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# Regulation And The Auditing Profession

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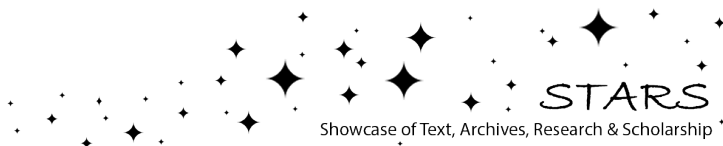
# REGULATION AND THE AUDITING PROFESSION

by

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# ABSTRACT

The dissertation consists of three studies examining three different regulatory issues that affect the auditing profession. The first study has two main foci. First, the study investigates the impact of Sarbanes-Oxley Act (SOX) on the Big 4 fee premium. Second, the study investigates the relationship between the size of an audit client and annual fee change. The results show that in the post-SOX environment, clients of non-Big 4 firms have experienced greater increases in audit fees than the clients of the Big 4 firms, resulting in a diminishing Big 4 premium. This is consistent with the notion that non-Big 4 clients had to make significant adjustments to meet post-SOX quality requirements by increasing their effort (and consequently audit fees). The results also show audit firms' large clients experience the largest percentage increase in audit fees. This is consistent with the theoretical view of consumer surplus, where the large clients, with more resources, have greater levels of consumer surplus, which is being captured by the audit firms. The study contributes to our understanding of the impact of SOX on audit fee premium and the economics of audit market competition in different client segments.

The second study is focused on three main areas: 1) the relationship between audit fees and audit market concentration on a country level; 2) the effect of a country's litigation regime on the relationship between audit fees and market concentration and 3) the inter-relations between competition, fees, and quality in the market for audit services. The study is motivated by the current debate in the United States and the European Union about the possible problems associated with the current oligopolistic structure of the audit market. The contribution of this study lies in the fact that it provides a multi-national empirical investigation of the audit competition-fee relationship, and examination of how country-level fees affect the competition-quality relationship, while controlling for country level factors. Results show a negative

relationship between country-level market concentration and audit fees but only in highly litigious countries, suggesting that the firms are able to obtain economies of scale in more concentrated markets and are willing to pass savings down to their clients. However this relationship only holds for the clients of the Big N firms. Analysis of audit quality suggests that audit quality is higher in more concentrated markets but mediation analysis did not show that the fees mediate the relationship between audit quality and market concentration.

The third study addresses current regulatory debate about the responsibility of the principal auditor in the group audit environment. Current United States standards allow the principal auditor to disavow responsibility for parts of the audit which were performed by a third party auditor by referencing them in the auditor's opinion and then indicating the part of the audit which was performed by them. This disclaimer of responsibility is prohibited under the international auditing standards, which require the principal auditor to be responsible for the entire group audit. Specifically, this study examines 1) audit quality implications related to such opinions, and 2) the relationship between having a shared opinion and audit fees. The results show that the audit quality is significantly lower for the firms whose audit opinion referenced a third party auditor. The results also provide some evidence that audit fees are lower in shared responsibility situations.

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## Introduction

The purpose of this study is two-fold.  In the first part of the paper, I investigate the differences between annual changes in audit fees charged by the Big 4 and non-Big 4 firms in the post-Sarbanes-Oxley Act (SOX) environment.  One of the main purposes of SOX was increasing audit quality, which, as prior research showed, also resulted in increased fees (Ghosh and Pawlewicz, 2009; Bhamornsiri et al.,2009; Griffin and Lont, 2007).  Studying the differences in changes in audit fees between the Big 4 and non-Big 4 firms allows me to examine whether SOX had unintended consequences in terms of affecting the competitive structure of the audit market. If in the post-SOX environment the gap between the Big 4 and non-Big 4 increases, then this would suggest that SOX allowed the Big 4 to increase their oligopolistic powers and to further increase their fees.  On the other hand if the Big 4/non-Big 4 gap diminishes, this would suggest a "leveling of the playing field", where smaller audit firms used new requirements established by SOX to bring their fees closer to the fees charged by the Big 4.

I argue that SOX changed the regulatory regime faced by auditors of the SEC registrants, and this change impacted the Big 4 and non-Big 4 differently.  I then present and test two theoretical arguments that give conflicting predictions about the effect of SOX on the Big 4 and non-Big 4 fees.  This study extends the work by Ghosh and Pawlewicz (2009) and Grifin and Lont (2007) by investigating how the gap between the Big4 and non-Big4 fees (Big 4 premium) changed in the post-SOX environment.  Ghosh and Pawlewicz (2009) find that Big 4 clients experienced higher increases in audit fees than non-Big 4 clients, but their study does not control

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for the SOX 404 effects. Griffin and Lont (2007) show that audit fees increased post-SOX, but they look only at the Big 4 clients. This manuscript extends prior research by using a sample which controls for major elements that affect audit fees: I include both Big 4 as well as non-Big 4 companies, and include only observations that comply with SOX 404(b), though not in the initial year of adoption in order to avoid confounds. I find that in the post-SOX environment, clients of non-Big 4 firms experienced higher percentage fee increases than client of the Big4 firms, suggesting that the Big 4 fee premium has diminished after SOX. This is consistent with the notion that non-Big 4 firms had to make larger adjustments to their audits than the Big 4 firms in order to comply with stricter regulatory requirements imposed by SOX.

The second part of this study is also focused on the fee changes in the post-SOX environment. However in this study I investigate whether audit firms have different pricing strategies for their large and small clients. I investigate which clients (large or small, as compared to the other clients in each firm's portfolio) experienced the largest change in audit fees after the passage of SOX. Similar to the analysis of audit firms (discussed previously), I present and test two competing theoretical arguments on how fees paid by large and small clients are affected by a change in the regulatory regime. The results show that large clients (as compared to other clients in the audit firm portfolio) have experienced the greatest percentage increases in audit fees. This supports the theoretical notion that large clients, which have more resources, have higher levels of consumer surplus which is captured by the audit firms. The study extends the work by Ghosh and Lustgarten (2006) by investigating which subgroup of clients experiences the greatest audit fee changes.

The study contributes to our knowledge of the effect of regulation on the economics of audit market competition. While the Big 4 fee premium is a commonly used concept in the

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auditing literature, very little research has examined how it has changed over time and how it is impacted by regulation, especially regulation as significant as SOX. Furthermore, little is known about which client segments drive the Big 4 fee premium and changes in the level of that premium over time in the United States.

The paper is organized as follows. The next section includes the discussion of the impact of the Sarbanes-Oxley Act on the auditing profession and specifically the differential impact on the Big 4 and non-Big 4 firms. The following section provides theoretical views on the relationship between audit fees and client segments. The subsequent section describes the methods. The last two sections include the results and the conclusion.

## Impact of the Sarbanes-Oxley Act

The Sarbanes Oxley Act of 2002, passed as a response to accounting scandals like Enron and WorldCom, included a number of changes that directly affected the accounting profession. The Act:

- included section 404(b) which requires certain registrants to obtain an assessment of internal controls from an independent accounting firm[1].
- created the Public Company Accounting Oversight Board, which is responsible for overseeing firms that conduct financial statement audits for SEC registrants.
- increased enforcement power for the Securities and Exchange Commission.

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[1] Large accelerated and accelerated filers have been required to comply with 404(b) since November 15, 2004. The compliance date for non-accelerated filers was pushed back for several years until the Dodd-Frank Act of 2010 exempted such companies from 404(b) compliance.

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These, and other aspects of SOX, have directly affected the economics of the market for audit services, in part by driving up the costs of those services. Simunic (1980) proposes that audit firms have two main cost drivers: effort and litigation. SOX has significantly affected the fees charged by the audit firms by affecting these cost drivers.

SOX contains several provisions that require an increase in audit firm effort (e.g. new requirements were introduced related to off-balance sheet transactions and increased auditor communication with the audit committee). However the provision of SOX that had the most significant effect on audit effort was Section 404 (b). This section required SEC registrants to engage an independent accounting firm to provide an annual evaluation of the registrant's internal control effectiveness. This evaluation of internal controls required significant effort on the part of audit firms, especially in the first year of adoption. Research has shown that this additional effort led to increased audit fees. For example, Raghunandan and Rama (2006) find that in the initial year of 404(b) compliance, audit fees increase 86%. Bhamornsiri et al. (2009) go beyond the first year of Section 404 adoption; their results show a large increase in audit fees related to initial Section 404 adoption (65% as compared to the prior year), but almost no increase (0.9%) in the second year (relative to the first year) of Section 404 compliance.

The second major audit fee driver proposed by Simunic (1980) is legal liability: expected loss from an audit failure. This determinant of fees is affected by the provisions of SOX that created a change in the regulatory regime in the US. SOX established the PCAOB with the main purpose of improving the quality of audits. SOX also required all auditors of SEC registrants to register with the PCAOB. The PCAOB has the authority to conduct inspections and investigations concerning registered public accounting firms, and enforce their compliance with SOX. Therefore all PCAOB registered audit firms, regardless of size, faced increased quality

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requirements after the passage of SOX.  All else equal, increased quality requirements could lead

to higher chances of audit failures, which could in its turn lead to litigation.  SOX further

strengthened the law enforcement power of the SEC.  SOX Section 308(a) established Fair

Funds, which are the funds that the SEC can distribute to defrauded investors.  Prior to SOX, the

SEC could only distribute disgorgements to investors. Now, the SEC can distribute penalties in

addition to disgorgements.  This increase of potential civil payouts to investors could mean

larger settlements from law suits against auditors.  So creation of the PCAOB increased the

chance of litigation against an audit firm, and new enforcement powers of the SEC increased the

potential legal settlement against auditors.  As such audit firms have higher liability after SOX,

and so I argue that SOX created a regulatory regime change with respect to auditors' legal

liability, that would also lead to an increase in the work performed by auditors.

While Simunic (1980) proposes that there are two primary cost drivers – effort and

litigation – these two functions are not necessarily independent.  For example, fear of litigation

or other government intervention can cause auditors to increase audit effort in an attempt to

improve audit quality and, presumably, reduce the likelihood of costly external intervention

either through the courts (litigation) or through governmental oversight (e.g. costs related to an

unfavorable PCAOB inspection).  Thus, although effort and litigation are separate cost factors, it

is recognized that they are inter-related.

*Prior research*

Early audit market research established the existence of the Big 4 fee premium (Francis,

1984; Francis and Stokes, 1986; Francis and Simon, 1987).  Since that time, the premium has

been a focus of a number of published works (e.g. Choi et al., 2010, Choi et al., 2008; Basioudis

and Franics, 2007) and been used as a control variable in dozens more (e.g., Whisenant et al.,

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2003; Geiger and Rama, 2003; Craswell et al., 1995). This study extends that prior work by examining factors that drive the magnitude of the premium (e.g. regulation and client portfolio composition).

In more recent work, Ghosh and Pawlewicz (2009) (G&P) investigated the impact of SOX on audit fees. Using a sample drawn from 2000-2005, they find that the Big 4 clients have paid 43% more audit fees in the post-SOX compared to the pre-SOX environment. One of the largest drivers of the post-SOX increase in audit fees is Section 404(b) implementation, as shown by Raghunandan and Rama (2006) and Bhamornsiri et al. (2009). Implementation of 404(b) became mandatory in 2004 for large accelerated and accelerated filers. A large accelerated filer is defined by the SEC as an issuer "with the market cap of $700 million or more. Further, an accelerated filer is defined as an issuer with the market cap of $75 million or more", (SEC, 2005). Given their size and complexity, these registrants are more likely to have Big 4 auditors. SOX 404(b) compliance for other filers (non-accelerated filers) was postponed several times, and finally eliminated by the Dodd-Frank Act[2]. Non-accelerated filers are smaller (public float of under $75 million) and typically less complex. As such they are more likely (in comparison to accelerated filers and large accelerated filers) to have non-Big 4 auditors.

As argued earlier, the provisions of SOX that have made the most impact on audit fees are Section 404(b) requirements and the regulatory regime change brought about by the creation of the PCAOB. The design used by G&P contains a potential confound based on inherent differences in the client bases of the Big 4 and non-Big 4 firms. Specifically, it considers audit fees paid by the Big 4 clients (including many large accelerated and accelerated filers) which

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[2] While a number of non-accelerated filers voluntarily complied with Section 404(b), they started complying later, and less than 3% voluntarily complied before 2006 (based on the SOX 404(b) compliance data from Audit Analytics and market capitalization data from Compustat).

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were affected by both the regulatory regime change and Section 404, and compares those fees to audit fees of non-Big 4 clients which, at that point in time, were affected by the regulatory regime change, but (as those client portfolios were dominated by non-accelerated filers) were not as affected by Section 404 adoption. As such, the results in G&P could be biased in favor of finding large fee increases for the Big 4 firms merely because a disproportionate number of Big 4 clients had incurred 404(b) costs. The current study differs from G&P in that the sample is restricted to include only the companies which complied with SOX 404, *and* were not in the initial year of SOX adoption (because the first year of SOX 404 compliance is associated with abnormally large fees, as found in Bhamornsiri et al., 2009). This means that the vast majority of observations in the current study are from the years after 2004, which mitigates the bias resulting from the extraordinary high initial costs of implementing SOX 404(b).

Griffin and Lont (2007) also investigate the impact of SOX on audit fees. Their results show that audit fees have increased after the passage of SOX due to increased audit risk and increased audit effort, which is consistent with the claim that SOX led to increased fees by increasing auditor's potential legal liability and requiring additional procedures. They restrict their sample to only the Big 4 clients in their analysis, and as such do not investigate the Big 4 versus non-Big 4 difference.

Carson et al. (2012) investigate changes in the Big 4 fee premium over time and show that the premium has increased from the Big 6 period to the Big 5 and Big 4 periods using a sample of Australian firms from 1996-2007. The current study differs from Carson et al. (2012) by focusing primarily on the post-SOX period and the US setting.

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*Hypothesis development*

There are two theoretical perspectives on why SOX would have a differential effect on the fee changes by the Big 4 versus non-Big4 firms, and they lead to opposite predictions.

*Investment in quality*

The first perspective centers on the argument that the Big 4 fee premium is driven by the decision/need to invest in higher quality auditing.  In accordance with this perspective, it is argued that the Big 4 have always provided higher quality audits than non-Big 4 firms (Lennox, 1999).  Thus, SOX, which requires higher quality (and more expensive) audits, is predicted to have a relatively smaller effect on the fees of Big 4 firms than on the fees of non-Big 4 firms. For example: assume that prior to SOX, Big 4 firms were providing the market with audits of quality "X" and non-Big 4 firms were providing the market with audits of quality "Y", where $Y<X$.  Then, assume that the PCAOB sets a new minimum audit quality standard of "Z" where $Z>X>Y$.  In this case, both the Big 4 firms and non-Big 4 firms will need to improve their quality levels.  However, the Big 4 will have to improve by a smaller amount as X is closer to Z than is Y.  Thus, if the level of improvement required by the Big 4 is, on average, less than that required by non-Big 4, it should require a smaller increase in effort and cost on the part of Big 4 firms. This, in turn, should lead to smaller fee increases for Big 4 than non-Big 4 firms after SOX.

Along these lines, Choi et al (2008) studied the effect of a legal liability regime on audit fees internationally.  They argue that regardless of the regulatory regime, the Big 4 firms have greater resources at their disposal, and they are able to use these resources to engage in greater effort, presumably resulting in higher quality audits.  Simultaneously, the existence of greater resources also increases the likelihood that that these auditors will be viewed as a source of

"deep pockets" in case of an audit failure.  The heightened risk of litigation would provide a further incentive to provide high quality audit services.

These two factors, in combination, lead to an expectation of high quality work on the part of the Big 4 audit firms even in the pre-SOX environment.  Under this line of argument, and consistent with Choi et al. (2008), the Big 4 are assumed to be conducting high quality audits under any regulatory regime.  Therefore there may have been relatively less need to change the level of effort in the post-SOX environment (i.e. relative to the changes required of the non-Big 4 firms).  As such, under this perspective, the Big 4 are expected to have relatively smaller increases in audit fees in the post-SOX environment.

