	.4727	.4822	.477
TOTALASSETS						
Mean	10888409	12152159	6218616	18092380	15268712	12452336
Median	481322	505617	413463	502698	753840	577961
Standard Deviation	55570683	43651865	23906381	109012808	66112418	65362983

BANKRUPT	1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise
HIGHTECH	1= high technology industry SIC as defined by American Electronics Association; 0 = otherwise
TOTALASSETS	Auditee total assets in thousands of US dollars

Table 7: Polytomous Regression Results 1999-2004, n=1,008, Six Category Cumulative Logit (Proportional Odds) Model

Explanatory Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Two Sided Prob. Value
Intercept1	-6.4469	.7406	75.785	.0001
Intercept2	-5.5811	.6732	68.7322	.0001
Intercept3	-4.6633	.6412	52.8943	.0001
Intercept4	-3.3924	.6239	29.5681	.0001
Intercept5	-2.5097	.6183	16.4771	.0001
DT	-.0675	.2544	.0704	.7907
EY	-.485	.2451	3.9151	.0479
KPMG	-.3881	.2548	2.3202	.1277
PwC	-.574	.2399	5.7271	.0167
BANKRUPT	1.221	.1936	39.7883	.0001
HITECH	-.393	.1758	4.9961	.0254
TOTALASSETS	.1199	.0353	11.5528	.0007
US	-.1799	.2605	.477	.4898
OUTCOME = The lower the OUTCOME score, the higher the auditor quality (six category response variable)				
0 = Auditor was never a defendant in private litigation				
100 = Auditor is or was a defendant in private litigation				
200 = Auditor paid to settle private litigation				
300 = Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding				
400 = Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit				
500 = Auditor is or was a defendant in a criminal prosecution				
DT = Deloitte & Touche; 0 = Otherwise				
EY = Ernst & Young; 0 = Otherwise				
KPMG = KPMG; 0 = Otherwise				
PwC = PricewaterhouseCoopers; 0 = Otherwise				
BANKRUPT = 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise				
HITECH = 1 = high technology industry SIC as defined by American Electronics Association; 0 = otherwise				
TOTALASSETS = Auditee total assets in thousands of US dollars (natural log used for regression)				
US = 1 = US auditee; 0 = otherwise. Auditee nationality is defined by the corporation's principal executive office.				
Chi-Square Statistic for the Proportional Odds Assumption (32 degrees of freedom): 129 (prob. value .0001)				
Deviance Goodness of Fit Statistic, 5017 degrees of freedom: 1488 (prob. value .9999)				
Pearson Goodness of Fit Statistic, 5017 degrees of freedom: 4803 (prob. value .9848)				
Likelihood Ratio Statistic for Model, excluding intercepts, 8 degrees of freedom: 66 (prob. value .0001)				
Pseudo R squared: .0637; Adjusted pseudo R squared: .081				

Table 8: Polytomous Regression Results 1999-2004, n=1,008, Five Category Cumulative Logit (Proportional Odds) Model

Explanatory Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Two Sided Prob. Value
Intercept1	-5.5891	.6737	68.8347	.0001
Intercept2	-4.667	.6413	52.9552	.0001
Intercept3	-3.3943	.624	29.5918	.0001
Intercept4	-2.5112	.6184	16.493	.0001
DT	-.0668	.2544	.0688	.793
EY	-.4832	.2452	3.8844	.0487
KPMG	-.3867	.2548	2.3029	.1291
PwC	-.5716	.2399	5.6788	.0172
BANKRUPT	1.2169	.1936	39.492	.0001
HITECH	-.3924	.1758	4.9827	.0256
TOTALASSETS	.1198	.0353	11.5224	.0007
US	-.177	.2607	.4613	.497
OUTCOME = The lower the OUTCOME score, the higher the auditor quality (six category response variable)				
0 = Auditor was never a defendant in private litigation				
100 = Auditor is or was a defendant in private litigation				
200 = Auditor paid to settle private litigation				
300 = Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding				
400 = Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit				
500 = Auditor is or was a defendant in a criminal prosecution				
DT = Deloitte & Touche; 0 = Otherwise				
EY = Ernst & Young; 0 = Otherwise				
KPMG = KPMG; 0 = Otherwise				
PwC = PricewaterhouseCoopers; 0 = Otherwise				
BANKRUPT = 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise				
HITECH = 1 = high technology industry SIC as defined by American Electronics Association; 0 = otherwise				
TOTALASSETS = Auditee total assets in thousands of US dollars (natural log used for regression)				
US = 1 = US auditee; 0 = otherwise. Auditee nationality is defined by the corporation's principal executive office.				
Chi-Square Statistic for the Proportional Odds Assumption (24 degrees of freedom): 39 (prob. value .0273)				
Deviance Goodness of Fit Statistic, 4012 degrees of freedom: 1469 (prob. value .9999)				
Pearson Goodness of Fit Statistic, 4012 degrees of freedom: 4110 (prob. value .1382)				
Likelihood Ratio Statistic for Model, excluding intercepts, 8 degrees of freedom: 66 (prob. value .0001)				
Pseudo R squared: .0635; Adjusted pseudo R squared: .0812				

