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The Development of Audit Quality Indicators

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ABSTRACT

Over the years, there has been much debate regarding audit quality. The industry has struggled with how to define audit quality, as well as, how to identify the proper framework and indicators for assessing audit quality. Audit quality gained even more attention after corporate scandals, such as Enron (2001), WorldCom (2002), Tyco (2002), HealthSouth (2003), American Insurance Group (2005), Bernie Madoff (2008) and Lehman Brothers (2011). These scandals shattered the publics' opinion of the accounting and auditing profession and caused investors to question the quality of the audits performed. To date, there is still "little agreement on how to define audit quality, let alone how to measure it" (Dickins et al. 2014, 1). This paper reviews the most recent academic articles published in the top journal during 1981 through 2017.

Key words: audit quality indicators; audit quality; assurance; AQI

INTRODUCTION

Over the years, there has been much debate regarding audit quality. The industry has struggled with how to define audit quality, as well as, how to identify the proper framework and indicators for assessing audit quality. Audit quality gained even more attention after corporate scandals, such as Enron (2001), WorldCom (2002), Tyco (2002), HealthSouth (2003), American Insurance Group (2005), Bernie Madoff (2008) and Lehman Brothers (2011). These scandals shattered the publics' opinion of the accounting and auditing profession and caused investors to question the quality of the audits performed. To date, there is still "little agreement on how to define audit quality, let alone how to measure it" (Dickins et al. 2014, 1).

In an effort to restore the public's confidence in the accounting profession and enhance audit quality, U.S. Congress passed the Sarbanes-Oxley Act of 2002. Under the Sarbanes-Oxley Act of 2002, the responsibilities of the Public Company Accounting Oversight Board (PCAOB) "are all ultimately directed at improving audit quality and thereby benefiting investors" (PCAOB 2015a, 2). With these responsibilities, in November 2012 the PCAOB identified a project that focused on identifying audit quality measures, "with a longer-term goal of tracking such measures with respect to domestic global network firms and reporting collective measures over time." (PCAOB 2012, 5). The project was known as the audit quality indicators (AQI) project.

Initially, the Board has identified over 70 possible AQIs, primarily based on previous studies regarding audit quality. Past research has mainly focused on input-based factors such as audit fees, audit partner tenure, and audit firm size. To further understand the correlation between audit quality and input-based factors, this paper will examine past research studies related to each of the aforementioned factors. By gaining a stronger understanding of these past studies, one will be able to understand the PCAOB's logic for identifying the possible AQIs.

The remainder of this paper is organized as follows. The next section identifies various definitions of audit quality. The third section provides information from the PCAOB regarding the AQI project. The following section examines factors that affect audit quality by reviewing past research. The fifth section briefly addresses the 28 potential audit quality indicators identified by the PCAOB. The final section includes a brief summary and concluding remarks.

AUDIT QUALITY DEFINED

Audit quality is an intricate and abstract concept. There has been a great deal of controversy over this topic which is why no universal definition has been recognized. Some of the most commonly recognized definitions of audit quality are those by DeAngelo (1981), the Government Accountability Office (GAO), and the PCAOB.

DeAngelo states, "The quality of audit services is defined to be the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach" (DeAngelo 1981, 186). According to the GAO, "audit quality refers to the auditor conducting the audit in accordance with Generally Accepted Auditing Standards (GAAS) to provide reasonable assurance that the audited financial statements and related disclosures are (1) presented in accordance with Generally Accepted Accounting Principles (GAAP) and (2) are not materially misstated whether due to errors or fraud" (GAO 2004, 6). The PCAOB defines audit quality "as meeting investors' needs for independent and reliable audits and robust audit committee communications on: (1) financial statements, including related disclosures; (2) assurance about internal control; and (3) going concern warnings" (PCAOB 2013, 3-4). While these definitions provide some insight into audit quality, the PCAOB believes the AQI project will refine the definition of audit quality and provide a framework that allows audit quality to be more easily measured.

BACKGROUND ON AQI PROJECT

In an effort to produce higher quality audits, the PCAOB has identified the audit quality indicators project as a priority project beginning in 2013. "The PCAOB's stated purpose of the AQI project is to identify a manageable set of impactful, objective, and measurable indicators that may provide insights into how high quality audits are achieved so that audit firms and audits can be evaluated and compared" (PCAOB 2015b, 1). As previously mentioned, this project will play an integral role in improving overall audit quality within the profession.

According to the PCAOB, audit quality indicators (AQI) are "measures that provide insight into financial statement audit quality" (PCAOB 2013, 1). The U.S. Department of the Treasury's Advisory Committee on the Auditing Profession (2008) has identified two types of AQIs: (1) output-based indicators and (2) input-based indicators. The Advisory Committee provides further explanation regarding the two types of AQIs, stating, "output-based – indicators determined by what the auditing firm has produced in terms of its audit work, and input-based – indicators of what the auditing firm puts into its audit work to achieve a certain result" (Dept. of the Treasury 2008, 116). Such output- and input-based indicators can be further broken down into engagement-level and firm-level indicators (Bedard et al. 2010, C15). Bedard has provided a list that separates audit quality indicators into these four categories (refer to **Table 1**).