With respect to non-Big 4 firms, this perspective also focuses on resources available to be deployed to perform high quality audits.  Specifically, non-Big 4 firms have fewer resources to invest in audits than the Big 4, which ceterus paribus would presumably lead to having lower audit quality than the Big 4.  Prior research provides evidence consistent with the claim that non-Big 4 firms have lower audit quality (Lennox, 1999), and thus, a higher likelihood of an audit failure.  Once the regulatory regime changed, SOX increased legal liability and the threat of PCAOB inspections/sanctions created stricter audit requirements.  Under these new conditions, non-Big 4 firms had to make significant adjustments to increase the quality of their audits and reduce litigation risks.  This raises the possibility that in the post-SOX environment, non-Big 4 firms had to significantly increase effort to perform higher quality work, which would lead to a significant increase in fees.  Several post-SOX papers confirm significant improvements in audit quality in second tier firms (Peltier, 2012; Boone et al., 2010).  Importantly, this perspective focuses on the presumptions that, while all firms would need to increase effort post-SOX, non-Big 4 firms would be required to make a relatively greater increase in effort to achieve minimum

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PCAOB expectations. In essence, non-Big 4 firms are hypothesized to have relatively higher effort (and therefore fees) as they work to catch up to the enhanced quality expectations brought about by SOX. This view suggests that non-Big 4 firms will increase the fees more than the Big 4 after the passage of SOX.

*Market structure arguments*

The second theoretical view presents an opposing view. This perspective is based more on arguments of market structure and the role that such structure has on competition and pricing. Here, the argument is based on the existence of a bifurcated market for audit services. In one segment of the market, an oligopoly prevails whereas, in the other segment, producers face a more competitive structure. As described below, these differences in market structure and competition have implications for the pricing (and the SOX-driven changes in pricing) of audit services.

With respect to market structure, the upper-end of the audit market (the largest clients) is characterized as being dominated by the Big 4 firms, which audit 98% of the largest 1500 companies in the US (US Treasury, 2008). The market for smaller clients is not as highly concentrated. The Big 4 audit approximately 22% of companies with sales of less than $100 million, and 71% of the clients with sales between $100 million and $500 million (US Treasury, 2008). So, as suggested by Simunic (1980) and Ghosh and Lustgarten (2006), the audit market can be characterized as being comprised of two distinct segments: one more oligopolistic and the other more atomistic in nature. The segment which consists of large clients is dominated by only four providers – the Big 4. Thus it is oligopolistic. The atomistic segment refers to the medium and especially the small client segment where there are many more audit firms and thus the Big 4 – or any other provider – are likely to have less pricing power.

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The economics of market structure posits that the firms in an oligopoly are price setters, as opposed to price takes (which would be the case in more competitive environments). One of the main concerns related to the oligopolistic market structure is a possibility of collusion (Cox, 2006). Collusion can be explicit and implicit. Explicit collusion "exists when firms directly negotiate production output and pricing agreements in order to reduce competition", but such behavior is largely prohibited by anti-trust laws (Hoskisson et al., 2008, p. 195). Implicit or tacit collusion "exists when several firms in an industry coordinate their production and pricing decisions by observance of each other's competitive actions and responses". Tacit collusion is common in highly concentrated industries and assumes interdependence of firms (Hoskisson et al., 2008, p. 195).

The oligopolistic segment of the audit market is highly concentrated (as noted earlier). Furthermore, one of the characteristics of this oligopolistic segment of the market is the interdependence of the Big 4 firms. Examples of this interdependence are bidding for the same clients and recruiting the same talent from universities. As such, the structure of the oligopolistic segment of the audit market fits the characteristics of an industry where tacit collusion can take place. This is relevant to pricing because tacit collusion has been shown to lead to abnormally high prices (Hoskisson et al., 2008, p. 195). This leads to an assumption that audit fees would be increasing at a higher rate in the oligopolistic segment of the market. Further, since this segment is presumably dominated by price setting on the part of the Big 4 firms, fee increases would be higher for the Big 4 than non-Big 4 firms.

Furthermore, SOX has changed the regulatory regime and increased legal liability of all accounting firms. Associated potential legal liability costs are higher for the Big 4 firms because they have more resources to pay legal settlements. The Big 4 also have higher reputations at

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stake in case of any audit failure (DeAngelo, 1981).  As such the Big 4 firms could be expected to increase their effort more than non-Big 4 to avoid any possible litigation; increased effort is expected to lead to increased audit fees.  As such, this view suggests that after the passage of SOX, the Big 4 would increase audit fees more than non-Big 4.

Since there are two theoretical views on the differential impact of SOX on Big4 and non-Big4 firms – investment in quality and market structure – I state my hypothesis in null form:

**H1: In the post-SOX environment there will be no significant difference in the rate of increase of audit fees between the Big 4 and non-Big 4 firms.**

## Client Segments

As noted previously, in addition to examining the relative differences in changes in fees between Big 4 and non-Big 4 firms, this paper also examines whether certain types of clients are driving those differences.  Specifically, I consider the likelihood that client size is an important factor in understanding the nature of changes in fee premium.  As in the previous section, I present two opposing theoretical perspectives which yield competing expectations.

### *Consumer surplus*

"The excess of the price which he would be willing to pay rather than go without the thing, over that which he actually does pay, is the economic measure of this surplus satisfaction. It may be called consumer's surplus"

(Marshall, 1890).

Due to the fee negotiation process and imperfect information that the audit firm has about the client (the firm cannot objectively determine exactly how much a client would be willing to

pay), the firms do not always end up charging the maximum fees that the client would be willing to pay. As such, consumer surplus, noted in the quote by Marshall above, exists in the audit market. Specifically, this refers to the difference between the audit fee that a client would be willing to pay and the audit fee the client actually pays.

If a client determines that its audit fee is too high, it is more likely to switch audit firms. This practice is more common for small clients due to their small size and low complexity (Ghosh and Lustgarten, 2006). For example, there is a large number of smaller registrants who do not need a Big 4 audit firm or even a regional accounting firm. Audits of small and simple clients can be performed by many local firms. Thus, there is a greater number of firms that can reasonably be expected to compete for the business of such clients. Furthermore, demands of small clients may be more price elastic, i.e., they are more sensitive to price increases because they have fewer resources. Therefore such clients have more audit firm choices and may be more likely to search for a less costly alternative if the price is increasing.

Here it is assumed that audit firms obtain consumer surplus by third degree price discrimination[3], which "results when a firm sets a different price for different groups of

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[3] Consumer surplus can be captured using price discrimination, which has four forms. First degree price discrimination takes place in markets where the seller knows and is able to charge the maximum price that a consumer is willing to pay. Second degree price discrimination takes place when a seller charges different prices for different quantities of products or services (e.g. charging less per unit when multiple units are purchased). Third degree price discrimination refers to charging different customers different prices. Finally, fourth degree price discrimination takes place where the seller charges all customers the same price, but costs of production are different (e.g. a movie theater charges the same price for tickets, however having accommodations for patrons in wheelchairs costs more to build).

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customers" (Hirschey, 2008, p. 592)[4,5]. Thus, it is assumed that these "groups of customers" in the audit market are clients that are grouped or characterized by demand elasticities. As argued above, small clients are assumed to have more elastic demands than large clients. Elasticity of demand refers to how responsive the quantity demanded is to the change in price of the product. Coincidentally, large clients have more resources to spare and thus are assumed to be more inelastic in their demand for audit services. As such when the audit firm negotiates for a higher fee, large clients are more likely to be able to afford this increase than are the small clients. So a large client may be more likely (relative to a smaller client) to be willing to accept a higher fee. Therefore, it is likely that large clients have more consumer surplus. This leads to an expectation that audit firms will try to increase their revenues by targeting the surplus from large clients. This leads to a prediction that the large clients, which are primarily audited by the Big 4 firms, will experience significant fee increases.

*Client importance*

The second theoretical view in this section is based on the idea of client importance: firms are interested in keeping their large clients because a large portion of a firm's revenue comes from such clients (Gul et al., 2007; Craswell et al., 2002). Since SOX changed the regulatory regime and added a number of requirements which increased the firms' liability exposure and effort, as noted earlier, audit firms will not keep their fee consistent with pre-SOX rates. There will be an increase in fees. However, under this second line of reasoning, firms will be reluctant to increase fees for large clients because there is a risk that they will switch firms,

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[4] This study focuses on fee changes as opposed to fee levels. Thus the term third degree price discrimination is used to reference changing fees at a different rate for different groups of customers.
[5] Audit firms are assumed to offer services of the same quality to all clients because audit firms are assumed to have the same quality standards for audits regardless of the size and type of the client.

which would lead to significant losses to an audit firm.  Given that audit firms are interested in keeping their large clients, but still need to increase their fees, this leads to the prediction that audit firms will have relatively greater fee increase for their small clients than for their large clients[6].  This is consistent with the results in Carson et al. (2012) who also show that the premium increases in the Big 4 period have been lower for global clients.

Since there are two theoretical views on the phenomenon I state my hypothesis in null form:

**H2: In the post-SOX environment there will be no significant difference between the rate of annual fee changes for large and small clients.**

## Methods

To test these two hypotheses, I use the following regression equation:

$$\Delta FEE = \beta_0 + \beta_1 BIG4 + \beta_2 CLIENTIMPORT + \beta_3 CLIENTIMPORT*BIG4 + \beta_4 \Delta SIZE + \beta_5 \Delta INVREC + \beta_6 \Delta SEG + \beta_7 \Delta ROA + \beta_8 \Delta LEV + \beta_9 LP + \beta_{10} PL + \beta_{11} FN + \beta_{12} NF + \beta_{13} EN + \beta_{14} NE + \text{year fixed effects} + \varepsilon \qquad (1)$$

Where:

$\Delta$ = percentage change in the variable since prior year;

FEE = audit fees;

BIG4 = indicator variable coded 1 for a Big 4 firm and 0 otherwise;

CLIENTIMPORT = audit fees paid by each client divided by the total audit fees received by the audit firm;

SIZE = total assets;

INVREC= inventory plus accounts receivable divided by total assets;

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[6] This is also consistent with the client bargaining power argument, where large clients have greater bargaining power than small clients (Casterella et al., 2004).

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SEG = total segments[7];

ROA = net income before extraordinary items and discontinued operations divided by average total assets;

LEV = total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had a loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies that paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies that did not pay foreign tax in the prior year but paid foreign tax in the current year;

EN = indicator variable coded 1 for companies which had effective internal controls in the current year and had ineffective controls in the prior year;

NE = indicator variable coded 1 for companies which had ineffective controls in the prior year and had effective controls in the current year;

Fixed effects = year indicator variables.

BIG4 is the independent variable used to test H1, since competing theoretical views are provided I do not predict the sign of $\beta_1$. A positive coefficient on BIG4 would be consistent with the oligopolistic structure of the market for the services of the Big 4 firms, where the firms have more pricing power, and this can increase their prices. A negative coefficient on Big 4 would be consistent with the investment in quality argument where non-Big 4 firms had to make more substantial changes in their audit efforts after SOX as compared to the Big 4.

CLIENTIMPORT is the independent variable used to test H2. Because competing theoretical views are presented, I do not provide a prediction on the sign of $\beta_2$. A positive coefficient would be consistent with the consumer surplus theoretical view, where audit firms

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[7] I assigned the value of 1 to all cases where segment data were missing, which is consistent with Francis and (2009) and Choi et al. (2012)

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capture the consumer surplus of their largest clients, who have more resources.  On the other hand, a negative coefficient would support the client importance view, where the firms do not increase the fees of their large clients for fear of losing them.

SIZE is included in the model and has been shown to be the primary driver of audit fees. The expected sign for SIZE is positive (Simunic, 1980; Francis et al., 2005; Choi et al., 2010; Charles et al., 2010).  SEG and FN (NF) are included to proxy for the complexity of a client. Clients with multiple segments require more audit effort, thus the expected coefficient of SEG is positive.  Clients with foreign operations also require additional audit effort.  As such, if a company goes from not having foreign operations to having them (NF), the complexity of the company increases, thus the expected coefficient of NF is positive.  Consequently, the expected coefficient of FN (i.e. a change from having foreign operations to *not* having foreign operations) is negative (Choi et al., 2010; Ghosh and Lustgarten, 2006; Simunic, 1980).

Following prior research, INVREC, ROA, LEV, LP (PL), NE (EN) are included as proxies for client risk.  Inventories and receivables are considered high risk items; highly leveraged clients are also considered to be risky, thus they require more audit effort. Therefore, the expected coefficients on INVREC  and LEV are positive (Choi et al., 2010; Ghosh and Pawlewicz, 2009).  Profitable clients have lower risk.  Thus, expected coefficients on ROA and LP (a year with a loss followed by a year with no loss) are negative, and the expected coefficient on PL (year with no loss followed by a year with a loss) is positive (Ghosh and Lustgarten, 2006).  Finally, clients with ineffective internal controls are risky.  Furthermore audit firms have to perform additional procedures to address internal control deficiencies. Therefore, the expected coefficient on EN (a year with effective controls followed by a year with ineffective controls) is positive, and NE is negative (Hoitash et al., 2008; Raghunandan and Rama, 2006).

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## Results

*Sample, descriptive statistics and univariate tests.*

Audit fee data was obtained from Audit Analytics and financial data was obtained from

Compustat. The sample excludes observations that:

1) have less than two consecutive years of fee or control variable data, since that is required to perform a change analysis.

2) do not comply with Section 404(b). Compliance has been one of the two main sources of fee increases after SOX, and including the companies that do not comply potentially biases the results.

3) are in the first year of 404(b) compliance, because the fees are disproportionally higher in the first year of compliance (Bhamornsiri et al.,2009).

4) represent initial audit engagements, because prior research found lowballing in first year engagements (Francis, 1984; Francis and Simon, 1987).

5) are non-US companies, because the US companies are the ones primarily affected by SOX[8].

The final sample includes observations from fiscal years 2005-2011. Earlier years are not

included due to the fact that SOX 404(b) compliance became mandatory starting in 2004 for

large accelerated and accelerated filers, and I exclude first year of compliance due to

disproportionally higher fees in the first year of compliance (Bhamornsiri et al.,2009).

Descriptive statistics and univariate tests are included in Table 1. All variables are

winsorized at the 1st and 99th percentiles. The final sample consists of 17,890 observations,

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[8] While non US companies were affected by SOX (multinationals, subsidiaries), enhancing practices worldwide, it is not clear when the changes took place or the extent to which the changes occurred uniformly. Thus, non-US firms were excluded in an attempt to reduce nonsystematic variation.

15,060 are Big 4 clients and 2,830 are non-Big 4 clients. Average annual change in audit fees is 4.8% in the overall sample, 4.2% for the Big 4 clients and 7.6% for non-Big 4 clients. Univariate tests show that non-Big 4 clients have experienced significantly higher fee changes than the Big4. The mean ratio of fees received from each client to the total received by each firm is 1.1% with significant differences between the Big 4 (less than 1%) and non-Big 4 firms (6.5%). These differences are primarily driven by the portfolio sizes of the Big 4 and non-Big 4 firms. The Big 4 firms have hundreds of clients, and as such, on average, fees received from each client amount to a smaller fraction of the total portfolio. On the other hand, small firms may have only a few public clients. Consequently each client would be a relatively large portion of the portfolio.

Table 2 presents a correlation matrix. There is a significant negative association between CLIENTIMPORT and BIG4 (rho=-0.49). There is also a correlation of 0.28 between FEE and SIZE, a 0.26 correlation between BIG4 and CLIENTIMPORT*BIG4 interaction, a -0.25 correlation between ROA and LP, as well as a -0.39 correlation between ROA and PL. However beyond these associations, no other correlations exceeded 0.17. Further, subsequent analyses do not indicate that multicollinearity poses a significant problem, as none of the variance inflation factors (VIF) exceeded the threshold of 10 (the highest VIF was 3.95).

*Multivariate results.*

Results of a pooled cross sectional OLS regression are presented in Table 3. The regression equation is estimated using robust standard errors and clustering by company. Recall that Hypothesis 1 focuses on the differences in the rate of increase of audit fees between the Big 4 and non-Big 4 firms. The coefficient of BIG4 is significantly negative (t= -4.30), and as such, null hypothesis 1 is rejected. This result indicates that in the post-SOX environment, non-Big 4

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firms have been increasing their fees at a higher rate than the Big 4 firms, which is consistent with the proposition that the Big 4 fee premium has been diminishing. Specifically, the results suggest that when SOX created higher quality control standards for audits, non-Big 4 firms had to make more significant adjustments to comply with the new requirements than the Big 4. These adjustments meant more effort, and thus higher fees charged by the non-Big 4 firms.

The purpose of hypothesis 2 is to investigate whether the small or the large clients (as compared to other companies in the firm's portfolio) drive the annual fee changes. The coefficient of CLIENTIMPORT is significantly positive (t=3.42). Thus null hypothesis 2 is rejected. This suggests that the annual change in audit fees is driven primarily by firms' largest clients. This is consistent with the consumer surplus theoretical argument presented in the theory section: audit firms seem to increase fees by capturing consumer surplus from their largest clients, who have the most resources. The interaction between client size and the Big 4 is significantly positive (t=6.16), which indicates that the effect of client size is more pronounced for the Big 4 firms.