Table 9: Polytomous Regression Results 1999-2004, n=1,008, Four Category Cumulative Logit (Proportional Odds) Model

Explanatory Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Two Sided Prob. Value
Intercept1	-4.6802	.6418	53.1732	.0001
Intercept2	-3.4031	.6243	29.7128	.0001
Intercept3	-2.5194	.6187	16.582	.0001
DT	-.0543	.2546	.0455	.831
EY	-.4758	.2454	3.758	.0526
KPMG	-.3779	.255	2.1958	.1384
PwC	-.5604	.24	5.4511	.0196
BANKRUPT	1.2108	.1938	39.0503	.0001
HITECH	-.3896	.1758	4.9133	.0267
TOTALASSETS	.1192	.0353	11.42	.0007
US	-.1695	.261	.4219	.516
OUTCOME = The lower the OUTCOME score, the higher the auditor quality (six category response variable)				
0 = Auditor was never a defendant in private litigation				
100 = Auditor is or was a defendant in private litigation				
200 = Auditor paid to settle private litigation				
300 = Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding				
400 = Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit				
500 = Auditor is or was a defendant in a criminal prosecution				
DT = Deloitte & Touche; 0 = Otherwise				
EY = Ernst & Young; 0 = Otherwise				
KPMG = KPMG; 0 = Otherwise				
PwC = PricewaterhouseCoopers; 0 = Otherwise				
BANKRUPT = 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise				
HITECH = 1 = high technology industry SIC as defined by American Electronics Association; 0 = otherwise				
TOTALASSETS = Auditee total assets in thousands of US dollars (natural log used for regression)				
US = 1 = US auditee; 0 = otherwise. Auditee nationality is defined by the corporation's principal executive office.				
Chi-Square Statistic for the Proportional Odds Assumption (16 degrees of freedom): 12 (prob. value .7154)				
Deviance Goodness of Fit Statistic, 3007 degrees of freedom: 1424 (prob. value .9999)				
Pearson Goodness of Fit Statistic, 3007 degrees of freedom: 3117 (prob. value .0789)				
Likelihood Ratio Statistic for Model, excluding intercepts, 8 degrees of freedom: 66 (prob. value .0001)				
Pseudo R squared: .063; Adjusted pseudo R squared: .0816				

Table 10: Polytomous Regression Results 1999-2004, n=1,008, Six Category Cumulative Logit (Proportional Odds) Model With Bonner et al. (1998) High Technology Variable