For each of the input-based factors identified in **Table 1**, there has been a significant amount of research conducted. Such input-based factors are commonly divided into "operational inputs, which largely reflect personnel-driven factors; and process inputs, which largely reflect firm attributes and are intended to roughly align with five components of the Committee of Sponsoring Organizations (COSO) Internal Control Framework" (Dickins et al. 2014, 18). This

paper will examine the following operational and process input-based factors: (1) audit fees, (2) audit partner tenure, and (3) audit firm size. Research regarding the abovementioned factors has been considered by the PCAOB in developing their list of potential audit quality indicators.

In addition to using previous studies, the PCAOB has used their prior knowledge and experience in developing three main principles that have guided the development of each of the audit quality indicators. The first principle relates to the fact that the AQIs should be quantitative measures, wherever possible, "to add consistency of approach and objectivity to what would otherwise in most situations be only subjective judgments" (PCAOB 2015a, 7). Next, the Board believes AQIs should "generate data that enables users to pose critical questions" (PCAOB 2015a, 7). And finally, the AQIs "should be used and function together as a balanced portfolio of audit quality" (PCAOB 2015a, 7). The Board believes that the AQIs identified should be considered collectively and within a context to obtain their true meaning.

The Board has also identified three primary goals with respect to the AQI project. The project's goals, as identified by the PCAOB, are to: (1) Inform PCAOB regulatory processes and policy-making with additional insight into the status and trends of audit quality; (2) Possibly provide audit committees, investors, management, audit firms, other regulators, and the public with AQIs, providing insight into audit quality for their decisions and policy-making; and (3) Provide firms with additional incentives to compete based on audit quality" (PCAOB 2013, 1-2). From these goals, one can see that many different users are interested in obtaining information regarding audit quality.

The users interested in the AQI project (refer to **Table 2**) will range from audit committees to investors to the PCAOB. Each of the identified users will use the audit quality indicators for different reasons. For example, the PCAOB would be interested in the AQIs for obvious reasons such as understanding the factors that affect detection of auditing standards violations. On the other hand, audit committees may be interested in AQIs when evaluating whether or not to retain their current auditors.

Overall, the PCAOB believes the project will "improve the ability of persons to evaluate the quality of audits in which they are involved or on which they rely and to enhance discussions among interested parties" (PCAOB 2015a, 4). The Board also hopes that the AQI project will stimulate competition among audit firms, ultimately resulting in higher quality audits.

POTENTIAL AUDIT QUALITY INDICATORS

"Understanding the factors that lead auditors to compromise on audit quality is an important issue of concern to scholars, investors, and regulators" (Asthana and Boone 2012, 1). A considerable amount of research has shed light on several factors that affect audit quality. As previously mentioned, **Table 1** identifies examples of audit quality indicators, some of which include audit fees, audit partner tenure, and audit firm size. Although there are a vast number of audit quality indicators, this paper will only reference past research affecting the three previously mentioned factors.

Audit Fees and Audit Quality

Past research presents conflicting evidence regarding the association between audit fees and audit quality. In analyzing audit fees, most research assesses the relationship between abnormal audit fees and audit quality. Thus, a distinction between normal and abnormal audit fees must be made. "Normal audit fees are the expected fees given the client's size, risk, and complexity. The difference between the actual audit fee paid and the fee that was expected

given the client's size, risk, and complexity is the abnormal component" (Eshleman and Guo 2013, 18). In reviewing the literature (refer to **Table 3**), two main theories consistently appeared. The two theories identified are commonly referred to as (1) economic bonding and (2) effort view.

First, the idea of economic bonding believes that high abnormal audit fees are generally associated with bribes or client-specific quasi rents that "economically bond the auditor to the client," thus reducing auditor independence (Asthana and Boone 2012, 3). Research in support of the economic bonding theory includes: Asthana and Boone, Choi et al., and Hoitash et al. Asthana and Boone (2012) found that audit quality decreases as positive abnormal audit fees increase by assessing the relationship between abnormally high audit fees and the magnitude of discretionary accruals. Their research found that "greater economic bonding degrades audit quality by impairing auditor independence" (Asthana and Boone 2012, 1).

Choi et al. (2010a) also found that abnormally high audit fees are positively associated with the magnitude of discretionary accruals. The positive relationship between audit fees and discretionary accruals suggests a negative association between abnormal audit fees and audit quality. Choi et al. (2010a) also considered the fact that abnormally low audit fees may result in auditors having little reason to compromise audit quality. Ultimately, Choi et al. (2010a) concluded that the "association between abnormal audit fees and audit quality is asymmetric and nonlinear in the sense that the association is conditioned upon the sign of abnormal fees" (p 137).

Hoitash et al. (2007) provides additional support for the economic bonding theory with their research. Their research finds "a significant positive relation between size-adjusted and abnormal total fees paid to the auditor and two metrics used to assess audit quality – an accruals quality measure developed by Dechow and Dichev (2002), as modified by McNichols (2002) and Francis et al. (2005) and the absolute value of performance-adjusted discretionary accruals" (Hoitash et al. 2007, 762). Such findings imply a negative relationship between audit fees and audit quality. After reviewing the literature, it can be said that research in favor of economic bonding suggests that abnormally high audit fees result in lower quality audits.

The second theory, referred to as the effort view, believes that higher audit fees will result in the auditors putting forth greater effort and thus performing a higher quality audit. The research conducted by Eshleman and Guo (2013) support this view by finding "a negative relationship between the level of abnormal audit fees paid by the client and the likelihood of using discretionary accruals to meet or beat the consensus analyst forecast" (117). A negative relationship between abnormal audit fees and discretionary accruals suggests a positive relationship between abnormal audit fees and audit quality. Ultimately, the study found that "abnormal audit fees are an indication of greater auditor effort" (Eshleman and Guo 2013, 135).