Most control variables are also significant in the predicted direction. Change in audit fees is positively associated with the increase in company's assets, the increase in the ratio of inventory and receivables to total assets, and an increase in leverage. The fees also increase when a company goes from a profitable year to reporting a loss and from not having foreign operations to having them. Audit fees decrease when a company goes from having a loss to being profitable and when a company goes from having foreign operations to not having them.

*Additional analyses*

I re-estimated the model using two different client size measures: total fees (audit plus non-audit) received from the client as a percentage of total fees received by the firm and non-audit fee from the client divided by total fees received by the firm, which is consistent with Gul et al. (2007) and Lim and Tan (2010). As noted earlier, the two theoretical views on the relationship between client size and annual change in audit fees are related to dependency on the client or consumer surplus. Prior research used non-audit fees as measures of auditor independence, or how much a firm is dependent on a client (Gul et al., 2007). Non-audit fees can also be used as a measure of a client's consumer surplus because large clients with a lot of resources and thus more consumer surplus, can afford more non-audit services. Results (untabulated) using these two non-audit fee measures are qualitatively the same.

Prior research has suggested that audit firm tenure can be a driver of audit fees. If a company has been audited by the same firm for a number of years, the auditor is likely to have a very good understanding of the company, which would lead to efficiencies in the audit prices and therefore, lower audit fees. Consequently if the audit firm is new, the auditors are assumed to be familiarizing themselves with their client, which could lead to inefficiencies in audit procedures and thus higher fees. On the other hand if a client-auditor relationship is long, the audit firm can potentially use that as leverage in negotiating a higher fee. In order to address the impact of the auditor tenure on the annual audit fee changes I re-estimate regression equation 1 with four different measures of audit tenure (as used by Gul et al., 2007; Lim and Tan, 2010): the number of years with the current audit firm, natural log of the number of years, dummy variable coded one if tenure is three years or less and zero otherwise, two dummy variables (tenure is three years

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or less, and nine years or more).  Most tenure variables are significant, and the results for both

BIG4 and CLIENTIMPORT (untabulated) remain qualitatively the same.

As noted earlier, the Big 4 and non-Big 4 firms have very different sizes of client

portfolios.  As such, I re-estimate the model separately for Big 4 and non-Big 4 clients.  The

results (untabulated) show that CLIENTIMPORT is significant in both sub-samples: t=4.94 for

the Big 4 clients and t=3.28 for non-Big 4 clients.  I also re-estimated the model excluding one

year at a time to see if the results are driven by only one year. The results remained qualitatively

the same.

Since BIG4 and CLIENTIMPORT are relatively highly correlated (-0.4885), I re-

estimate the model using a different measure of client size.  Instead of using a continuous

variable for client size, I use quintiles.  I created four dummy variables for quintiles five through

two and re-estimated the regression equation as follows:

$$\Delta FEE = \beta_0 + \beta_1 BIG4 + \beta_2 Q5 + \beta_3 Q4 + \beta_4 Q3 + \beta_5 Q2 + \beta_6 Q5*BIG4 + \beta_7 Q4*BIG4 + \beta_8 Q3*BIG4 + \beta_9 Q2*BIG4 + \beta_{10}\Delta SIZE + \beta_{11}\Delta INVREC + \beta_{12}\Delta SEG + \beta_{13}\Delta ROA + \beta_{14}\Delta LEV + \beta_{15}LP + \beta_{16}PL + \beta_{17}FN + \beta_{18}NF + \beta_{19}EN + \beta_{20}NE + year\ fixed\ effects + \varepsilon$$
(2)

Q5, Q4, Q3, Q2 refer to dummy variables representing quintiles five (Q5) through two

(Q2); quintiles are based on the size of the client in the audit firm's portfolio each year.  Quintile

5 has the largest clients (as compared to other companies in the portfolio of each audit firm in a

given year), and quintile 1 has the smallest.  If a firm had less than 5 clients in a given year, the

largest client is assigned to quintile 5, second largest is assigned to quintile 4, etc.  All other

variables are as previously defined..

Interaction variables in the model had VIF's over the threshold of 10 suggesting

multicollinearity problems.  Consequently, I re-estimated the model without the interaction

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variables.  The coefficient on BIG4 remains significantly negative (t=-4.68), and coefficients on

quintiles five, four and three are significantly positive (t values of 7.81, 6.50, and 2.46

respectively.  Further, coefficients on quintiles of five, four, and three are 0.0423, 0.0369, 0.0132

respectively).  I also re-estimated the regression equation after excluding all firms which did not

have at least five clients in their audit portfolios.  The results remained qualitatively the same.

As such, using quintile dummies for client size does not change the results which show a

diminishing Big 4 premium in the post-SOX environment and higher annual audit fee changes

for the large clients.

*The PCAOB Effect*

This study is focused on the post-SOX period.  Theoretical arguments presented earlier

are based on the assertion that SOX has changed the regulatory environment.  As argued in the

theory section SOX created a regulatory regime change, primarily driven by the creation of the

PCAOB.  As such the passage of SOX itself might not have directly changed the regulatory

regime, but did so indirectly through the PCAOB inspections.  In order to test this notion I

conduct an event study using the following equation:

$$\Delta FEE = \beta_0 + \beta_1 BIGN + \beta_2 PCAOB + \beta_3 BIGN*PCAOB + \beta_4 CLIENTIMPORT + \beta_5 CLIENTIMPORT*BIGN + \beta_6 \Delta SIZE + \beta_7 \Delta INVREC + \beta_8 \Delta ROA + \beta_9 \Delta LEV + \beta_{10} LP + \beta_{11} PL + \beta_{12} FN + \beta_{13} NF + \beta_{14} INITIAL404B + \beta_{15} NEWAUD + \beta_{16} CRISIS + \varepsilon \qquad (3)$$

Where:

BIGN = indicator variable coded 1 for a Big 5 firm (since Arthur Andersen was still in existence before 2002) and 0 otherwise;

PCAOB = indicator variable coded 1 if fiscal year end is after 2002 and a company is audited by a Big 4 firm or if fiscal year is after 2003 and a company is audited by a non-Big 4 firm;[9]

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[9] I have also re-estimated Equation 3 replacing the variable PCAOB with SOX, which was coded 1 for all years after 2001; this was done to analyze the effect of the passage of the Act itself on

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INITIAL404B = indicator variable coded 1 if the observation represents a company that had undergone its initial 404(b) engagement in that year and 0 otherwise;

NEWAUD = indicator variable coded 1 if the observation represents the first year of the auditor-client relationship and 0 otherwise;

CRISIS = 1 if the years are 2007-2009 and 0 otherwise.  Since PCAOB controls for the years after 2002 or 2003 (depending on the size of the auditor) I do not include year fixed effects to avoid over specifying the model.  Instead I am adding this variable to control for the effects of the global financial crisis.

Variables CLIENTIMPORT, SIZE, INVREC, ROA, LEV, LP, PL, FN, NF were described in

Equation 1.


The reason for the difference in the Big 4 and non-Big 4 coding of the variable PCAOB

is driven by the fact that the PCAOB conducted its very first inspections in 2003, but in that year,

the PCAOB inspected only the Big 4 firms.  Inspections for non-Big 4 firms started in 2004.  As

such, it is likely that the effect of the regulatory change caused by the PCAOB inspections

affected the Big 4 and non-Big 4 at different times[10].  Since I am primarily interested in the

differential impact of the Sarbanes Oxley Act (through the PCAOB regulatory inspections) on

the fees charged by the Big 4 and non-Big 4 firms, my main variable of interest in Equation 3 is

the interaction between BIGN and PCAOB.  A positive coefficient would be consistent with the

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the rate of change of audit fees.  Interaction between BIGN and SOX was highly correlated with main effects (VIF's over 10); therefore Equation 3 was re-estimated using mean-centered BIGN and SOX.  The results (untabulated) were qualitatively similar to those reported in Table 5. However, it is important to note that one of the limitations of investigating audit fees before and after SOX is the fact that fee disclosure data is available for only a limited time in the pre-SOX period.

[10] Per review of the PCAOB inspection reports on the PCAOB.org website, the reports in 2003 were titled "Limited Inspection", and the reports starting in 2004 no longer indicated that they were "limited".  Consequently it is possible that the full effect of the PCAOB inspection reports did not start until the reports were no longer limited.  This means that the effect would start in 2004 for the Big 4 as well as non-Big 4.  I re-estimated Equation 3 coding PCAOB 1 for the years after 2003 for both the Big 4 and non-Big 4. The results (untabulated) for BIGN and BIGN*PCAOB were qualitatively unchanged, however the main effect of PCAOB was no longer significant.

asserion that after the PCAOB started conducting its inspections, the Big 4 firms further increased their fee premium, which would be consistent with the assertion that the Big 4 potentially strengthened their oligopolistic powers in the post-SOX environment. On the other hand, a negative coefficient would indicate that the PACOB inspections increased the fees of the non-Big 4 firms, which would be consistent with the investment in quality argument.

CRISIS is included in the model to control for the years of the global financial crisis (2007-2009). Anecdotal evidence suggests that the financial crisis put a significant downward pressure on the audit fees regardless of the size of the audit firm, because the firms had to be responsive to the financial difficulties faced by the clients.

The sample used to test Equation 3 consists of 49,603 observations from 2000-2011. Audit fee data were not generally publicly reported and therefore are unavailable in Audit Analytics before 2000. The results are presented in Table 5. The coefficients of CLIENTIMPORT and CLIENTIMPORT*BIGN are both significantly positive. These findings are consistent with the results in the main analysis section and provide additional evidence indicating that the changes in audit fees are driven primarily by the large clients. The significant interaction suggests that this finding is more evident for the Big 4 firms. This further provides support for the consumer surplus theoretical reasoning.

The coefficient on BIGN is significantly positive (t=8.81), which indicates that during the 2000-2011 sample period, which includes pre-SOX as well as post-SOX, the Big N firms have increased their fees are a higher rate than non-Big N firms. This finding seems inconsistent with the primary findings presented in Tables 3 and 4. However, the primary analysis examines data from 2005-2011. Thus the difference in findings is likely driven by the difference in sample

periods. Evidence supporting this assertion is provided by the significantly negative coefficient on the BIGN*PCAOB variable. I also re-estimated the model separately for 2000-2004 and 2005-2011 periods. The coefficient on BIGN was significantly positive in the 2000-2004 period and significantly negative in the 2005-2011 period. This finding suggests that in the period subsequent to the initiation of the PCAOB inspections, clients of non-Big 4 firms have experienced greater fee increases. Thus these findings are consistent with the primary analysis and supporting of the "investment in quality" perspective, where non-Big 4 firms had to make significant improvements in their audit procedures to comply with new auditing requirements.

<div align="center">Conclusion</div>

The purpose of this paper is two-fold. First, I investigate the changes in the Big 4 fee premium after the passage of SOX. Second, I investigate whether annual audit fee changes differ based on the size of the client relative to the remainder of the audit firm's portfolio. The results show that, in the post SOX environment, clients of non-Big 4 firms have experienced larger annual audit fee increases than the clients of the Big 4 firms. This suggests that the Big 4 fee premium has diminished after SOX. This is consistent with the investment in quality theoretical view: even in the pre-SOX environment, the Big 4 had more resources to invest in their audits; they can also be viewed as sources of "deep pockets" in litigations. As such the Big 4 are expected to perform high quality audits regardless of the regulatory regime. On the other hand non-Big 4 have fewer resources to invest in audits, which could lead in lower quality audits, as compared to the Big 4. Thus, in the post-SOX environment, when legal liability and regulatory scrutiny was increased, the non-Big 4 had to make a larger adjustment to their audits than the Big 4 in order to comply with new requirements. Therefore non-Big 4 firms had to

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increase their effort (and subsequently the fees that they charge their clients) relatively more than the Big 4. This extends the work by Ghosh and Pawlewicz (2009) and Grifin and Lont (2007) by investigating the Big 4 fee premium in the post-SOX environment. This finding contributes to our understanding of the impact of a major change in the regulatory regime on audit fees.

I also find that audit fee increases are driven primarily by the large clients in the audit firm portfolio. This is consistent with the consumer surplus theoretical argument: large companies have more financial resources and their demands for audit services are less elastic. Small clients are presumably more likely to switch audit firms if the firm increases the fees because such clients have less financial resources (and therefore less consumer surplus) and consequently more elastic demands. Therefore if an audit firm increases their fees, large clients are more likely to agree to pay such fees than smaller companies. This finding suggests that audit firms are able to increase their fees by capturing consumer surplus from their large clients. This result contributes to our understanding of the economics of the fee competition in the audit industry. This study also extends the work by Ghosh and Lustgarten (2006) by investigating which category of clients drives annual audit fee increases.

## Table 1 - Descriptive Statistics – Market Segmentation and Premium Pricing

| Variable | Full Sample N = 17,890 Mean | Std. Dev. | Big 4 N = 15,060 Mean | Std. Dev. | Non Big 4 N = 2,830 Mean | Std. Dev. | Difference |
|---|---|---|---|---|---|---|---|
| FEE | 0.0476 | 0.2574 | 0.0423 | 0.2512 | 0.0758 | 0.2865 | -0.0335*** |
| BIG4 | 0.8418 | 0.3649 | 1.0000 | 0.0000 | 0.0000 | 0.0000 | 1.0000 |
| CLIENTIMPORT | 0.0111 | 0.0476 | 0.0010 | 0.0019 | 0.0647 | 0.1044 | -0.0638*** |
| CLIENTIMPORT *BIG4 | 0.0008 | 0.0013 | 0.0009 | 0.0013 | 0.0000 | 0.0000 | 0.0009*** |
| SIZE | 0.0936 | 0.2728 | 0.0911 | 0.2664 | 0.1070 | 0.3043 | -0.0159*** |
| INVREC | 0.0372 | 0.3313 | 0.0365 | 0.3243 | 0.0405 | 0.3663 | -0.0039** |
| SEG | 0.0599 | 0.4358 | 0.0703 | 0.4488 | 0.0049 | 0.3542 | 0.0653*** |
| ROA | -0.3148 | 3.1534 | -0.2940 | 3.1413 | -0.4256 | 3.2157 | 0.1316** |
| LEV | 0.0445 | 0.2629 | 0.0430 | 0.2525 | 0.0524 | 0.3121 | -0.0095** |
| LP | 0.0783 | 0.2686 | 0.0787 | 0.2693 | 0.0760 | 0.2650 | 0.0027 |
| PL | 0.0932 | 0.2908 | 0.0901 | 0.2863 | 0.1099 | 0.3128 | -0.0198*** |
| FN | 0.0076 | 0.0869 | 0.0074 | 0.0855 | 0.0088 | 0.0936 | -0.0015 |
| NF | 0.0204 | 0.1414 | 0.0200 | 0.1400 | 0.0226 | 0.1487 | -0.0026 |
| EN | 0.0233 | 0.1509 | 0.0218 | 0.1462 | 0.0311 | 0.1736 | -0.0092*** |
| NE | 0.0363 | 0.1871 | 0.0334 | 0.1797 | 0.0519 | 0.2220 | -0.0185*** |

FEE = percentage change of audit fees;

BIG4 = indicator variable coded 1 for a Big 4 firm and 0 otherwise;

CLIENTIMPORT = assets of each client divided by the total assets audited by each firm;

SIZE = percentage change of total assets;

INVREC= percentage change of inventory plus accounts receivable divided by total assets;

SEG = percentage change of total segments;

ROA = percentage change of net income before extraordinary items and discontinued operations divided by average total assets;

LEV = percentage change of total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies which paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies which did not pay foreign tax in the prior year but paid foreign tax in the current year;

EN = indicator variable coded 1 for companies which had effective internal controls in the current year and had ineffective controls in the prior year;

NE = indicator variable coded 1 for companies which had ineffective controls in the prior year and had effective controls in the current year;

*, **, ***- Indicates significance at the 10%, 5%, and 1% level in a two-tailed t-test respectively.