Explanatory Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Two Sided Prob. Value
Intercept1	-6.6718	.7409	81.0985	.0001
Intercept2	-5.8071	.6736	74.3225	.0001
Intercept3	-4.8892	.6415	58.0822	.0001
Intercept4	-3.6192	.624	33.6383	.0001
Intercept5	-2.7398	.6181	19.6469	.0001
DT	-.0491	.2539	.0373	.8468
EY	-.4798	.2448	3.8419	.0500
KPMG	-.3675	.2541	2.0925	.148
PwC	-.5697	.2392	5.6699	.0173
BANKRUPT	1.1938	.1938	37.9437	.0001
HITECHB	-.2144	.2203	.9472	.3304
TOTALASSETS	.1264	.0357	12.552	.0004
US	-.1215	.2605	.2176	.6409
OUTCOME = The lower the OUTCOME score, the higher the auditor quality (six category response variable)				
0 = Auditor was never a defendant in private litigation				
100 = Auditor is or was a defendant in private litigation				
200 = Auditor paid to settle private litigation				
300 = Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding				
400 = Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit				
500 = Auditor is or was a defendant in a criminal prosecution				
DT = Deloitte & Touche; 0 = Otherwise				
EY = Ernst & Young; 0 = Otherwise				
KPMG = KPMG; 0 = Otherwise				
PwC = PricewaterhouseCoopers; 0 = Otherwise				
BANKRUPT = 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise				
HITECHB = 1 = high technology industry SIC per Bonner et al. (1998); 0 = otherwise				
TOTALASSETS = Auditee total assets in thousands of US dollars (natural log used for regression)				
US = 1 = US auditee; 0 = otherwise. Auditee nationality is defined by the corporation's principal executive office.				
Chi-Square Statistic for the Proportional Odds Assumption (32 degrees of freedom): 132 (prob. value .0001)				
Deviance Goodness of Fit Statistic, 5012 degrees of freedom: 1488 (prob. value .9999)				
Pearson Goodness of Fit Statistic, 5012 degrees of freedom: 4803 (prob. value .9986)				
Likelihood Ratio Statistic for Model, excluding intercepts, 8 degrees of freedom: 62 (prob. value .0001)				
Pseudo R squared: .0598; Adjusted pseudo R squared: .0761				

Table 11: Polytomous Regression Results 1999-2004, n=1,008, Six Category Cumulative Logit (Proportional Odds) Model With Jones et al. (1996) High Technology Variable

Explanatory Variable	Parameter Estimate	Standard Error	Wald Chi-Square	Two Sided Prob. Value
Intercept1	-6.2916	.7493	70.4988	.0001
Intercept2	-5.4269	.683	63.1406	.0001
Intercept3	-4.5081	.6514	47.8879	.0001
Intercept4	-3.235	.6345	25.9929	.0001
Intercept5	-2.352	.6292	13.9748	.0002
DT	-.0501	.2544	.0388	.8439
EY	-.464	.2455	3.5716	.0588
KPMG	-.3627	.2546	2.0296	.1543
PwC	-.5394	.2397	5.0642	.0244
BANKRUPT	1.1223	.1955	32.9449	.0001
HITECHJ	-.5154	.1903	7.332	.0068
TOTALASSETS	.106	.0362	8.5671	.0034
US	-.1133	.2611	.1883	.6643
OUTCOME = The lower the OUTCOME score, the higher the auditor quality (six category response variable)				
0 = Auditor was never a defendant in private litigation				
100 = Auditor is or was a defendant in private litigation				
200 = Auditor paid to settle private litigation				
300 = Auditor is or was a defendant or respondent in a government nonfraud civil lawsuit or SEC administrative proceeding				
400 = Auditor is alleged to have committed fraud and is or was a defendant in a government civil lawsuit				
500 = Auditor is or was a defendant in a criminal prosecution				
DT = Deloitte & Touche; 0 = Otherwise				
EY = Ernst & Young; 0 = Otherwise				
KPMG = KPMG; 0 = Otherwise				
PwC = PricewaterhouseCoopers; 0 = Otherwise				
BANKRUPT = 1 = auditee bankruptcy 1 year before or after lawsuit filing; 0 = otherwise				
HITECHJ = 1 = high technology industry SIC per Jones et al. (1996); 0 = otherwise				
TOTALASSETS = Auditee total assets in thousands of US dollars (natural log used for regression)				
US = 1 = US auditee; 0 = otherwise. Auditee nationality is defined by the corporation's principal executive office.				
Chi-Square Statistic for the Proportional Odds Assumption (32 degrees of freedom): 160 (prob. value .0001)				
Deviance Goodness of Fit Statistic, 5012 degrees of freedom: 1486 (prob. value .9999)				
Pearson Goodness of Fit Statistic, 5012 degrees of freedom: 4582 (prob. value .9999)				
Likelihood Ratio Statistic for Model, excluding intercepts, 8 degrees of freedom: 69 (prob. value .0001)				
Pseudo R squared: .0661; Adjusted pseudo R squared: .0841				