Harjoto et al. (2015), relates audit fees and audit quality to the gender and ethnic diversity of CEOs. Their research sees audit fees as a proxy for audit efficiency and audit quality, similar to the effort view theory. The conclusion is that "the presence of female and minority CEOs is associated with greater assurance, leading to higher audit fees" (Harjoto et al. 2015, 969). It was found that female and minority CEOs typically demand greater assurance in order to protect their reputations, reducing the likelihood of accounting errors. However, greater assurance also creates higher audit fees. These higher audit fees are then associated with higher audit quality, concluding that "gender and ethnic diversity could improve audit quality and the firms' overall financial reporting quality" (Harjoto et al. 2015, 963).

In addition to the two theories previously mentioned, Ettredge et al. (2014) examines "the existence of downward audit fee pressure, and the consequences of fee pressure on audit quality, during the economic downturn that is often referred to as the 'Great Recession'" (247). Using financial reporting misstatements as the proxy, their research found that "downward fee pressure on audit fees is positively associated with decreased audit quality in 2008" (Ettredge et al. 2014, 250). Ettredge et al. considers this association to be restricted to times of economic hardships. However, Asthana and Boone (2012) suggest that auditors may experience pressures during times other than a recession. For example, when negotiations occur between the client and auditor, research has shown that the party with greater bargaining power will win such negotiations. Assuming the client is a large revenue-generating client for the auditor, the auditor may succumb to client's viewpoints. The auditors may feel pressure in this type of situation and may fear that the client will hire different auditors. In this scenario, the client has greater bargaining power and thus expects the auditor to concede. Such research supports the theory on client bargaining power which suggests that audit quality will decrease as negative abnormal audit fees increase. Furthermore, this research shows that downward fee pressure may result in lower quality audits, regardless of the economy.

Hribar et al. (2014) focuses on the relationship between audit fees and accounting quality rather than audit quality. Their research finds that "lower quality accounting systems result in higher fees charged by auditors" (Hribar et al. 2014, 514). When a lower quality accounting system is in place, auditors will be required to compensate with additional effort on their part. In order to balance the added risk and extra audit hours associated with a lower quality accounting system, auditors will increase fees. In addition, Hribar et al. (2014) found that "unexplained audit fees are incrementally informative for predicting restatements, fraud, and SEC comment letters" (536). These factors are generally associated with lower audit quality.

In addition to audit fees, Lim et al. (2012) examines the relationship between audit quality and non-audit fees. Their research finds that "as non-audit fees increase, audit quality reduces only for clients with low institutional ownership but not for clients with high institutional ownership" (Lim et al. 2012, 343). The explanation for this correlation is that clients with high institutional ownership are more likely to monitor the auditors closely, encouraging higher audit quality. The closely monitored auditors will feel more pressure to remain independent and perform well in order to protect their reputation and avoid possible litigation expenses. Therefore, the relationship of audit quality being reduced by non-audit fees exists only for clients with low institutional ownership.

The relationship between audit fees and audit quality has proven to be of particular interest to many researchers. This interest has stemmed from the fact that studies have proven that high abnormal audit fees result in both higher and lower quality audits. In reviewing the literature, it is clear that more than one association exists between audit fees and audit quality and further research is required to resolve these issues.

Audit Partner Tenure and Audit Quality

Research examining the relationship between audit partner tenure and audit quality also presents conflicting arguments. In studying the literature (refer to **Table 4**), there are two common views that persist: (1) auditor independence and (2) auditor expertise. The first theory, auditor independence, assumes that as audit partner tenure increases, the partner will build personal relationships with the client, ultimately reducing auditor independence. This theory suggests that the quality of an audit will be lower due to the familiarity threat and lack of auditor independence. The second theory, auditor expertise, believes that the audit partner

will obtain greater client-specific knowledge, useful in conducting a quality audit, the longer the partner is assigned to the same engagement.

Fargher et al. (2008) and Carey and Simnett (2005) provide support for the auditor independence viewpoint. Fargher et al. (2008) finds "that as audit partner tenure increases, client managers' accounting discretion also increases" (180). This positive relationship is indicative of a negative association between audit partner tenure and audit quality, supporting the auditor independence theory. Carey and Simnett (2005) examine the relationship between audit partner tenure and audit quality through the use of three proxies: (1) "auditors' propensity to issue going-concern audit opinions for distressed companies;" (2) "an examination of the signed and absolute amounts of abnormal working capital accruals;" and (3) "the extent to which key earnings benchmarks are just beaten and just missed" (673). Keeping in mind that the data used for this research was prior to the implementation of mandatory partner rotation, such research concludes that long audit partner tenure impairs audit quality. More specifically, "For the measures of audit quality examining the auditor's propensity to issue a going-concern audit opinion and just meeting (missing) earnings benchmarks, we find evidence consistent with a diminution in audit quality association with long audit partner tenure" (Carey and Simnett 2005, 674).