**Table 2 - Correlation Matrix - Market Segmentation and Premium Pricing**

| | FEE | BIG4 | CLIENTI MPORT | CLIENTIMP ORT*BIG4 | SIZE | INVR EC | SEG |
|---|---|---|---|---|---|---|---|
| FEE | 1 | | | | | | |
| BIG4 | -0.0475 | 1 | | | | | |
| CLIENTIMPORT | 0.0551 | -0.4885 | 1 | | | | |
| CLIENTIMPORT *BIG4 | 0.0168 | 0.2635 | -0.0975 | 1 | | | |
| SIZE | 0.2839 | -0.0213 | 0.0256 | -0.0263 | 1 | | |
| INVREC | 0.0187 | -0.0043 | 0.0083 | -0.0363 | -0.1409 | 1 | |
| SEG | 0.1010 | 0.0547 | -0.0245 | -0.0020 | 0.0886 | 0.0308 | 1 |
| ROA | -0.0054 | 0.0152 | -0.0061 | 0.0027 | 0.0349 | -0.0235 | 0.0079 |
| LEV | 0.1088 | -0.0132 | 0.0150 | -0.0446 | 0.0685 | 0.1727 | 0.0306 |
| LP | -0.0454 | 0.0037 | -0.0135 | -0.0097 | 0.0191 | 0.0012 | -0.0437 |
| PL | 0.0384 | -0.0248 | 0.0034 | -0.0223 | -0.1109 | 0.0229 | -0.0161 |
| FN | -0.0158 | -0.0061 | 0.0041 | -0.0106 | -0.0242 | 0.024 | -0.0020 |
| NF | 0.0455 | -0.0068 | -0.0099 | -0.0315 | 0.0883 | 0.0279 | 0.0191 |
| NE | -0.0140 | -0.0362 | 0.0144 | 0.0008 | -0.0268 | 0.0124 | 0.0861 |
| EN | 0.1325 | -0.0224 | 0.0039 | -0.0127 | 0.0170 | 0.0023 | 0.0510 |

| | ROA | LEV | LP | PL | FN | NF | NE | EN |
|---|---|---|---|---|---|---|---|---|
| ROA | 1 | | | | | | | |
| LEV | -0.0266 | 1 | | | | | | |
| LP | -0.2507 | -0.0946 | 1 | | | | | |
| PL | -0.3959 | 0.0976 | -0.0934 | 1 | | | | |
| FN | -0.0022 | 0.0168 | 0.0080 | 0.0206 | 1 | | | |
| NF | -0.0057 | 0.0472 | 0.0183 | -0.0014 | -0.0126 | 1 | | |
| NE | -0.0033 | 0.0077 | 0.0124 | 0.0240 | 0.0243 | 0.0037 | 1 | |
| EN | -0.0223 | 0.0283 | -0.0023 | 0.0715 | 0.0078 | 0.0065 | -0.0300 | 1 |

FEE = percentage change of audit fees;

BIG4 = indicator variable coded 1 for a Big 4 firm and 0 otherwise;

CLIENTIMPORT = assets of each client divided by the total assets audited by each firm;

SIZE = percentage change of total assets;

INVREC= percentage change of inventory plus accounts receivable divided by total assets;

SEG = percentage change of total segments;

ROA = percentage change of net income before extraordinary items and discontinued operations divided by average total assets;

LEV = percentage change of total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies which paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies which did not pay foreign tax in the prior year but paid foreign tax in the current year;

EN = indicator variable coded 1 for companies which had effective internal controls in the current year and had ineffective controls in the prior year;

NE = indicator variable coded 1 for companies which had ineffective controls in the prior year and had effective controls in the current year.

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**Table 3 - Multivariate Results Using a Continuous Measure of Client Importance**

| FEE | Coefficient | t-statistic |
|---|---|---|
| BIG4 | -0.0253 | -4.30*** |
| CLIENTIMPORT | 0.1828 | 3.42*** |
| CLIENTIMPORT *BIG4 | 9.4025 | 6.16*** |
| SIZE | 0.2581 | 23.26*** |
| INVREC | 0.0314 | 4.34*** |
| SEG | 0.0115 | 1.42 |
| ROA | 0.0003 | 0.47 |
| LEV | 0.0618 | 6.41*** |
| LP | -0.0215 | -3.09*** |
| PL | 0.0532 | 6.77*** |
| FN | -0.0347 | -1.90* |
| NF | 0.0300 | 1.95* |
| EN | 0.1920 | 9.25*** |
| NE | -0.0237 | -1.76 |
| Constant | 0.0445 | 3.97*** |
| N | | 17,890 |
| $R^2$ | | 0.131 |

FEE = percentage change of audit fees;

BIG4 = indicator variable coded 1 for a Big 4 firm and 0 otherwise;

CLIENTIMPORT = assets of each client divided by the total assets audited by each firm;

SIZE = percentage change of total assets;

INVREC= percentage change of inventory plus accounts receivable divided by total assets;

SEG = percentage change of total segments;

ROA = percentage change of net income before extraordinary items and discontinued operations divided by average total assets;

LEV = percentage change of total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies which paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies which did not pay foreign tax in the prior year but paid foreign tax in the current year;

EN = indicator variable coded 1 for companies which had effective internal controls in the current year and had ineffective controls in the prior year;

NE = indicator variable coded 1 for companies which had ineffective controls in the prior year and had effective controls in the current year.

*, **, ***- Indicates significance at the 10%, 5%, and 1% level in a two-tailed test respectively.

**Table 4 - Multivariate Results Using Indicator Variables for Client Importance**

| FEE | Coefficient | t-statistic |
|---|---|---|
| BIG4 | -0.0242 | -4.68*** |
| Q5 | 0.0423 | 7.81*** |
| Q4 | 0.0369 | 6.50*** |
| Q3 | 0.0132 | 2.46** |
| Q2 | 0.0027 | 0.51 |
| SIZE | 0.2567 | 23.33*** |
| INVREC | 0.0326 | 4.53*** |
| SEG | 0.0103 | 1.27 |
| ROA | 0.0003 | 0.37 |
| LEV | 0.0635 | 6.59*** |
| LP | -0.0231 | -3.32*** |
| PL | 0.0513 | 6.56*** |
| FN | -0.0354 | -1.95* |
| NF | 0.0308 | 2.01** |
| EN | 0.1894 | 9.18*** |
| NE | -0.0261 | -1.93* |
| Constant | -0.0097 | 2.97*** |
| N | | 17,890 |
| $R^2$ | | 0.133 |

FEE = percentage change of audit fees;

BIG4 = indicator variable coded 1 for a Big 4 firm and 0 otherwise;

Q5 = indicator variable coded 1 if a company is in the fifth quintile;

Q4 = indicator variable coded 1 if a company is in the fourth quintile;

Q3 = indicator variable coded 1 if a company is in the third quintile;

Q2 = indicator variable coded 1 if a company is in the second quintile;

SIZE = percentage change of total assets;

INVREC= percentage change of inventory plus accounts receivable divided by total assets;

SEG = percentage change of total segments;

ROA = percentage change of net income before extraordinary items and discontinued operations divided by average total assets;

LEV = percentage change of total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies which paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies which did not pay foreign tax in the prior year but paid foreign tax in the current year;

EN = indicator variable coded 1 for companies which had effective internal controls in the current year and had ineffective controls in the prior year;

NE = indicator variable coded 1 for companies which had ineffective controls in the prior year and had effective controls in the current year.

*, **, ***- Indicates significance at the 10%, 5%, and 1% level in a two-tailed test respectively.

**Table 5 – Impact of the PCAOB**

| FEE | Coefficient | t-statistic |
|---|---|---|
| BIGN | 0.1029 | 8.81*** |
| PCAOB | 0.0238 | 2.14** |
| BIGN*PCAOB | -0.0537 | -4.15*** |
| CLIENTIMPORT | 0.0398 | 2.32** |
| CLIENTIMPORT *BIGN | 10.9268 | 3.70*** |
| SIZE | 0.3107 | 27.86*** |
| INVREC | 0.0300 | 5.06*** |
| ROA | 0.0018 | 1.95* |
| LEV | 0.0535 | 7.81*** |
| LP | -0.0483 | -5.12*** |
| PL | 0.0843 | 7.90*** |
| FN | 0.0164 | 0.61 |
| NF | 0.0814 | 3.42*** |
| INITIAL404B | 0.8391 | 51.21*** |
| NEWAUD | -0.0163 | -1.18 |
| CRISIS | -0.1429 | -27.32*** |
| Constant | 0.0963 | 9.54*** |
| N | | 49,603 |
| $R^2$ | | 0.212 |

FEE = percentage change of audit fees;

BIGN = indicator variable coded 1 for a Big 5 firm and 0 otherwise;

PCAOB = indicator variable coded 1 if fiscal year end is after 2002 and a company is audited by a Big 4 firm or if fiscal year is after 2003 and a company is audited by a non-Big 4 firm;

CLIENTIMPORT = assets of each client divided by the total assets audited by each firm;

SIZE = percentage change of total assets;

INVREC= percentage change of inventory plus accounts receivable divided by total assets;

ROA = percentage change of net income before extraordinary items and discontinued operations divided by average total assets;

LEV = percentage change of total liabilities divided by total assets;

LP = indicator variable coded 1 for companies which had a loss in the prior year but did not have a loss in the current year;

PL = indicator variable coded 1 for companies which had loss in the current year but did not have a loss in the prior year;

FN = indicator variable coded 1 for companies which paid foreign tax in the prior year but did not pay it in the current year;

NF = indicator variable coded 1 for companies which did not pay foreign tax in the prior year but paid foreign tax in the current year;

INITIAL404B = indicator variable coded 1 if the company had an internal control assessment done by external auditors for the first time;

NEWAUD = indicator variable coded 1 if represents the first year of the auditor-client relationship and 0 otherwise;

CRISIS = 1 if the years are 2007-2009 and 0 otherwise.

*, **, ***- Indicates significance at the 10%, 5%, and 1% level in a two-tailed test respectively.

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# REGULATORY DEBATE ON AUDIT MARKET COMPETITION, AUDIT QUALITY AND AUDIT FEES: AN INTERNATIONAL EXAMINATION

## Introduction

This study is focused on three main areas: 1) the relationship between audit fees and audit market concentration on a country level; 2) the effect of a country's litigation regime on the relationship between audit fees and market concentration and 3) the inter-relations between competition, fees, and quality in the market for audit services. The study is motivated by the current debate in the United States and the European Union about the possible problems associated with the current oligopolistic structure of the audit market. The audit market can be characterized as an oligopoly dominated by the four largest accounting firms – the Big 4. Based on global revenues, the smallest of the Big 4 firms is approximately four times bigger than the fifth largest audit firm. Absent regulatory intervention, the possibility of another accounting firm challenging the status quo (and changing the market to the Big 5) is highly unlikely. Thus, to the extent that an oligopoly structure can lead to higher fees and/or lower quality, having such a market structure is of regulatory concern.

Suppliers in an oligopoly, under the right conditions, can become price setters as opposed to price takers. Specifically, given the limited number of competitors, the oligopolistic structure can lead to collusion (most likely implicit, since explicit collusion is prohibited by law) among major suppliers who can tacitly agree to set higher fees and earn abnormal profits at the expense of the buyers. Reducing competition by collusion also has the potential to reduce the motivation to perform high quality services. Thus such market structure has potentially important implications for the fees that these providers charge and the quality of service they offer.

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On the other hand, audit firms in more concentrated markets may be able to take advantage of the economies of scale. Some costs that the firms incur are fixed, e.g. technology, administrative, and training, and if a firm is able to generate more output, fixed costs per unit of output would be lower. Such savings could be passed down to the clients in the form of charging lower fees. From this standpoint, concentrated markets would be associated with lower fees.

Governmental institutions around the world have ordered analyses of the audit market, and resulting reports have voiced concerns over the highly concentrated nature of the audit market and insufficient choice of an auditor. Such reports have been based on the analysis of either one country only (the US, the UK) or a regional group of countries (European Union); however no report has analyzed the audit market globally. Thus, these studies provide a limited view. Major audit clients are multinational entities and audit firm networks are increasingly global in scope: each of the Big 4 firms has offices in over 140 countries. Therefore the international aspect of the audit firm competition cannot be ignored. The importance of this study lies in the fact that it provides a multi-national empirical investigation of the audit competition-fee relationship, an examination of how country-level fee affects the competition-quality relationship, while controlling for country-level factors.

Results show a negative relationship between country-level market concentration and audit fees but only in highly litigious countries, suggesting that the firms are able to obtain economies of scale in more concentrated markets and are willing to pass savings down to their clients. However this relationship only holds for the clients of the Big N firms. Analysis of audit quality suggests that audit quality is higher in more concentrated markets but mediation analysis did not show that the fees mediate the relationship between audit quality and market concentration.

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This study contributes to research and regulation.  This is the first study which analyzes how the relationship between audit market competition and audit fees is impacted by the litigation regime.  This is also the first study to examine how the relationship between audit fees and audit quality is affected by competition internationally.  Furthermore, prior research has not addressed the interrelationships between the audit fees, competition, and quality.  Results from this study can also inform regulatory bodies:  The US Treasury Department, the House of Lords, and the International Federation of Accountants have expressed concerns about the effects the current audit market structure has on the audit prices and quality of services provided (US Treasury, 2008; House of Lords, 2010.a; European Commission, 2010).

## Background

### *Structure of the Audit Market*

"The large public company audit market is a tight oligopoly" dominated by the Big 4 audit firms (GAO, 2003, p.22).  This was also the case when the market was dominated by the Big 5, the Big 6, or the Big 8.  In the United States, and most of the countries in the European Union, the Big 4 audit approximately 90% of the public companies. Such high levels of concentration are a clear sign of an oligopoly.  The Big 4 dominance is even more evident in the large company market: in the US, 98% of the largest 1,500 companies are audited by the Big 4 (US Treasury, 2008).  While the dominance in the smaller company market is not as strong, there is a big gap between the Big 4 and next tier of accounting firms: BDO, McGladrey and Grant Thornton[11].  Each of the Big 4 firms posted global revenues of over $20 billion in 2011, the next

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[11] Based on the evidence from the US, the Big 4 dominance in the small firm market has been decreasing in the 2000's.  The Big 4 audited 22% of the clients with who had under $100 million

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largest firm, BDO, had less than $6 billion worldwide (based on the disclosures on the websites of the firms).  As such, currently, no other accounting firm can truly challenge any of the Big 4.

There are several reasons for such Big 4 dominance. In general, they relate to economies of scale.  Audits of the largest companies require large staff with a global presence and a widely diverse skillset.  Frequently over a hundred auditors are involved in an audit of a single large client.  Smaller accounting firms are unlikely to have the breadth or depth of skilled staff, or the internal and global infrastructure to conduct such an engagement.  The internationalization of business and the resulting internationalization of the audit market require significant resources to be a prominent player, which again is another reason only a few very large firms can afford such an investment.

*Potential Problems Related to the Current Structure of the Audit Market*

Oligopoly is an imperfectly competitive market. As such, audit firms can have long term abnormal profits, which are achieved by potentially charging higher fees than could be sustained in a competitive market.  This problem is exacerbated by the possibility of collusion.  Collusion can be explicit or tacit.  Explicit collusion, which is blatantly in violation of anti-trust laws, refers to major suppliers in the industry explicitly agreeing to reduce competition.  To be clear, there is no evidence that the Big 4 engage in explicit collusion.  However, tacit collusion refers to a situation where "several firms in an industry coordinate their production and pricing decisions by observance of each other's competitive actions and responses" (Hoskisson et al., 2008, p. 195).  Tacit collusion is more likely in the auditing industry, since it does not involve specific agreements among the major players.

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in revenues in 2006, which is a significant decline from 2002, when the Big 4 audited 44%.  The percentage of the clients with revenues between $100 million and $500 million audited by the Big 4 has declined from 90% in 2002 to 71% in 2006 (US Treasury, 2008).

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In a pure oligopoly, even in the absence of collusion, the small number of competitors can result in abnormal profits. As discussed above, barriers to entry are very high, and the emergence of another large firm which would lead to a new Big 5 is highly unlikely. This creates a serious concern for consumers of audit services, especially the largest ones, who realistically have a choice of only four firms. In the absence of healthy price competition, the price can be set high, and the client company, having fewer alternatives, would have to accept it.

The oligopolistic structure of the audit market can also lead to problems related to the quality of work. Since the market is highly concentrated, clients have few options if they chose to switch audit firms (which is especially true for the large clients). Given that audits are differentiated professional services, firms are capable of competing not only on the basis of price but also on the basis of quality. But if concentration is high and competition is low, the firms might not have incentives to engage in quality-based competition by offering higher quality services.

*Potential Advantages of the Current Market Structure.*

Audit firms that have strong positions in the market of a country could face cost advantages from economies of scale, which could be passed down to the customer in the form of a reduced fee. For example, Walmart has cost advantages by controlling a large share of the market, and such cost advantages are passed on to the customer who can buy products at lower prices. Similar strategies can be used in the market for audit services: once a firm gains a significant market share in a country, the firm can experience economies of scale, which then allows the firm to reduce audit fees but keep the same profit margins. An example of a situation where economies of scale could prove advantageous is country-specific reporting requirements. Countries have unique reporting requirements which have to be reflected in the firm's

technology – the databases have to be updated in order to ensure that all country-specific requirements are met.  Such investments in technology are country specific and are fixed costs which do not change based on the level of output. As such, gaining market share would allow the firms to distribute the technology costs over more units of output.  Economies of scale can also be obtained from administrative staff.  The number of administrative staff is not directly proportional to the number of professionals or the size of operations; as such, an increase in output would lead to economies of scale related to administrative staff costs.  Firms conduct national level training sessions on a yearly basis, and if such fixed costs are allocated across more clients, again economies of scale can be obtained.  Finally, one of the major issues a firm can face is under-utilization of its staff: the firms use almost all of their staff during the busy season, but slower times of the year can be associated with unassigned time, which essentially means a lot of unproductive costs for the firm.  With a bigger market share in a country, a firm could have more clients which can be audited in times other than the busy season, so the firm can distribute the work more evenly throughout the year; consequently even in the non-busy season, unassigned hours would be kept to a minimum.

*Audit Market Structure and Regulatory Environment*

A number of studies, as summarized in Wingate (1997), suggests that accounting environments are different across counties as evidenced by differences in, for example, professional status requirements related to licensure, accounting standards (IFRS versus local standards), and disclosure requirements.  One other key difference is litigation regime. Litigation regime refers to "risk of doing business as an auditor" (Wingate, 1997). In some countries auditors can face significant litigation payouts in case of an audit failure, e.g. the US. In other countries, like Germany, there is a cap on how much a firm can pay as a result of a law

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suit (Weber et al., 2008). Such differences can affect the amount and quality of audit procedures performed; firms are more likely to do more work, hence charge more and hypothetically do higher quality audits, in countries where a greater chance of a law suit and the potential payout is high (Choi, 2008). Due to these differences the results obtained from analyzing the data from one country might not be generalizable globally.

<p style="text-align:center"><em>Audit Market Structure and Regulatory Bodies</em></p>

In 2010 the House of Lords Economic Affairs Committee released a call for evidence to "explore concerns that market domination by a small number of firms damages competition and reduces choice in the audit market" (House of Lords, 2010.a). One of the questions specifically asked was whether lack of competition is related to increases in fees. The resulting report provided several important insights on the competition of the audit market. The comments included in the report provided mixed evidence on the possible competitive nature of the audit market. For example, the Chairman of PwC stated that the market was "fiercely competitive", while the Chairman of the Financial Reporting Council and institutional investors disagreed noting current high levels of concentration and that changes were needed (House of Lords, 2010.a).

The results presented in the report showed that there was no lack of competition in the UK audit market. Furthermore, the results showed that the recent fee increases have not been related to the competition among audit firms, but instead to the nature of the work performed, i.e. SOX in the early 2000s and IFRS currently (House of Lords, 2010.b). However, The Financial Reporting Council in the UK released the report by the Market Participants Group titled "Choice in the UK Audit Market". In the report, market participants expressed concerns over the current

concentration of the audit firms, and one of the main recommendations in the report was to improve the choice within the Big 4 (Market Participant Group, 2007).

The House of Lords was also interested in the quality implications related to possible competition issues in the market, stating in its inquiry that "the narrow field of choice raises concerns about competition and the quality of audited accounts" (House of Lords, 2010.a, p.1). The resulting report included opinions and evidence from various sources, both from academia and practice. While the Association of British Insurers specifically stated that "the concern is the cost of audit could be kept low at the expense of quality and conflict of interest" (House of Lords, 2010.b, p. 295), a majority of the evidence presented showed no negative effect of the current competition structure on audit quality.

The European Union also voiced concerns over the current structure of the audit market, specifically noting that the Big 4 audit over 90% of publicly traded companies in the European Union. The International Federation of Accountants responded to the concerns in the 2010 Green Paper by stating that there is a need for empirical research to understand whether the current structure of the audit market presents a risk (European Commission, 2010).

Finally, audit market structure has also been under scrutiny in the US. The US Department of the Treasury released a report by the Advisory Committee on the Auditing Profession in 2008. The evidence considered by the Committee included testimonies from the PCAOB, GAO, accounting firms and investors. The Committee noted that audit market concentration has not been associated with higher fees or lower quality, however the Committee expressed the need to "reduce barriers to the growth of smaller auditing firms" (US Treasury, 2008, p. VIII:4). The Committee also found no evidence that audit quality is negatively affected by the limited competition in the audit market. The Committee agreed that there should be

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regulatory changes to increase the market share of public client services by small accounting firms, thus making them more competitive with the Big 4. The 2008 GAO report on the concentration in audit markets states that 82 percent of the Fortune 1000 companies were limited to at most three audit firms from which they could chose. Furthermore, the survey conducted by GAO showed that 60% of the Fortune 1000 considered audit competition to be insufficient. On the other hand the results of the study showed that small companies were more satisfied with audit firm concentration and available audit firm choices.

The discussion above shows that competition in the audit market is an important topic discussed in the US and beyond, and concern has been raised about the current highly concentrated structure of the audit market. However, the results presented by various governmental bodies found no evidence that high concentration was associated with increased fees or decreased quality. These conclusions were based on testimonies and very few empirical findings were cited, therefore there is a need for an empirical examination of the relationship between audit firm competition and audit fees. The purpose of this study is to 1) examine the relationship between the competition in the audit market and fees charged by the audit firms internationally; 2) investigate how this relationship is impacted by the country's litigation regime and 3) examine how audit fees mediate the relationship between country level competition among audit firms and audit quality.

Effect of Competition on Audit Fees

*Prior Research*

*Audit Market Structure*

Prior research has examined the structure of the audit market.  Eichenseher and Danos
(1981) analyze auditor concentration on the industry level.  They use a four firm concentration
ratio (the sum of the market shares of the four largest firms) as their proxy for competition and
find that auditor concentration is positively associated with security issuances and regulatory
control.  Danos and Eichenseher (1982) argue that audit firms with large shares of the overall
audit market have cost advantages over other audit firms. Their results also show cost advantages
related to having a large industry share. However their finding varied by the extent to which
specific industries were regulated by the federal government.  Danos and Eichenseher (1986)
investigate long term trends in the audit industry and conclude that the Big 8 firms had
comparative advantage and thus a larger market share in serving large clients, but again this
finding was true for mostly regulated industries.

Following from Danos and Eichenseher (1982), Pearson and Trompeter (1994)
investigated the relationship between the concentration and competition in the insurance industry
audit market.  The authors measure concentration as the market share controlled by the top three
of the six largest audit firms.   The results show a negative relationship between concentration
and fees, suggesting that more concentrated markets have more price competition.

Carson (2009) investigated the role of global audit networks using data from 60
countries.  Her results suggest that there is a premium charged by the global industry leader.
Carson et al. (2011) analyze Big N fee premiums using a sample of Australian companies.  Their

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results show that the Big N fee premium increases with the decrease in the number of Big N audit firms. In particular, the authors find that the size of the Big N premium paid by small clients increases as the number of Big N firms decreases. Their results also show that the premium paid to a Big N industry leader increases with the decrease in the number of the Big N firms. Bandiopandhyay and Kao (2004), using data from Ontario, show a positive relationship between market concentration in the audit market and audit fees for the Big 6, but their results did not hold for non-Big 6 firms.

Countries in which the firms operate vary in their legal and disclosure requirements. As such, while there are firm-wide standards and regulations, audits have to be adjusted based on the country specific requirements. Choi et al. (2008) use a sample from 15 countries to investigate the impact of the country's litigation environment on audit fee premium. The results show a positive relationship between audit fees and strictness of a country's legal regime. The results also show that the Big 4 fee premium is lower in countries where the legal regime is strict; this suggests that higher quality (and higher fees) is demanded by litigation risk. Finally the authors find that the impact of the legal regime on the Big 4 fee premium is stronger for small and medium clients than for large clients. Related to differences in legal regime, Choi and Wong (2007) use a sample from 39 countries to investigate the relationship between a country's legal regime and the governance role of auditors. The results show that auditors play a more significant governance function in the countries where the legal regime is weak than in those countries where the legal system is strong.

In summary, prior research on audit market structure suggest that firms with large market shares have cost advantages (Danos and Eichenseher, 1982, 1986). However there is no consensus on whether or not such savings are passed down to the clients is the form of lower fees

(Pearson and Trompeter, 1994), or, as noted in Canada and Australia, whether high concentration leads to higher fees (Bandyopadhyay and Kao, 2004; Carson et al., 2011).

*Competition and Regulation*

Maher et al. (1992) investigate the changes in audit fees during a time of increased competitiveness. The authors do not use a specific measure of competitiveness in the audit market; instead they compare audit fees in 1977 to 1981. That four-year period was characterized by government criticism of anti-competitive behavior in the audit market and witnessed several regulatory changes intended to increase competition among audit firms. The results show that, after controlling for inflation, the audit fees significantly decreased from 1977 to 1981 supporting the notion that increased competition leads to lower audit fees.

Sanders et al. (1995) use a larger sample of municipal audit fees for the years 1985-1989 since that time period was marked by strong regulatory changes in the audit market which led to a more competitive environment. Similar to Maher et al. (1992) the authors do not use specific measures of competition and focus simply on the change in audit fees from 1985 to 1989. The results show an increase in audit fees that was less than the general rate of inflation. The authors argue that real audit fees declined when the audit market became more competitive.

Crittenden et al. (2003) investigate how the fee premiums were affected by a relaxation of anti-competitive restrictions in the UK. The authors use a similar approach to Maher et al. (1992) and Sanders et al. (1995), i.e. the authors do not specifically measure competition levels but compare the fees before and after changes in competitive regulation. The results show that top tier audit firms charged less premium once competition intensified.

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In summary, prior research has investigated the effect of regulation on competition and fees and showed that if regulatory changes increased competition in the audit market, this also resulted in lower audit fees.

## *Research Question Development*

The market for audit services is oligopolistic: currently there are four large firms that dominate the market. This is partly driven by the nature of the clients, auditing large multinational clients requires significant resources, which creates barriers to entry by preventing small audit firms that do not have sufficient resources to compete for large clients. Further, oligopolistic competition is imperfect, and the providers are price setters as opposed to price takers, which can result in providers charging a fee premium in order to earn abnormal profits (Kaneko, 1978). With respect to the auditing profession, these concerns have been expressed by the U.S. Senate Subcommittee on Reports, Accounting and Management in The Accounting Establishment (1976): "the extremely high concentration of major corporate clients among the "Big Eight" firms … certainly presents a situation calling for investigation into the anti-competitive effects which may reasonably be expected from such high concentration". As discussed in the earlier sections, another negative aspect of an oligopoly is a possibility of tacit collusion (Cox, 2006), which can lead to higher prices than would be observed under perfect competition. Such implicit collusion is achieved more easily when there are only a few parties involved (Cox, 2006). As such, if the market is very concentrated (dominated by a small number of service providers), collusion can be achieved more easily than in a less concentrated market.

On the other hand, if concentration leads to economies of scale, and the firms are willing to pass the saving down to their clients (Danos and Eichenseher, 1982; Pearson and Trompeter, 1994), the fees would actually be lower in the more concentrated markets. Furthermore, the

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relationship between concentration and price can be different based on the size of the firm: the Big 4, due to their size, might be in a better position to benefit from economies of scale than smaller non-Big 4 firms. Since there are two competing theoretical views on the phenomenon, I present the following research questions as opposed to hypotheses.

**RQ1a: Is concentration in the audit market associated with the fees charged by the Big N audit firms?**

**RQ1b: Is concentration in the audit market associated with the fees charged by non-Big N firms?**

As mentioned earlier, accounting environments are different across countries, and pressures that audit firms are facing are impacted by the litigiousness of the country: more litigious environment are expected to be associated with higher audit fees. Litigation environment in a country can also impact the relationship between concentration and fees. The firms in more litigious environments might want to ensure they have enough funds to cover any potential legal settlements. From this standpoint, if the firms are using their oligopolistic power to charge higher fees (assuming there is a positive relationship between fees and concentration), they would charge even more in a more litigious environment, because expected legal costs are higher. If the firms enjoy economies of scale from controlling a large share of the market (assuming there is a negative relationship between fees and concentration), they might be unwilling to pass that down to their clients in order to save funds in case of litigation payouts.

On the other hand, the fees in less litigious countries are expected to be lower. Audit firms, since they are very unlikely to get sued, could be more influenced by client bargaining power, which would put further downward pressure on the fees (in highly litigious environments the firms are less likely give in to client demands, because the risk of a law suit is great). Consequently the firms could have lower profit margins in less litigious countries. So, if a firm

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gains any economies of scale from gaining more market share, the firm might not be willing to pass any saving down to their clients, because the profit margins are low. Since there are two theoretical views on how litigiousness of a country's regime can affect the fees/concentration relationship, I state the second research question:

**RQ2: What is the effect of the litigation environment on the relationship between audit fees and market concentration?**

<u>Competition and Audit Quality – Mediating Effect of Audit Fees</u>

*Prior research*

*Fees and quality*

Prior research shows mixed results related to the relationship between audit fees and audit quality. Several studies, using various proxies for audit quality (accrual measures, Sirindhi and Gul (2007); propensity to issue a going concern opinion, Geiger and Rama (2003) ; accruals and earnings, Frankel et al. (2002)), show a positive relation between fees and quality. On the other hand, Larcker and Richardson (2004) and Gul et al. (2003) use accrual measures to show that the relationship between audit fees and quality is negative[12]. Finally, Craswell et al. (2002) show no relationship between audit fees and audit quality as measured by a propensity to issue a going concern[13].

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[12] A possible reason why the results in these studies are different from Frankel et al. (2002) is discussed in Reynolds et al. (2004) who show that the results in Frankel et al. (2002) were driven by small and medium high growth firms.
[13] This study uses the same measure of audit quality as Geiger and Rama (2003), and differences in results can be due to the fact that Craswell et al. (2002) uses a sample of all available companies and Geiger and Rama (2003) used a sample of small distressed companies only.

Prior research also shows that the relationship between fees and quality might not be symmetric; instead the relationship depends on the sign of accruals. Choi et al. (2010) investigate a relationship between abnormal audit fees and audit quality, and find that companies with positive unexpected audit fees had lower audit quality, however the relationship did not hold for clients with negative unexpected fees. Abbott et al. (2006) shows a positive relationship between audit fees and income increasing discretionary accruals, and a negative relationship between audit fees and income decreasing accruals.

*Quality and competition*

Prior research has examined the relationship between competition and audit quality and the results are mixed. Francis et al. (2012) investigate the relationship between audit quality and concentration internationally and find a positive relationship between audit quality and the Big 4 market dominance, but find a negative relationship between audit quality and market competition within the Big 4. Kallapur et al (2010) also find a positive relationship between audit quality and competition at the metropolitan statistical area level in the US. On the other hand Numan and Willekens (2011) show that audit quality, as measured by accruals and propensity to issue a going concern opinion, is negatively associated with competition at the office level.

In summary, prior research has examined the relationship between fees and quality as well competition and quality providing mixed results. However prior research has not investigated the inter-relationship among fees, concentration, and quality, specifically, whether fees could change the relationship between quality and concentration, which is the focus of the following section. Understanding the inter-relationship among these three constructs could potentially provide additional insights which would explain why the results of prior research have been mixed.

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*Hypothesis development*

While prior research on audit fees, audit quality, and competition has investigated relationships between combinations of two of the three variables (fees, quality and concentration), this is the first study to consider all three of these aspects together.  I argue that the relationship between competition and audit quality is mediated by audit fees.  Mediation is tested using the method introduced by Baron and Kenny (1986), according to which mediation occurs when the following conditions are met:

A) There is a significant relationship between the independent and the dependent variables.

B) There is a significant relationship between the independent and the mediating variables.

C) After controlling for the mediating variable the relationship between the dependent and the mediating variable is significant, but the relationship between the independent and the dependent variables is not significant (full mediation) or less significant (partial mediation) than in (A).

The first condition in the mediation test will be addressed by testing the relationship between concentration (independent variable) and audit quality (dependent variable).  Since the results of prior research were mixed, I do not provide a directional hypothesis on this relationship.

The second condition in the mediation test will be addressed by testing the relationship between concentration (independent variable) and audit fees (mediating variable).  As discussed previously, there are competing theoretical views on this relationship. As such, I do not provide a directional hypothesis on the relationship between concentration and audit fees.