However, after the implementation of mandatory audit partner rotation, Carey and Simnett's research is revisited by Monroe and Hossain. In contrast to Carey and Simnett's original results, Monroe and Hossain (2013) find a "significant positive association between audit partner tenure when tenure is five years or more and the likelihood of an auditor issuing a going-concern opinion for a financially distressed company" (263). Their research finds that "auditors are more likely to issue qualified going-concern opinions for financially distressed companies when there is a mandatory audit partner rotation after a fixed period of time" (Monroe and Hossain 2013, 263). Thus, their research proves that mandatory audit partner rotation has improved the quality of audits performed and supports the theory of auditor expertise. In addition to Monroe and Hossain's research, Ghosh and Moon and Manry et al. provide empirical evidence in support of the auditor expertise theory.

Ghosh and Moon (2005) "examine whether the extent to which analysts rely on past reported earnings to predict future earnings varies with tenure" (586). Consistent with the auditor expertise theory, their findings conclude "that audited financial statements, and in particular reporting earnings, are perceived as more reliable for firms with longer auditor tenure" (Ghosh and Moon 2005, 609). Manry et al. (2008) find a significant negative correlation between discretionary accruals and audit partner tenure. This relationship suggests a positive association between audit partner tenure and audit quality. Thus, their research supports the auditor expertise viewpoint. Furthermore, their research controls for certain factors, such as client size and engagement risk, and finds that "audit quality increases with partner tenure for small clients, but is unrelated to partner tenure with large clients" (Manry et al. 2008, 554). The research by Manry et al. (2008) also suggests mandatory audit partner rotation may actually reduce audit quality.

Although much research has been conducted over the years relating to the relationship between audit partner tenure and audit quality, such research has only lead to conflicting results. Ultimately, the relationship between audit partner tenure and audit quality is inconclusive.

Audit Firm Size and Audit Quality

"One of the earliest theories in the audit literature is that Big 4 auditors, due to their larger size

and better training programs, provide higher audit quality than other auditors" (Eshleman and Guo 2014, 197). The following research (refer to **Table 5**) supports this theory: Eshleman and Guo (2014), Davidson and Neu (1993), Christensen et al. (2014), Francis and Yu (2009), Choi et al. (2010b), Colbert and Murray (1998), and Meckfessel and Sellers (2017).

Eshleman & Guo (2014) use "the incidence of accounting restatements as a measure of audit quality" to find that "clients of Big 4 audit firms are less likely to subsequently issue an accounting restatement than are clients of other auditors" (197). Davidson & Neu (1993) "propose that comparison of management earnings forecasts with audited, reported earnings provides an approach to the measurement of audit quality" (479). Their research suggests that larger auditing firms are generally associated with larger forecast errors, which is consistent with the theory that larger audit firms perform higher quality audits. Christensen et al. (2014), compares the opinions of audit professionals and investors regarding the relationship between audit firm size and audit quality. Their research found that "both groups associate audit firm size with higher audit quality and that investors view frequent audit firm change as an impediment to audit quality" (Christensen et al. 2014, 36).

While most research examines the relationship between audit firm size and audit quality, Francis and Yu (2009) and Choi et al. (2010b) have provided insight on the relationship between the office size of an audit firm and audit quality. Francis & Yu (2009) "examine the association of office size with going-concern audit reports and client earnings properties" (1522). Their findings suggest that larger Big 4 offices are more likely to issue a going-concern report than other audit offices. Francis and Yu (2009) document "a systematic association between Big 4 office size and audit outcomes consistent with larger offices producing higher quality audits" (1549). Similar to the results of the research performed by Francis and Yu (2009), Choi et al. (2010b) found that "large local offices provide higher-quality audits compared with small local offices" (73). In conducting their research, Choi et al. used unsigned abnormal accruals as the proxy for determining the relationship between office size and audit quality.

Colbert and Murray conducted an analysis on small CPA firms and found results similar to prior research. Colbert and Murray (1998) examined the relationship between audit firm size and audit quality by "measuring auditor quality based on outcomes from the AICPA's Private Companies Practice Section (PCPS) Peer Review Program" (136). Their research found that "even among small CPA firms, size is an indicator of quality for firms that perform audits, reviews, and compilations" (Colbert and Murray 1998, 148).

Instead of focusing on the relationship between audit firm size and audit quality, Meckfessel and Sellers (2017) explore the relationship between consulting practice size and audit quality. Their research found that "consulting practice size has a positive and statistically significant influence on audit reporting lag and restatement rate" (Meckfessel and Sellers 2017, 19), indicating lower audit quality. It was found that when an audit firm has a larger consulting practice size there is a decreased focus on auditing services, resulting in a decrease in audit quality.

The association between audit firm size and audit quality appears to provide more conclusive evidence than audit fees and audit partner tenure that a relationship exists between audit quality and a specific indicator. Based on a review of current literature, one can conclude that there is a positive relationship between audit firm size and audit quality.

CURRENT STATUS ON AQI PROJECT

Since the inception of the AQI project, the PCAOB has identified a number of potential audit quality indicators. More recently, the Board has narrowed down the number of audit quality indicators to consist of a list of 28 that they believe will effectively measure audit quality. The framework developed for analyzing audit quality is broken down into three parts: (1) Audit Professionals, (2) Audit Process, and (3) Audit Results. Each of the three sections are further broken down into various subsections. **Table 6** outlines the framework and identifies the indicators proposed by the PCAOB. Some of the indicators identified include: staffing level, industry expertise of audit personnel, quality ratings and compensation, and timely reporting of internal control weaknesses.