The third condition is the mediation test.  It will be addressed by testing the relationship between audit quality and concentration while controlling for fees.  Prior research on the

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relationship between audit fees and audit quality showed mixed results.  However my arguments rely on the reasoning that audit fees are proxies for audit effort, and a high level of effort leads to high quality (Caramanis and Lennox, 2009); as such, the relationship between audit fees and audit quality (before concentration is controlled for) is expected to be positive.  As noted above, higher competition puts a downward pressure on audit fees.  However, in spite of this, firms are expected to be still interested in maintaining their profit margins.  Thus, when faced with competitive pressures to reduce fees, firms would be pressed to reduce their costs.  Cost reduction can be achieved by reducing the effort, which is expected to lead to lower audit quality.  In summary, I will test the proposition that competition does not affect audit quality directly, but does so through audit fees.  Increased competition puts downward pressure on audit fees, which causes the firms to reduce their effort, which in its turn, leads to lower audit quality. Therefore, I expect audit fees to mediate the relationship between audit quality and concentration.  This leads to the following hypothesis:

**H1: Audit fees mediate the relationship between audit quality and concentration at a country level.**

<u>Research Methods</u>

*Concentration Measures*

I use concentration as a measure of competition, and all concentration measures are calculated at the country level.  A two-firm concentration ratio calculated as the market portion controlled by the two largest audit firms for each country year divided by the total audit market in each country each year. This measure is used to test all research questions as well as H1.

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Ideally, the concentration ratio is calculated using audit fees. However the data on audit fees is limited, thus I use square roots of clients' assets in order to calculate the concentration ratios. Using square roots of clients' assets instead of total client's assets provides a better approximation for the market share because square roots of assets are better estimates of audit fees than total assets, consistent with prior research (Cahan et al.,2008; Danos and Eichenseher, 1982; and Simunic,1980).

The following formula is used to calculate the concentration ratio:

$$CR2 = (\sum \sqrt{A_i})/ (\sum \sqrt{A_{total}}), \tag{4}$$

where CR2 is the two-firm concentration ratio; $A_i$ refers to the client assets audited by the two largest audit firms in a country, $A_{total}$ refers to the total assets in the country.

RQ1a, examining the relationship between fees and concentration for the Big 4 firms, is tested using two concentration measures[14]. The first measure is the two-firm concentration ratio calculated as described above. The second is the Herfindahl index, which is a common measure of competition (Bandiopandhyay and Kao, 2004; Francis et al., 2011; Kallapur, 2008). Furthermore, while the CR2 measures the market share controlled by the two largest firms, the Herfindahl index measures the competition *within* the Big 4 group (Francis et al., 2011). The Herfindahl index is calculated as the sum of the squares of the market shares of each audit firm:

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[14] A number of observations in the data have "other" as the auditor. As such HI could not be calculated, since I cannot make an assumption that "other" refers to the same audit firm. Therefore the market shares of each individual firm (and subsequently HI) which was coded "other" cannot be accurately calculated. Since RQ1a requires the sample of only the Big N, all observations coded "other" are excluded from such sample, consequently HI can be accurately calculated.

$$HI = \sum_{i}^{N} (s_i / S)^2,$$ (5)

where HI is the Herfindahl index, N refers to the number of audit firms in the country; $s_i$ is the size of the audit firm's client base, S is the size of the complete audit market in the country. Consistent with the CR2 measure, size of the audit firm is measured by the sum of the square roots of the firm's clients' assets, and the country markets are measured by the sum of the square roots of total assets in each country.

*Testing RQ1*

The following model is used to examine the research questions:

FEE = $\beta_0$ + $\beta_1$CONCEN + $\beta_2$LITIG + $\beta_3$CONCEN*LITIG + $\beta_4$SIZE + $\beta_5$CATA + $\beta_6$LOSS + $\beta_7$OPAT_TA + $\beta_8$LEV + $\beta_9$GDP + $\beta_{10}$SOX + fixed effects + $\varepsilon$ (6)

Where

FEE = the natural log of total audit fees paid by the company;

CONCEN = the concentration ratio measured using CR2 and HI for tests of RQ1a, and CR2 for testing RQ1b and H1;

LITIG = litigation index from Wingate (1997);

SIZE = the natural log of total assets;

CATA = the ratio of current assets to total assets;

LOSS = the indicator variable coded 1 if the company had a loss and 0 otherwise;

OPAT_TA = the ratio of net profit to total assets;

LEV = the ratio of total liabilities to total assets;

GDP = gross domestic product per capita, in thousands, as provided by the World Bank;

SOX = indicator variable coded 1 if fiscal year end is after 2001;

Fixed effects = fiscal year, country, industry indicator variables.

CONCEN, and CONCEN*LITIG are the main independent variables of interest. Since I provide competing theoretical views on the relationship between concentration and fees and how this relationship is affected by the litigation environment, I do not predict a sign on $\beta_1$ and $\beta_3$. Litigation environment is expected to be associated with higher fees (Choi et al., 2008), as such the expected coefficient on LITIG is positive.

Prior research has shown size to be the main determinant of audit fees with large clients paying more (Simunic, 1980); as such the expected sign on SIZE is positive. CATA is also expected to also be positively related to audit fees, consequently the expected coefficient on CATA is positive (Carson, 2009). A company that posts a loss is likely to face additional pressures and risks related to poor financial performance, which would require additional audit procedures to be performed; thus the expected coefficient on LOSS is positive (Carson, 2009). Profitable companies are presumably, on average, less risky, and have been shown to pay lower fees, thus the expected coefficient on OPAT_TA is negative (Carson, 2009). Increased leverage increases the audit risk of a company, which has been shown to result in companies paying higher fees; consequently the expected coefficient on LEV is positive (Choi et al., 2010).

Wingate (1997) lists a number of country-wide indices based on the countries' audit environments. Level of litigiousness is the index that is the most relevant to the audit fees. Liability standard refers to the "risk of doing business as an auditor". Higher risk of liability and public enforcement on the part of the audit firm will put upward pressure on the number and complexity of procedures the firm would be performing, which would lead to higher audit fees. Given this, the expected coefficient on LITIG (Wingate, 1997) is positive. Using this variable is consistent with Choi et al. (2008).

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GDP per capita in thousands is a measure of the cost of living in a country; as such I expect a positive association between GDP and FEE (Choi et al., 2008). Sarbanes Oxley increased scrutiny over audit quality around the world and created new audit requirements (e.g. section 404), which is expected to be associated with high audit fees; consequently I expect a positive coefficient on SOX.

*Hypothesis 1*

Audit quality is proxied by absolute discretionary accruals which are estimated using the modified Jones (1991) model. Discretionary accruals are calculated by saving residuals from Equation 7. The equation is estimated by year/country/industry.

$$ACCR_t/TA_{t-1} = \beta_1 1/TA_{t-1} + \beta_2(REVREC_t)/TA_{t-1} + \beta_3 PPE_t/TA_{t-1} + \varepsilon \qquad (7)$$

ACCR refers to total accruals, which include non-discretionary as well as discretionary accruals. Total accruals are calculated by subtracting operating cash flows from net income before extraordinary items and discontinued operations. $TA_{t-1}$ is total assets in the prior period. REVREC is calculated as the difference between change in sales and change in receivables from the prior year. Finally, PPE refers to gross property, plant, and equipment.

The following models are used to test mediation:

Condition 1 (the relationship between audit quality and concentration) is tested using Equation 8:
$$DA = \beta_0 + \beta_1 CONCEN + \beta_2 LITIG + \beta_3 BIGN + \beta_4 SIZE + \beta_5 OPAT\_TA + \beta_6 GROWTH + \beta_7 LEV + \beta_8 LOSS + \beta_9 GDP + \beta_{10} SOX + \text{fixed effects} + \varepsilon \qquad (8)$$

Condition 2 (the relationship between audit fees and concentration) is tested using Equation 9:
$$FEE = \beta_0 + \beta_1 CONCEN + \beta_2 LITIG + \beta_3 BIGN + \beta_4 SIZE + \beta_5 OPAT\_TA + \beta_6 GROWTH + \beta_7 LEV + \beta_8 LOSS + \beta_9 GDP + \beta_{10} SOX + \text{fixed effects} + \varepsilon \qquad (9)$$

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Condition 3 (the mediation test which examines the relationship between quality and concentration controlling for fees) is tested using Equation 10.

$$DA = \beta_0 + \beta_1 FEE + \beta_2 CONCEN + \beta_2 LITIG + \beta_3 BIGN + \beta_4 SIZE + \beta_5 OPAT\_TA + \beta_6 GROWTH + \beta_7 LEV + \beta_8 LOSS + \beta_9 GDP + \beta_{10} SOX + \text{fixed effects} + \varepsilon \qquad (10)$$

CONCEN, FEE, LITIG, SIZE, OPAT_TA, LEV, LOSS, GDP, and SOX were defined in the previous section.

DA = absolute discretionary accruals calculated using the modified Jones (1991) model included in equation 7;

BIGN = indicator variables coded 1 if the audit firm is a Big N firm;

GROWTH = sales growth from prior year calculated as change in sales from prior year divided by total assets (this allows capturing all companies who might have zero sales in the previous year).

I do not predict the sign of the coefficient on CONCEN in Equation 8, Equation 9, or Equation 10 due to competing theoretical views on the relationship between competition (as proxied by concentration) and audit quality. I expect a positive relationship between audit fees and audit quality (a proxy for audit effort). Therefore the expected coefficient on FEE in Equation 10 is positive. Finally I expect the coefficient on CONCEN in Equation 10 to be not significant, because I expect audit fees to fully mediate the relationship between competition and audit quality.

Consistent with prior research, large companies are expected to have lower discretionary accruals (Francis et al., 2012; Frankel et al., 2002); as such the expected coefficient of SIZE is negative. Prior research has also shown that the clients of the Big 4 have lower discretionary accruals (Becker et al., 1998). Thus, I expect a negative coefficient for the BIG4. LOSS and LEV, are measures of a company's risk: companies with low profitability and high leverage are likely to display higher discretionary accruals; including these variables is consistent with prior research (Lim and Tan, 2008; Frankel et al., 2002; Francis et al., 2012); fast growing companies are also expected to have higher discretionary accruals due to changes in operations as a result of

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expansion (Ashbaugh-Skaife et al., 2008); therefore I expect positive coefficients on LEV and LOSS, and GROWTH.

I expect audit quality to be higher in countries with higher legal liability standards, because in such countries auditors have high chances of litigation and high potential payouts. Given this I expect a negative coefficient on the LITIG variable, which is consistent with Francis et al. (2012). Countries with higher GDP per capita are expected to have a developed financial system with higher quality financial reporting, as such I expect a negative coefficient on GDP.

<u>Results</u>

*Research Questions*

The sample was obtained from the Extel/Company Analysis database and Global Compustat for the years 1998-2009. The Extel database includes audit fees and financial data for all observations used in testing. Data from Compustat was used to increase the number of observations used to calculate concentration ratios to make those measures more representative of the population. I exclude all observations from India, Pakistan, South Korea, and Japan because international audit firms operate in those countries through local affiliates which are not coded in the database. I also exclude all observations from France, because French companies are required to have two auditors, and most observations in the database only had one auditor coded. All firm years which were unaudited are also excluded. All observations that were missing data necessary to calculate financial variables are also excluded. The sample used for testing RQ1a also excludes all non-Big N clients, similarly the sample used for testing RQ1b

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excludes all the Big 4. RQ2 is tested separately for the Big4 and non-Big 4 firms. I also exclude all countries with less than 100 observations and all country-years where the concentration ratio was calculated based on less than 50 observations. All continuous variables in the model are winsorized at the $1^{st}$ and $99^{th}$ percentiles.

RQ1 is focused on the relationship between fees and market concentration for the Big N firms and is tested using the sample which consisted of 16,078 firm years from 14 countries. Summary by country is included in Table 6. All items in the table are averages for the sample period. The mean Wingate litigation index is 7.57, USA, UK, Canada, Hong Kong, Australia and New Zealand are above the mean, indicating they are more litigious countries, with the US being the most litigious with a litigation index of 15. The most concentrated audit market is in Ireland (CR2=0.83, HHI=0.45), and the least concentrated market is in Malaysia (CR2=0.47, HHI=0.16). Audit fees are the highest in the US (average $19 million) and the lowest in Malaysia ($77 thousand).

Descriptive statistics are included in Table 7 and the correlation matrix is included in Table 8. Audit fees as positively associated with both market concentration measures, the litigation environment of a country, interactions between market concentration and litigation environment, having a Big N auditor, size of the client, ratio of current assets to total assets, leverage, and GDP per capita in the country. Fees are also higher after Sarbanes Oxley. Surprisingly, there is a negative correlation between having a loss and fees; there is also a positive correlation between profitability and fees.

Correlations between HI and CR2, FEE and SIZE, CR2*LITIG and HI*LITIG, LITIG and CR2* LITIG, LITIG and HI*LITIG are above 0.7. SIZE is highly negatively correlated with

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LOSS (-0.42) and positively correlated with OPAT_TA (0.4). GDP is highly correlated with LITIG, CR2*LITIG, HI*LITIG, and SOX (0.57, 0.44, 0.47 and 0.51 respectively). Other correlations above 0.25 are LITIG and CR2 (-0.32), OPAT_TA and LOSS (-0.53). Correlation between CR2*LITIG and LITIG is very high (0.76) and correlation between HI*LITIG and LITIG is very high as well (0.77), suggesting multicollinearity problems in the model. In order to address these collinearity issues I first re-estimate Model 3 without the interaction variables to determine the relationship between audit fees and market concentration. Then, in order to investigate how the fee-concentration relationship is affected by the litigation regime, I divide the sample into high and low litigation countries and I re-estimate Model 3 separately for each sub-sample[15]. Finally, I compare the coefficients on the concentration measures[16].

Table 9 includes multivariate results of the model to test RQ1. If CR2 is used as a measure of concentration, the results show that the fees are lower in highly concentrated markets (t=-2.02), suggesting economies of scale. However if HI is used as a measure of concentration, then the result no longer holds (t=-0.99). All other variables are significant in predicted directions. The model is estimated with robust standard errors and clustering by firm.

In order to investigate how the relationship between fees and concentration is affected by the litigation environment of the country, I separate the observations into low and high litigation environments (countries with litigation index above the mean litigation index of 7.57 are

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[15] Since the sub-samples are created based on a country's litigation environment, LITIG is going to be the same for all observations in each sub-sample. Therefore Model 3 used to test for these subsample does not include the CONCEN*LITIG.

[16] I estimated the full model, including the interactions variables, using mean centered and standardized values of CONCEN, LITIG and the interaction between these variables in order to reduce collinearity problems. The VIF's still indicated high multicollinearity, therefore I re-estimated the model separately for high and low litigation countries and compared coefficients to test the impact of the litigation environments on the concentration-fee relationship in order to avoid collinearity issues.

considered highly litigious), re-estimate Model 6 and then compare coefficients on market concentration across the two regressions. Table 10 summarizes the results for both measures of market concentration: results using a two-firm concentration ratio are included in Panel A and results using Herfindahl index are included in Panel B. The results suggest that the relationship between audit fees and concentration is affected by the regulatory regime. In highly litigious countries high market concentration is associated with low audit fees (t=-4.9 using CR2 and t=-4.71 using HI), which suggests that the firms obtain economies of scale in concentrated markets, and those economies of scale are passed down to their clients. What is surprising is the fact that in less litigious countries, concentrated audit markets are actually associated with higher audit fees: the association is significant using the CR2 measure (t=2.08) and is marginally significant using the HI measure (t=1.84).

The coefficients of both CR2 and HI are negative and are significantly lower in countries with high litigation than in countries with low litigation (Chi-squared of 21.58 using CR2 and 22.72 using HI, which are both significant at p<0.001), which suggests that audit firms are more likely to pass savings obtained from economies of scale to their clients in highly litigious countries than in less litigious countries. One possible explanation of such phenomenon is as follows: audit fees are lower in less litigious countries, furthermore since the likelihood of a law suit is relatively remote (e.g. in Norway there were 40 litigation cases against audit firms from 1945 to 2005, as discussed in Hope and Langli, 2010), the firms could be more influenced by client's bargaining power, which would could potentially lead the firms to have lower profit margins than what they would be able to obtain in a more litigious environment. If the profit margins are low, even if the firms do obtain economies of scale from gaining market share, they would not be willing to pass those down to their clients. Since I do not have the data on

profitability of the firms, I cannot test this notion; as such future research can focus on providing an explanation of this phenomenon.

For additional testing I re-estimate the model only for the post-Sox subsample, the results (untabulated) were qualitatively the same. A large number of observations in the sample are from Australia (6,222) and the United Kingdom (4,905). In order to make sure that the results are not driven by one country, the model is re-estimated excluding each of these countries, one at a time. The results (untabulated) are qualitatively the same.