Of the three audit quality factors addressed in this literature review, only audit fees were directly included in the PCAOB's list of potential indicators. The other two audit quality factors, audit partner tenure and audit firm size, are not explicitly identified in the list of 28 indicators. However, the PCAOB has acknowledged independence requirements, going-concern issues, and industry expertise as potential indicators; all of which were factors discussed in relation to audit partner tenure and audit firm size within this literature review. The studies included in this literature review have not only made significant contributions to enrich research on audit quality, they have also made peer-reviewed contributions to addressing issues raised by the PCAOB's AQI project.

CONCLUSION

In summary, the research suggests conflicting views with respect to factors affecting audit quality. Although much of the research is inconclusive, the PCAOB believes that the implementation of the AQI project will solve some of the mysteries related to audit quality. The Board hopes that the project will "provide new insights about how to evaluate the quality of audits and how high quality audits are achieved" (PCAOB 2015a, ***). By furthering the development of the AQI project, hopefully one day a universal definition of audit quality will be recognized as well as a proper framework and indicators for assessing the quality of an audit.

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TABLE 1
Examples of Audit Quality Indicators

Measurable INPUTS to Audit Quality	Example of Sources Using Indicator	Measurable OUTPUTS of Audit Quality	Example of Source Using Indicator
Engagement-Level Indicators			
Audit hours	O'Keefe et al. (1994)	Accuracy of audit opinion	Francis and Yu (2009)
Training hours	Chen et al. (2008a); Deloitte (2010)	Accounting and Auditing Enforcement Releases detailing individual acts indicating low audit quality, including 10A Proceedings	SEC; Feroz et al. (1991)
Personnel assignment	Johnstone and Bedard (2001); Low (2004)		
Audit fees	Carcello et al. (2002)		
Audit partner tenure	Carey and Simnett (2006); Chi et al. (2009); Bedard and Johnstone (2010)	Client discretionary accruals and other earnings quality measures	Hoitash et al. (2007); Chen et al. (2008b)
Tailoring of audit tests to reflect client risk	Elder and Allen (2003)		
Audit budgeting	Gist and Davidson (1999); Bedard et al. (2008)		
Individual auditor industry specialization	Owhoso et al. (2009); Thibedeau (2003)		
Firm-Level Indicators			
Audit firm size	Francis (1984)	Litigation* and related costs	Palmrose (1988); Khurana and Raman (2004); Deloitte (2010)
Audit firm industry specialization	Craswell et al. (1995)		
Audit firm tenure	Carcello and Nagy (2004)	Inspection activities and report results	PCAOB; Hermanson et al. (2007); Deloitte (2010)
Audit firm independence	Simunic (1984); Francis (2006)	Peer review results	AICPA; Casterella et al. (2009)
Audit firm compensation plans	Trompeter (1994); Carcello et al. (2000)	Internal inspection results	

* While we classify litigation as a firm-level indicator, we acknowledge that litigation related to specific engagement may be linked to the quality of the conduct of individual audit engagements.

****Table directly from, "Audit Quality Indicators: A Status Update on Possible Public Disclosures and Insights from Audit Practice" by Bedard et al. (2010).**

TABLE 2
Users of AQIs

Potential AQI User	Potential Use (Decisions AQIs Can Influence)
Audit Committees	• Assess reporting risk and audit quality • Retain and compensate auditors • Oversee auditors
Audit Firms	• Assess and manage risk • Improve quality control efforts and, ultimately, audit quality • Identify root causes of audit deficiencies and remediate weaknesses.
Investors	• Assess reporting risk • Vote shares
PCAOB (and other Regulators)	• Inform policy-making • Assist root cause and quality control projects • Stimulate public discussion of, and market demand for, quality

****Table directly from PCAOB Release No. 2015-005.**

TABLE 3
Audit Fees and Audit Quality

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Michael Ettredge, Elizabeth Emeigh Fuerherm, & Chan Li	To investigate the existence of downward audit fee pressure, and the consequences of that fee pressure on audit quality, during the economic downturn.	Downward pressure on audit fees is positively associated with decreased audit quality in 2008.	Mathematical models and equations	A sample of all public companies covered by both Audit Analytics and Compustat in 2008 were obtained. A final sample of 3,039 firms in 2008 was used to estimate the fee models needed to calculate expected audit fees in 2008 and the model used to test the hypothesis.	The findings suggest that auditors made fee concessions to some clients in 2008, and that fee pressure was associated with reduced audit quality in that year.
Sharad C. Asthana & Jeff P. Boone	To assess the effects that abnormal audit fees have on audit quality by examining economic bonding and client bargaining power; To analyze pre-SOX and post-SOX data to determine whether the SOX reforms increased audit quality.	H1a: Audit quality will decline as below-normal audit fee increases in magnitude. H1b: The association predicted in H1a will be amplified as proxies for client bargaining power increase. H2: Audit quality will decline as above-normal audit fees increase in magnitude. H3: The association between audit quality and abnormal audit fees will be attenuated in the post-SOX period as compared to the pre-SOX period.	Mathematical models and equations	The sample selection includes observations for the period 2000–2009 available in the Audit Analytics database for non-Anderson clients. The total sample size used was 18,873 observations.	This study finds that audit quality, proxied by absolute discretionary accruals and meeting or beating analysts' earnings forecasts, declines as negative abnormal audit fees increase in magnitude, with the effect amplified as proxies for client bargaining power increase. The study also concludes that in years following the Sarbanes-Oxley Act (SOX), this effect is reduced, suggesting that SOX was effective in enhancing auditor independence, thus audit quality.
Rani Hoitash, Ariel Markelevich, & Charles A. Barrangato	To capture the relation between audit quality and auditor independence by examining fees paid by firms in the context of auditor profitability.	Principal objective is to ascertain whether larger size-adjusted or abnormal fees result in a higher or lower quality audits.	Mathematical models and equations	Data was obtained from Standard & Poor's Audit Fee Database. The final data set consisted of 13,860 observations.	The key results of this study find a significant positive relation between size-adjusted and abnormal total fees paid to the auditor and two metrics used to assess audit quality – an accruals quality measure developed by Dechow and Dichev (2002), as modified by McNichols (2002) and Francis et al. (2005) and the absolute value of performance-adjusted discretionary accruals during the period 2000-2003.