In order to answer RQ1b (the relationship between fees and concentration for non-Big 4 firms), I first estimate Model 6 without the interaction variables (in order to avoid multicollinearity problems) for all non-Big 4 observations; the results are included in Table 11. The results presented in Panel A do not show a significant association between concentration and fees, but surprisingly, the relationship between fees and litigiousness of the country's environment was negative. However this result seems to be driven by Australian observations: once observations from Australia are excluded, the coefficient on LITIG becomes significantly positive and the coefficient on CR2 becomes significantly negative (Panel B).

In order to investigate how the relationship between concentration and fees for non-Big 4 firms is impacted by the litigiousness of a country, I re-estimate Model 6 separately for highly litigious and less litigious countries and compare coefficients on CR2 (Model 6 is estimated without LITIG and CONCEN*LITIG, because LITIG is the same for all observation in a sub-sample). The results are included in Table 12. The analysis showed no significant differences between the relationship between audit fees and market concentration in highly litigious and less litigious countries. The results are similar when all Australian observations are excluded.

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In summary, the results obtained using the Big N sample do not hold when non-Big N observations are used. This could be partly due to the fact that economies of scale observed in highly litigious environments in Big N firms are not obtainable by smaller firms simply due to their size, or non-Big N firms have fewer resources and are less likely to be sued. On the other hand the results for non-Big N firms could be affected by the sample size limitation: the analysis is based on observations from only six countries (as opposed to the Big N analysis based on 14 countries).

*Hypothesis 1*

Hypothesis one predicts a mediating effect of audit fees on the relationship between audit quality and audit market concentration. In order for mediation to occur there should be a significant relationship between audit quality and concentration, there also should be a significant relationship between audit fees and concentration; finally once audit fees are included in the model the relationship between audit quality and concentration should disappear (full mediation) or weaken (partial mediation). Partial mediation is determined using the Sobel test, which is consistent with Reffett (2010), Denison (2009). Mediation is tested using a sample of 7,598 observations from six countries. This sample is much smaller than the sample which was used to test the relationship between audit fees and market concentration in the previous section. This is primarily due to the fact that discretionary accrual models do not include observations from financial firms and utilities. Also, in order to estimate discretionary accruals, each industry year requires a minimum of ten observations. The results are summarized in Table 13. All continuous variables in the model are winsorized at the $1^{st}$ and $99^{th}$ percentiles. There is a significantly negative relationship between discretionary accruals and concentration (t=-10.37, see Panel A), suggesting that audit quality is higher is more concentrated markets (which is

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consistent with Francis et al., 2011).  There is a significantly negative relationship between audit fees and concentration (t=-2.30, see Panel B), which suggests that in concentrated markets the firms take advantage of economies of scale and pass savings down to their clients.  However once discretionary accruals are regressed on audit fees and market concentration, the coefficients on both independent variables remain significantly negative (see Panel C).  Sobel mediation test (which relies on the Baron and Kenney (1986) procedure described above) is marginally significant (p=0.074) however adding the fees to the quality/concentration model does not reduce the effect of concentration on quality but instead increases it by a very small margin (0.7%).  As such the expected mediation effect of fees was not observed.

## Conclusion

This study was focused on three main areas: the relationship between country level audit market concentration, how this relationship is affected by the country's litigation regime, and whether audit fees mediate the relationship between market concentration and audit quality.

The audit market is oligopolistic. As such as the market becomes more concentrated, firms can use their oligopoly powers to charge higher fees. This would suggest that high market concentration has a negative effect on clients.  On the other hand, when the market is more concentrated, the firms can take advantages of economies of scale and pass some of the savings to their clients by charging lower fees in more concentrated markets.  The current market structure has been the subject of investigations by the US Treasury Department, the UK House of Lords, and the International Federation of Accountants, suggesting that the topic is very relevant to the regulatory bodies.  While prior research has examined the relationship between

geographical market concentration and audit fees, the results were based on observations from one country.  Audit environments differ from country to country, as such results based on observations from one country only might not be generalizable to other countries.

In this paper I show that the relationship between market concentration and audit fees is different depending on the litigation environment of the country.  Auditors in highly litigious countries seem to obtain economies of scale and are willing to pass the savings down to their clients by reducing their fees, which is suggested by a negative relationship between market concentration and audit fees in such countries.  However this behavior is not observed in less litigious countries.  This could be due to the fact that since the fees in less litigious countries are lower, the profit margins that the firms have are also lower than what they would be in more litigious countries.  Consequently, the firms are not willing to pass down any saving obtained from economies of scale to their clients.  Since I do not have the data on audit firm profitability around the world to investigate whether this proposition is correct, it can be tested in future research.  From a regulatory perspective, the results in this emphasize the importance of a strong litigation regime in a country.  If a country is highly litigious, the clients actually benefit from high concentration in the audit market.  Finally, I do not find that the relationship between audit fees and audit quality is mediated by audit fees, but I do observe a positive relationship between market concentration and audit quality, which is consistent with Francis et al (2011).

**Table 6 – Descriptive Statistics by Country – Big N Firms**

|  | n | CR2 | HI | Litigation | Average Fee |
|---|---|---|---|---|---|
| Australia | 6,222 | 0.53342 | 0.198926 | 10 | $10,800,000 |
| Canada | 301 | 0.636252 | 0.269919 | 8.07 | $15,000,000 |
| Germany | 117 | 0.579879 | 0.232057 | 6.22 | $2,339,529 |
| Hong Kong | 417 | 0.677201 | 0.273688 | 10 | $255,113 |
| Ireland | 157 | 0.839996 | 0.445672 | 6.22 | $3,634,164 |
| Malaysia | 843 | 0.474665 | 0.155218 | 3.61 | $77,316 |
| New Zealand | 342 | 0.701504 | 0.302435 | 10 | $166,773 |
| Norway | 105 | 0.678862 | 0.308103 | 6.22 | $6,945,420 |
| Singapore | 566 | 0.653619 | 0.261276 | 4.82 | $177,088 |
| South Africa | 567 | 0.674844 | 0.279986 | 4.82 | $998,108 |
| Sweden | 154 | 0.620075 | 0.272783 | 4.82 | $452,237 |
| Switzerland | 163 | 0.781803 | 0.373068 | 6.22 | $1,669,996 |
| United States | 1,219 | 0.490818 | 0.210276 | 15 | $19,000,000 |
| United Kingdom | 4,905 | 0.546638 | 0.207875 | 10 | $1,076,757 |
| Total | 16,078 |  |  |  |  |

CR2 is two firm concentration ratio

HHI is Herfindahl Index

Litigation is Litigation score from Wingate (1997)

**Table 7 - Descriptive Statistics – Big N Firms**

|            | N     | Mean    | SD      | 25%     | Median  | 75%     |
|------------|-------|---------|---------|---------|---------|---------|
| FEE        | 16078 | 11.6851 | 1.69247 | 10.4226 | 11.5071 | 12.7301 |
| CR2        | 16078 | 0.55722 | 0.0811  | 0.50916 | 0.55949 | 0.57381 |
| HI         | 16078 | 0.21658 | 0.05275 | 0.19201 | 0.2137  | 0.22906 |
| LITIG      | 16078 | 9.46585 | 2.53982 | 10      | 10      | 10      |
| CR2* LITIG | 16078 | 0.4548  | 0.20972 | 0.46878 | 0.53227 | 0.56776 |
| HI* LITIG  | 16078 | 0.17493 | 0.08341 | 0.17868 | 0.20103 | 0.21899 |
| SIZE       | 16078 | 18.6891 | 2.23638 | 17.1463 | 18.6752 | 20.1432 |
| CATA       | 16078 | 0.41411 | 0.28579 | 0.15502 | 0.39156 | 0.63191 |
| LOSS       | 16078 | 0.35185 | 0.47756 | 0       | 0       | 1       |
| OPAT_TA    | 16078 | -0.0702 | 0.36135 | -0.0475 | 0.0217  | 0.06655 |
| LEV        | 16078 | 0.47106 | 0.34695 | 0.21933 | 0.4488  | 0.64942 |
| GDP        | 16078 | 29.3701 | 11.6432 | 21.768  | 27.1729 | 38.1957 |
| SOX        | 16078 | 0.67291 | 0.46917 | 0       | 1       | 1       |

FEE is the natural log of total audit fees paid by the company;

CR2 is two firm concentration ratio;

HI is Herfindahl Index;

LITIG is Liability Index from Wingate (1997)

SIZE is the natural log of total assets;

CATA is the ratio of current assets to total assets;

LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;

OPAT_TA is the ratio of net profit to total assets;

LEV is the ratio of total liabilities to total assets;

GDP is the natural logarithm of GDP per capita in each country;

SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.

**Table 8 - Correlation Matrix – Big N Firms**

|  | FEE | CR2 | HI | LITIG | CR2*LITIG | HI*LITIG | SIZE |
|---|---|---|---|---|---|---|---|
| FEE | 1 |  |  |  |  |  |  |
| CR2 | 0.0786 | 1 |  |  |  |  |  |
| HI | 0.1649 | 0.9081 | 1 |  |  |  |  |
| LITIG | 0.2426 | -0.3167 | -0.1748 | 1 |  |  |  |
| CR2*LITIG | 0.0305 | -0.1527 | -0.1574 | 0.7623 | 1 |  |  |
| HI*LITIG | 0.0757 | -0.105 | -0.075 | 0.7713 | 0.9836 | 1 |  |
| SIZE | 0.7367 | 0.084 | 0.1387 | 0.0926 | -0.0489 | -0.0088 | 1 |
| CATA | 0.0286 | 0.0044 | 0.002 | -0.0267 | -0.0627 | -0.0602 | -0.2809 |
| LOSS | -0.2307 | -0.095 | -0.1007 | 0.039 | 0.0621 | 0.0451 | -0.4163 |
| OPAT_TA | 0.1966 | 0.0815 | 0.0853 | -0.0401 | -0.0581 | -0.0432 | 0.3972 |
| LEV | 0.318 | -0.0163 | 0.0005 | -0.0672 | -0.1283 | -0.1137 | 0.217 |
| GDP | 0.3199 | 0.0171 | 0.1583 | 0.5716 | 0.4431 | 0.4749 | 0.1742 |
| SOX | 0.2288 | 0.2233 | 0.2821 | 0.1955 | 0.1891 | 0.2636 | 0.112 |

|  | CATA | LOSS | OPAT_TA | LEV | GDP | SOX |
|---|---|---|---|---|---|---|
| CATA | 1 |  |  |  |  |  |
| LOSS | 0.0839 | 1 |  |  |  |  |
| OPAT_TA | -0.121 | -0.5299 | 1 |  |  |  |
| LEV | 0.1109 | 0.0112 | -0.1922 | 1 |  |  |
| GDP | -0.0265 | -0.0064 | 0.0161 | -0.0533 | 1 |  |
| SOX | -0.0012 | -0.0099 | 0.0087 | -0.0177 | 0.5081 | 1 |

FEE is the natural log of total audit fees paid by the company;
CR2 is two firm concentration ratio;
HI is Herfindahl Index;
LITIG is Liability Index from Wingate (1997)
SIZE is the natural log of total assets;
CATA is the ratio of current assets to total assets;
LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;
OPAT_TA is the ratio of net profit to total assets;
LEV is the ratio of total liabilities to total assets;
GDP is the natural logarithm of GDP per capita in each country;
SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.

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**Table 9 - Multivariate Results – Big N Firms**

| FEE | Pred. | CR2 | t-value | HI | t-value |
|---|---|---|---|---|---|
| CR2 | +/- | -0.3371 | -2.02** | | |
| HI | +/- | | | -0.2655 | -0.99 |
| LITIG | + | 0.1868 | 14.63*** | 0.1824 | 15.02*** |
| SIZE | + | 0.5541 | 70*** | 0.5539 | 70*** |
| CATA | + | 0.6510 | 13.44*** | 0.6499 | 13.42*** |
| LOSS | + | 0.1246 | 5.66*** | 0.1242 | 5.65*** |
| OPAT_TA | - | -0.1369 | -5.14*** | -0.1370 | -5.14*** |
| LEV | + | 0.5183 | 15.09*** | 0.5184 | 15.1*** |
| GDP | + | 0.0063 | 2.25** | 0.0073 | 2.73*** |
| SOX | + | 0.5016 | 8.44*** | 0.4831 | 8.49*** |
| | | | | | |
| Country fixed effects | | Yes | | Yes | |
| Year Fixed Effects | | Yes | | Yes | |
| Industry Fixed Effects | | Yes | | Yes | |
| | | | | | |
| N | | 16078 | | 16078 | |
| R squared | | 0.76 | | 0.76 | |

FEE is the natural log of total audit fees paid by the company;

CR2 is two firm concentration ratio;

HI is Herfindahl Index;

LITIG is Liability Index from Wingate (1997)

SIZE is the natural log of total assets;

CATA is the ratio of current assets to total assets;

LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;

OPAT_TA is the ratio of net profit to total assets;

LEV is the ratio of total liabilities to total assets;

GDP is the natural logarithm of GDP per capita in each country;

SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

### Table 10 - Effect of the Litigation Regime – Big N firms

Panel A: Using CR2 as a measure of market concentration

| FEE | High Litigation | | Low Litigation | | |
|---|---|---|---|---|---|
| | Coefficient | t-value | Coefficient | t-value | Chi-Squared |
| CR2 | -1.0832 | -4.9*** | 0.5958 | 2.08** | 21.58*** |
| SIZE | 0.5479 | 61.82*** | 0.5836 | 34.16*** | |
| CATA | 0.6420 | 11.79*** | 0.6034 | 5.82*** | |
| LOSS | 0.1146 | 4.65*** | 0.2119 | 4.7*** | |
| OPAT_TA | -0.1341 | -4.68*** | -0.1271 | -1.69* | |
| LEV | 0.5849 | 14.83*** | 0.3063 | 4.31*** | |
| GDP | -0.0005 | -0.14 | 0.0091 | 1.43 | |
| SOX | 0.1452 | 3.6*** | 0.2636 | 2.51** | |

Panel B: using Herfindahl as a measure of concentration

| FEE | High Litigation | | Low Litigation | | |
|---|---|---|---|---|---|
| | Coefficient | t-value | Coefficient | t-value | Chi-Squared |
| HI | -2.0245 | -4.71*** | 0.6893 | 1.84* | 22.72*** |
| SIZE | 0.5478 | 61.82*** | 0.5834 | 34.21*** | |
| CATA | 0.6419 | 11.8*** | 0.6057 | 5.83*** | |
| LOSS | 0.1144 | 4.64*** | 0.2128 | 4.72*** | |
| OPAT_TA | -0.1332 | -4.64*** | -0.1248 | -1.67* | |
| LEV | 0.5857 | 14.85*** | 0.3073 | 4.33*** | |
| GDP | 0.0037 | 1.11 | 0.0070 | 1.1 | |
| SOX | 0.1747 | 4.16*** | 0.2843 | 2.83*** | |

FEE is the natural log of total audit fees paid by the company;
CR2 is two firm concentration ratio;
HI is Herfindahl Index;
SIZE is the natural log of total assets;
CATA is the ratio of current assets to total assets;
LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;
OPAT_TA is the ratio of net profit to total assets;
LEV is the ratio of total liabilities to total assets;
GDP is the natural logarithm of GDP per capita in each country;
SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.
\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

**Table 11 - Multivariate Results – non-Big 4 Firms**

|  |  | Panel A<br>All non-Big 4 |  | Panel B<br>Excluding Australia |  |
| --- | --- | --- | --- | --- | --- |
| FEE | Pred. | Coef. | t-value | Coef. | t-value |
| CR2 | +/- | -0.0759 | -0.27 | -0.7248 | -2.04** |
| LITIG | + | -0.1939 | -6.07*** | 0.06731 | 2.59*** |
| SIZE | + | 0.43994 | 39.33*** | 0.49302 | 36.06*** |
| CATA | + | 0.31702 | 5.97*** | 0.3438 | 5.11*** |
| LOSS | + | 0.0364 | 1.33 | 0.15613 | 4.69*** |
| OPAT_TA | - | -0.0863 | -6.67*** | -0.0687 | -3.75*** |
| LEV | + | 0.12556 | 6.41*** | 0.10997 | 4.39*** |
| GDP | + | 0.01481 | 3.81*** | -0.0093 | -1.32 |
| SOX | + | 0.2275 | 2.12** | 0.36617 | 2.99*** |
|  |  |  |  |  |  |
| Country fixed effects |  |  | Yes |  | Yes |
| Year Fixed Effects |  |  | Yes |  | Yes |
| Industry Fixed Effects |  |  | Yes |  | Yes |
|  |  |  |  |  |  |
| N |  |  | 7045 |  | 2969 |
| R squared |  |  | 0.66 |  | 0.7 |

FEE is the natural log of total audit fees paid by the company;

CR2 is two firm concentration ratio;

SIZE is the natural log of total assets;

CATA is the ratio of current assets to total assets;

LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;

OPAT_TA is the ratio of net profit to total assets;

LEV is the ratio of total liabilities to total assets;

GDP is the GDP per capita in each country in thousands;

SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

**Table 12 - Effect of the Litigation Regime for non-Big N firms**

| FEE | High Litigation | | Low Litigation | | |
|---|---|---|---|---|---|
| | Coefficient | t-value | Coefficient | t-value | Chi-Squared |
| CR2 | 0.6779 | 1.91* | 0.4785 | 0.9 | 0.1 |
| SIZE | 0.4219 | 36.23*** | 0.5805 | 18.23*** | |
| CATA | 0.2930 | 5.37*** | 0.2762 | 1.63 | |
| LOSS | 0.0191 | 0.66 | 0.2108 | 2.74*** | |
| OPAT_TA | -0.0779 | -5.99*** | -0.0535 | -0.9 | |
| LEV | 0.1355 | 6.87*** | 0.0647 | 1.17 | |
| GDP | 0.0224 | 4.76*** | -0.0578 | -2.77*** | |
| SOX | 0.0104 | 0.08 | 0.5861 | 2.83*** | |

FEE is the natural log of total audit fees paid by the company;

CR2 is two firm concentration ratio;

SIZE is the natural log of total assets;

CATA is the ratio of current assets to total assets;

LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;

OPAT_TA is the ratio of net profit to total assets;

LEV is the ratio of total liabilities to total assets;

GDP is the GDP per capita in each country in thousands;

SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.