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
John Daniel Eshleman & Peng Guo	To shed light on the conflicting evidence by performing a study of the relationship between abnormal audit fees and audit quality using a new research design. More specifically, to examine whether clients paying abnormal audit fees are more or less likely to use discretionary accruals to meet or beat the consensus analyst forecast.	There was no explicitly stated hypothesis within the study.	Mathematical models and equations	This study obtained audit fee and auditor data from Audit Analytics, financial statement data from Compustat and analyst forecast data from the I/B/E/S. The study required firms to have earnings before discretionary accruals less than the consensus analyst forecast. The sample amount was 1,670 firm-year observations spanning from 2000-2011.	The key findings suggest that clients paying higher abnormal audit fees are less likely to use income-increasing discretionary accruals to meet or beat earnings targets. This is consistent with the notion that abnormal audit fees are an indication of greater auditor effort.
Jong-Hag Choi, Jeong-Bon Kim & Yoonseok Zang	To examine whether and how audit quality proxied by the magnitude of absolute discretionary accruals is associated with abnormal audit fees, that is, the difference between actual audit fee and the expected, normal level of audit fee.	H1: Abnormal audit fees are not significantly associated with audit quality when the association between the two is not conditioned upon the sign of abnormal audit fees. H2: For clients with positive abnormal audit fees, abnormal audit fees are positively associated with the magnitude of discretionary accruals.	Mathematical models and equations	Data was obtained from the Compustat audit fees file. The full sample size consists of 9.815 firm-years over the four-year sample period.	This study finds that the association between abnormal audit fees and audit quality is asymmetric and nonlinear in the sense that the association is conditioned upon the sign of abnormal audit fees.
Paul Hribar, Todd Kravet, & Ryan Wilson	To assess the relationship between audit fees and accounting quality and connect accounting quality to instances of fraud, restatements, and SEC comment letters.	Audit fees contain information about firms' accounting quality.	Mathematical models and equations	Data was obtained from various sources. Audit Analytics was used to obtain audit fee data. The Compustat database was used as well.	This research finds that unexplained audit fees contain information about firms' accounting quality. It was also found that unexplained audit fees are incrementally informative for predicting restatements, fraud, and SEC comment letters.

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Chee Yeow Lim, David K. Ding, & Charlie Charoenwong	To examine the relationship between audit quality and non-audit fees as a condition of institutional monitoring.	Audit clients with low institutional ownership will have lower audit quality when non-audit fees increase than clients with high institutional ownership.	Mathematical models and equations	The sample included 13,789 firm-years, and the fee information was obtained through the Audit Analytics database for fiscal years 2000-2001.	The key findings suggest that external monitoring affects the association between non-audit fees and audit quality. The research indicates that as non-audit fees increase, audit quality is reduced only for firms with low institutional ownership.
Maretno Agus Harjoto, Indrarini Laksmana, & Robert Lee	To examine the impact of gender and ethnicity of CEO and audit committee members (directors) on audit fees and audit delay in the US firms.	H1a: CEO gender is associated with audit fees. H1b: CEO ethnicity is associated with audit fees. H2a: The proportion of female audit committee members is associated with audit fees. H2b: The proportion of ethnic minority audit committee members is associated with audit fees. H3a: The presence of a female CEO is negatively associated with audit delay. H3b: The presence of an ethnic minority CEO is negatively associated with audit delay. H4a: The proportion of female audit committee members is associated with audit delay. H4b: The proportion of ethnic minority audit committee members is associated with audit delay.	Mathematical models and equations	Data was obtained from a variety of sources: audit data from the Audit Analytics database, financial data from Compustat, stock market data from Center for Research in Security Prices (CRSP), CEO tenure and CEO turnover data from Execucomp and director data from RiskMetrics Investor Responsibility Resource Center (IRRC).	This research found that female CEOs, ethnic minority CEOs, and ethnic minority directors, compared to male Caucasian CEOs and directors, are associated with higher audit fees. This implies that gender and ethnic diversity in corporate leadership and boardrooms could improve audit quality and the overall financial reporting quality.

TABLE 4
Audit Partner Tenure and Audit Quality

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Gary Monroe & Sarowar Hossain	To investigate whether audit partner tenure and audit qualiy associations remain significant after the implementation of mandatory audit partner rotation.	There is a significant association between audit partner tenure and audit quality as measured by the propensity of auditors to issue going-concern opinions for financially distressed companies.	Mathematical models and equations	Audit opinion and audit partner data are hand-collected from annual reports in the AspectHuntley DatAnalysis and Connect4 databases. Financial data are downloaded from the AspectHuntley FinAnalysis database. The final sample consists of 4,711 firm-year observations	The study finds a significant positive association between long audit partner tenure and the likelihood of issuing a going-concern opinion for a financially distressed company. The results provide evidence of higher audit quality for longer audit partner tenure after the introduction of mandatory audit partner rotation.
Peter Carey & Roger Simnett	To examine the association between audit quality and long audit partner tenure by looking at the following three measures: (1) auditor's propensity to issue a going-concern audit opinion for distressed companies, (2) the direction and amount of abnormal working capital accruals and (3) beating (missing) earnings benchmarks.	There is a negative association between audit quality and long audit partner tenure.	Mathematical models and equations	The data collection for this study involved the review and analysis of published information for public companies listed on the Australian Stock Exchange (ASX) in 1995. A final sample of 1,021 Australian-domicile companies was used.	For the measures of audit quality examining the auditor's propensity to issue a going-concern audit opinion and just meeting (missing) earnings benchmarks, we find evidence consistent with a diminution in audit quality associated with long audit partner tenure.
David L. Manry, Theodore J. Mock & Jerry L. Turner	To examine whether there is a relationship between evidence of reduced audit quality, measured by estimated discretionary accruals, and audit partner tenure with a specific client.	Audit quality is reduced as audit partner tenure with a client increases.	Mathematical models and equations	The firms examined in this study are a subset of the sample compiled by Mock and Turner (2005), who investigate the relationship between auditor risk assessments and audit program planning judgments. A sample was obtained of two years of data from audits of 202 clients conducted by three audit firms. The final sample for this study was 90.	The key findings suggest that audit quality increases with partner tenure for small clients, but is unrelated to partner tenure for large clients. It also suggests that audit partner rotation may not increase audit quality as desired by Congress, but instead may actually reduce audit quality for some companies.

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Neil Fargher, Ho-Young Lee & Vivek Mande	To examine the effect of audit partner tenure on client managers' accounting discretion.	H1: All else constant, there is no change in client managers' accounting discretion as audit partner tenure on an engagement increases. H2: All else constant, there is no difference in client managers' accounting discretion across short- and medium-tenured audit partners. H3: All else constant, there is no difference in client managers' accounting discretion across medium- and long-tenured audit partners.	Mathematical models and equations	The initial sample consisted of the population of publicly traded Australian firms that were publicly traded on the ASX for which annual reports were available over the period 1990-2004. The annual reports were obtained from DatAnalysis. Due to the number of restrictions, the sample used in this study amounted to 1,306 firms or 12,077 firm-year observations.	This study finds that, in the initial years of tenure of a new audit partner, client managers' accounting discretion decreases when the new partner is from the same audit firm as the outgoing partner. However, when the new audit partner is form a different audit firm as the outgoing partner (audit firm rotation), it is found that client managers' accounting discretion increases in those initial years.
Aloke Ghosh, Baruch College & Soocheol Moon	To examine whether the extent to which analysts rely on past reported earnings to predict future earnings varies with tenure.	Reported earnings are perceived as being more reliable as auditor tenure increases.	Mathematical models and equations	The full sample includes Compustat firms with available data from 1990 to 2000. The restricted sample consists of firms in the full sample with auditor-client relationships lasting for at least five years. The maximum number of observations for the "restricted" sample was 35,826 firm-years.	In general, most of the results are consistent with the hypothesis that audited financial statements, and in particular reported earnings, are perceived as more reliable for firms with longer auditor tenure. The study suggests that imposing mandatory limits on the duration of the auditor-client relationship might impose unintended costs on capital market participants.

TABLE 5
Audit Firm Size and Audit Quality

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Gary Colbert & Dennis Murray	To examine the relationship between audit quality and auditor size for small CPA firms by using peer review ratings from the AICPA's Private Companies Practice Section	H1: Firm size is positively associated with auditor quality. H2: The number of previous reviews is positively related to audit quality. H3: Peer review ratings differ for the two oversight organizations.	Mathematical models and equations	The study used a nationwide sample of 422 small CPA firms selected from the American Institute of Certified Public Accountants' (AICPA) Private Companies Practice Section Peer Review Program	The findings indicate that audit quality is positively related to auditor size. Even among small CPA firms, size is an indicator of quality for firms that perform audits, reviews, and compilations.
Jong-Hag Choi, Chansog (Francis) Kim, Jeong-Bon Kim, and Yoonseok Zang	To investigate whether and how the size of a local practice office within an audit firm is a significant, engagement-specific factor determining audit quality and audit fees over and beyond audit firm size at the national level and auditor industry leadership at the city or office level.	H1: Audit quality, measured by unassigned abnormal accruals, is not associated with the size of a local engagement office, other things being equal. H2: Audit fees paid to auditors are not associated with the size of a local engagement office, other things being equal.	Mathematical models and equations	The initial sample consisted of firms included in the Audit Analytics database for the six-year period from 2000-2005 for which data on audit fees and the location of city-level audit engagement offices are available. After excluding certain firms from the sample, the final sample consisted of 55,704 firm-year observations.	First, this study finds that the office size if positively associated with audit quality proxied by unsigned abnormal accruals. Second, this study finds that large local offices are able to charge higher audit fees to their clients than small ones, which is consistent with the view that large offices provide higher quality audits than small offices. Overall, the results suggest that both regulators and audit firms should pay more attention to the behavior of small offices because they are more likely to be economically dependent on a particular client, and thus to compromise audit quality.
Ronald Davidson & Dean Neu	To provide preliminary evidence on the association between audit firm size and audit quality by using management earnings forecasts as a benchmark against which audit actual results were compared.	There was no explicitly stated hypothesis within the study.	Mathematical models and equations	The sample used for this study included descriptive statistics from 112 firms that applied for an initial Toronto Stock Exchange (TSE) listing between 1983 and 1987.	Consistent with other research, this study suggests that larger auditing firms are associated with higher-quality audits.

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
John Daniel Eshleman & Peng Guo	To reexamine whether Big 4 auditors deliver higher quality after controlling for the endogenous choice of auditor. The audit quality proxy chosen is the likelihood of a firm issuing an accounting restatement.	H1: Clients of Big 4 auditors have a lower likelihood of issuing an accounting restatement than clients of non-Big 4 auditors after controlling for the client's propensity to choose a Big 4 auditor. H2: Clients of the Big 4 have a lower likelihood of using an accounting restatement than clients of Mid-tier auditors after controlling for the client's propensity to choose a Big 4 auditor.	Mathematical models and equations	This study obtained financial statement data from the Compustat Fundamentals Annual file and auditor and restatement data from Audit Analytics for the period 200-2009. The sample selection differs for each hypothesis. To test the first hypothesis, a sample of 5,950 observations were used. To test the second hypothesis, a sample of 3,248 observations were used.	This study finds that clients of Big 4 auditors are less likely to subsequently restate their earnings than are clients of non-Big 4 auditors. We also find weak evidence that clients of the Big 4 are less likely to issue a restatement than are clients of Mid-tier auditors. Taken together, the evidence is consistent with Big 4 auditors delivering higher quality audits.
Jere R. Francis & Michael D. Yu	To analyze the effects of client influence and auditor industry expertise in individual practice offices of Big 4 accounting firms and to investigate a fundamental question: Is Big 4 audit quality uniform across small and large practice offices?	Larger offices of Big 4 accounting firms provide higher quality audits, where higher quality audits are inferred by the auditor's likelihood of issuing a going-concern audit report (and accuracy of the report in predicting client bankruptcy), and the degree to which clients evidence earnings management behavior.	Mathematical models and equations	This study examined a sample of 6,568 U.S. firm-year observations for the period 2003-2005 and audited by 285 unique Big 4 offices.	This study suggests a systematic association between Big 4 office size and audit outcomes consistent with larger offices producing higher quality audits.
Brant E. Christensen, Steven M. Glover, Thomas C. Omer, & Marjorie K. Shelley	To examine the thoughts of audit professionals and investors regarding audit quality, specifically how they define and evaluate audit quality.	There was no explicitly stated hypothesis within the study.	Survey; Mathematical models and equations	This study obtained usable responses from 96 auditor participants, coordinating with the CAQ's Research Advisory Board	This study found key similarities and differences between the opinions of auditors and investors regarding audit quality. It was found that both groups associate audit firm size with higher audit quality. It was also found that investors, more than auditors, view frequent audit firm change as an impediment to audit quality.

Author	Purpose	Hypotheses	Method	Sample	Key Results/Findings
Michele D. Meckfessel & Drew Sellers	To explore the relationship between the regrowth of sizable consulting practices by the Big 4 and audit reporting lag and restatement rates.	H1: Percent of revenue from consulting fees paid to Big 4 auditors is positively associated with audit-reporting lag. H2: Percentage of revenue from consulting fees paid to Big 4 auditors is positively associated with restatements.	Mathematical models and equations	This study used the Audit Analytics database to obtain a sample of SEC-registered US audit clients of the Big 4.	This study found that Big 4 audit practices are not immune to the presence of large consulting practices within the same firm. It was found that consulting practice size has a positive and statistically significant influence on audit reporting lag and restatement rate, indicating lower audit quality due to a decreased focus on auditing.

TABLE 6
Potential Audit Quality Indicators

AUDIT PROFESSIONALS	Availability	1. Staffing Leverage 2. Partner Workload 3. Manager and Staff Workload 4. Technical Accounting and Auditing Resources 5. Persons with Specialized Skill and Knowledge
	Competence	6. Experience of Audit Personnel 7. Industry Expertise of Audit Personnel 8. Turnover of Audit Personnel 9. Amount of Audit Work Centralized at Service Centers 10. Training Hours per Audit Professionals
	Focus	11. Audit Hours and Risk Areas 12. Allocation of Audit Hours to Phases of the Audit
AUDIT PROCESS	Tone at the Top and Leadership	13. Results of Independent Survey of Firm Personnel
	Incentives	14. Quality Ratings and Compensation 15. Audit Fees, Effort, and Client Risk
	Independence	16. Compliance with Independence Requirements
	Infrastructure	17. Investment in Infrastructure Supporting Quality Auditing
	Monitoring and Remediation	18. Audit Firms' Internal Quality Review Results 19. PCAOB Inspection Results 20. Technical Competency Testing
AUDIT RESULTS	Financial Statements	21. Frequency and Impact of Financial Statement Restatements for Errors 22. Fraud and other Financial Reporting Misconduct 23. Inferring Audit Quality from Measures of Financial Reporting Quality
	Internal Control	24. Timely Reporting of Internal Control Weaknesses
	Going Concern	25. Timely Reporting of Going Concern Issues
	Communications between Auditors and Audit Committee	26. Results of Independent Surveys of Audit Committee Members
	Enforcement and Litigation	27. Trends in PCAOB and SEC Enforcement Proceedings 28. Trends in Private Litigation

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