***, **, * - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

## Table 13 - Mediation Analysis

| Panel A | | | | Panel B | | |
|---|---|---|---|---|---|---|
| DAC | Coef. | t-value | | FEE | Coef. | t-value |
| CR2 | -52640 | -10.37*** | | CR2 | -0.7525 | -2.3** |
| WIN | -89.479 | -0.36 | | WIN | 0.20214 | 12.71*** |
| BIGN | 767.029 | 2.51** | | BIGN | 0.29303 | 14.86*** |
| SIZE | -60.274 | -0.67 | | SIZE | 0.54121 | 93.82*** |
| OPAT_TA | 13.5172 | 0.04 | | OPAT_TA | -0.2961 | -12.76*** |
| GROWTH | 85.8958 | 0.26 | | GROWTH | -0.0167 | -0.79 |
| LEV | -287.65 | -0.6 | | LEV | 0.54032 | 17.4*** |
| LOSS | -395.97 | -1.13 | | LOSS | 0.00514 | 0.23 |
| SOX | -3494 | -0.3 | | SOX | -0.0814 | -0.11 |
| GDP | 131.381 | 2.22** | | GDP | -0.0009 | -0.24 |

| Panel C | | | | | Z | P>|Z| |
|---|---|---|---|---|---|---|
| DAC | Coef | t-value | | | | |
| FEE | -505.83 | -2.84*** | | Sobel Test | 1.786 | 0.074 |
| CR2 | -53020 | -10.45*** | | Proportion of total | | |
| WIN | 12.7695 | 0.05 | | effect that is mediated | | -0.0072 |
| BIGN | 915.252 | 2.95*** | | | | |
| SIZE | 213.485 | 1.62 | | | | |
| OPAT_TA | -136.24 | -0.37 | | | | |
| GROWTH | 77.4505 | 0.23 | | | | |
| LEV | -14.343 | -0.03 | | | | |
| LOSS | -393.37 | -1.13 | | | | |
| SOX | -3535.2 | -0.3 | | | | |
| GDP | 130.909 | 2.21** | | | | |

DAC is absolute discretionary accruals;
FEE is the natural log of total audit fees paid by the company;
CR2 is two firm concentration ratio;
LITIG is Liability Index from Wingate (1997)
SIZE is the natural log of total assets;
CATA is the ratio of current assets to total assets;
LOSS is the indicator variable coded 1 if the company had a loss and 0 otherwise;
OPAT_TA is the ratio of net profit to total assets;
GROWTH is increase in revenues since prior year scaled by total assets;
LEV is the ratio of total liabilities to total assets;
GDP is the GDP per capita in each country in thousands of US dollars;
SOX is an indicator variable coded 1 if fiscal years are after 2001 and 0 otherwise.
\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

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# ACCEPTING FULL RESPONSIBILITY IN THE AUDIT OPINION: IMPLICATIONS FOR AUDIT QUALITY AND AUDIT FEES

## <u>Introduction</u>

This study examines the issue of accountability in financial reporting by focusing on a special type of audit opinion that allows an auditor to limit his or her accountability for an engagement. Current United States standards allow the principal auditor to disavow responsibility for parts of the audit which were performed by a third party auditor (AU-C Section 600). Such sharing of responsibility is accomplished by referencing third party auditors in the audit opinion and then indicating the part of the audit which was performed by that third party. Specifically, this study examines 1) audit quality implications related to such opinions, and 2) the relationship between having a shared opinion and audit fees.

The study is motivated by current differences between the United States and international standards. International standards (ISA 600) do not allow such a disclaimer: the principal auditor has to be comfortable with all the procedures performed – and conclusions drawn – by other auditors, because no reference to other auditors is permitted under international standards. Therefore under international standards the principal auditor is fully accountable for the entire audit. This study addresses two issues related to disclaiming responsibility for the work performed by the component auditor: is audit quality negatively affected and do such audits cost less?

Prior research has confirmed that accountability affects positively the quality of audit procedures (Johnson et al., 1991; Kennedy, 1993; Asare et al., 2000). If the principal auditor is not allowed – or does not elect – to refer to the work of the second auditor in the audit opinion,

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then the principal auditor is fully accountable for the entire audit. Presumably, in these cases, the principal auditor is comfortable with the procedures performed by a component auditor and the audit quality produced by the component auditor.[17] This paper tests whether audit quality is higher in cases where the principal auditor assumes full responsibility for the audit, as compared to cases where a third party auditor is referenced.

Involving a third party auditor and referencing them in the audit opinion might also be motivated by cost savings: the principal auditor might involve a third party auditor if such auditor can perform a part of the audit for a low fee. This paper analyzes whether the audit fees are different between shared audit opinions and cases where no third party auditor is referenced.

Audit quality is measured using discretionary accruals. All companies whose 10-k report included a reference to a third party auditor were matched by current year return on assets with a control company. The results show that the absolute discretionary accruals are significantly higher (meaning the audit quality is significantly lower) for the firms whose audit opinion referenced a third party auditor. The results provide some evidence that audit fees are lower in shared responsibility situations; these results are stronger if observations from 2012 are excluded. This could be driven by the fact that starting in 2012 new regulations increased involvement of the principal auditor in group audits, which would allow the principal auditor to ensure that the quality of work by the component auditor is acceptable by the principal auditor's standards. Such additional involvement on the part of the principal auditor would also increase billable hours, which would lead to higher fees.

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17 Component auditor is defined as an auditor who, at the request of the group engagement team, performs work on financial information related to a component for the group audit.

This paper contributes to research, regulation, and practice. This paper addresses the current regulatory debate about the responsibility of the principal auditor in the group audit environment[18]. To the extent that audit committees are interested in having a high quality audit, they might be concerned about having their auditors involve third parties and not assuming the full responsibility for their work. Finally, audit firms can find the study important because it addresses audit quality and the audit fee implications of engagements that have shared responsibility.

The paper is organized in the following sections: institutional background, theoretical background and hypotheses development, methods, sample selection procedures, results, and conclusion.

## Institutional Background

### *United States Standards*

Audits of large, geographically dispersed clients can require the coordination of auditors in multiple locations. In certain cases, legal restrictions, convenience or cost may cause the principal auditor to involve a third party public accounting firm to perform parts of the audit. This may occur in situations where, for example, local regulation prevents non-domestic auditors

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[18] The term group audit is used by IAASB (2007) to refer to the audit of group financial statements. It is similar to the audit of consolidated financial statements in the US. A component is an entity or business activity for which group or component management prepares financial information that should be included in the group financial statements (IAASB, 2007).

from conducting attest engagements (Japan, India or Pakistan), or where a large client may have operations in regions where the auditor does not have local offices[19].

In the US, group audits followed the guidance from AU Section 543 from 1972 until 2012.  AU-C Section 600, Special Considerations—Audits of Group Financial Statements (Including the Work of Component Auditors) superseded AU Section 543 for all audits for the periods beginning after December 15, 2012.  Since the sample used in this study covers fiscal years 2004-2012, both AU 543 as well as AU-C Section 600 are described in this section.

*AU Section 543*

When using the work of another auditor, the principal auditor addresses two issues.  First, the accounting firm must determine whether it performed a sufficient portion of the audit to be considered the principal auditor.  Second, the accounting firm needs to determine if the work of a third party auditor will be referenced.  The principal auditor must determine whether or not it is willing to accept responsibility for the work of the other auditors.  If the principal auditor decides that it is unwilling to assume the responsibility, then it must reference the work of the other auditors in the audit opinion.

An example of such reference is provided in AU Section 543, par. 09 (AICPA, 1972):

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[19] Shared opinions in the US are different from the audits in France.  In the US the principal auditor can choose to involve a component auditor, while in France each public company must be audited by two auditors, who divide the work (i.e. one does not serve as an independent reviewer of the other).  The rationales behind this, as summarized in Francis et al. (2009), are 1) to avoid any delays in case of default of one auditor; and 2) to protect auditor independence. Under these conditions, US GAAS permits the principal auditor to rely on the work of the other firm. Further, the principal auditor is permitted to share its responsibility for the portion conducted by the other firm by acknowledging its reliance on the work of another auditor in the audit opinion.

"We did not audit the financial statements of B Company, a wholly-owned subsidiary, which statements reflect total assets and revenues constituting 20 percent and 22 percent, respectively, of the related consolidated totals".

Assuming the auditor does accept full responsibility for the entire engagement, AU Section 543, par. 12., dictated that the firm should obtain (among other items) "b) a list of significant risks, the auditor's responses, and the results of the auditor's related procedures, c) sufficient information relating to significant findings or issues that are inconsistent with or contradict the auditor's final conclusions(…); d) any findings affecting the consolidating or combining of accounts in the consolidated financial statements" (AICPA, 1972). This information was deemed necessary as the principal auditor was required to be comfortable with the work performed by other auditors, in cases where the principal auditor was willing to accept the full responsibility and potential legal liability associated with the audit.

In cases where the principal auditor chose to reference a third party auditor, the principal auditor did not assume responsibility of the work performed by the third party. In such cases, AU Section 543, par. 10 dictated that the principal auditor "should make inquiries concerning the professional reputation and independence of the other auditor. He also should adopt appropriate measures to assure the coordination of his activities with those of the other auditor in order to achieve a proper review of matters affecting the consolidating or combining of accounts in the financial statements", however the principal auditor did not review the work by other auditors, and the responsibility stayed with the third party.

*AU-C Section 600*

AU-C Section 600 made the requirement in the US more similar to the requirements under ISA 600, specifically in the areas related to risk assessment, materiality, and responsibility. AU Section 543 did not include requirements related to the performance of risk assessment. AU

Section 543 also did not include requirements to assess materiality of the component auditor. AU-C Section 600 addresses these limitations by requiring the group engagement team to establish materiality for the component auditor and requiring the group engagement team to "be involved in the risk assessment of the component to identify significant risks of material misstatement of the group financial statements" (par. 56).

AU-C Section 600 also increases the responsibility of the group engagement partner. According to paragraph 13, "the group engagement partner is responsible for (1) the direction, supervision, and performance of the group audit engagement in compliance with professional standards, applicable regulatory and legal requirements, and the firm's policies and procedures; and (2) determining whether the auditor's report that is issued is appropriate in the circumstances" (AICPA, 2011).

While AU-C Section 600 brings the requirements related to group audits closer to the requirements under ISA 600, one main difference between the US and the international standards still exists: the group engagement team can still chose to "not assume responsibility for, and accordingly make reference to, the audit of a component auditor in the auditor's report on the group financial statements" (par. 08).

### *International Standards*

Looking beyond the US, a number of countries have adopted International Standards of Auditing as promulgated by the International Auditing and Assurance Standards Board (IAASB). In accordance with IAASB standards, international group audits for periods beginning on or after December 15, 2009 have to follow the guidelines in ISA 600.  Similar to the US standards, ISA 600 requires principal auditors to understand  "(a) Whether the component auditor understands

and will comply with the ethical requirements that are relevant to the group audit and, in particular, is independent; (b) The component auditor's professional competence (IAASB, 2007). In particular, ISA 600 states: "the group engagement partner[20] is responsible for the direction, supervision and performance of the group audit engagement in compliance with professional standards and regulatory and legal requirements, and whether the auditor's report that is issued is appropriate in the circumstances." As a result, the auditor's report on the group financial statements "shall not refer to a component auditor, unless required by law or regulation to include such reference" (IAASB, 2007).

Thus, under international requirements, the principal auditor carries the full responsibility for the audit. Therefore under ISA 600, a group audit is viewed as an integrated process involving multiple firms but where one firm is ultimately responsible for the final opinion. The standard does not permit a division of responsibility. Under such reporting requirements, the principal auditor is assumed to be more highly motivated to exercise due professional care over the entire engagement in order to avoid legal liability issues or loss of reputation.

### Shared Opinions, Audit Quality and Audit Fees

Accountability is an important concept in quality control of financial statement audits. Auditors make their decision considering multiple consequences of their actions. An example of a consequence is a law-suit filed because of an audit failure, which can hurt the audit firm economically if it is forced to pay a settlement. Litigation can also hurt audit firms by damaging their reputation. Auditors are accountable for the procedures performed during their audits. An

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20 Group engagement partner – the partner or other person in the firm who is responsible for the group audit engagement and its performance, and for the auditor's report on the group financial statements that is issued on behalf of the audit firm (IAASB, 2007).

auditor is likely to lose law-suits in cases when the law suit is based on a failure in audit procedures for which the firm was accountable. Consequently, if auditors are accountable for their work, they are expected to exercise the best due professional care in order to minimize the chance of an audit failure and resulting damaging consequences. The difference between the US and international standards discussed relates to the difference in accountability – ISA 600 requires the principal auditor to be accountable for the entire audit, while AU-C Section 600 allows the principal auditors to limit their accountability.

Referencing a component auditor in the report implies that the principal auditor is not accountable for the work performed by a third party. Prior research has examined the relationship between accountability and quality of audit work. Accountability has been shown to increase accuracy (Ashton, 1990), consensus among auditors (Johnson et al., 1991) and effort (Asare, 2000). Accountability has also been shown to reduce effort related biases (Kennedy, 1993). To summarize, prior literature has shown a positive relation between accountability and auditor judgment, and good auditor judgment is necessary for a high quality audit. One of the characteristics of high quality audits is mitigation of earnings management, which refers to manipulations of accounting numbers by management for opportunistic reasons (DeAngelo, 1981; Becker et al., 1993). Therefore accountability of the auditor is expected to be associated with reduced earnings management.

As noted earlier, involvement of a third party auditor may be more common for an audit of a subsidiary or a segment. The fact that an entity is a subsidiary/segment does not necessarily mean that the entity is more or less likely to have earnings management. Furthermore, the fact that the entity is a subsidiary/segment does not mean that that the auditors are more or less likely to detect earnings management. Where having a subsidiary makes a difference for the purposes

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of detecting earnings management is the accountability of the principal auditor. When the opinion is not shared, the principal auditor is accountable for the entire audit. This suggests that the principal auditor is sufficiently comfortable with the numbers presented by a subsidiary such that the principal auditor is willing to assume full responsibility. The principal auditor accomplishes this by performing a review of the component auditor's work. On the other hand, when the audit opinion is shared, then the principal auditor is not accountable for the portion completed by the component auditor, and the principal auditor is not required to perform a full review. In sum, when the opinion is not shared, the component auditor performs the audit procedures, but the work is subsequently reviewed by the principal auditor, which creates additional assurance that the financials of the component are not materially misstated.

I hypothesize that assuming responsibility for the work performed by other auditors would increase audit quality. This means that if some responsibility is disclaimed in the opinion the audit quality would be on average lower, which leads to the following hypothesis.

*H1: Lower audit quality will be associated with audit engagements that issue a divided responsibility audit opinion.*

One of the reasons why the principal auditor can chose to involve a third party auditor is cost considerations: a certain part of the engagement can be completed by a component auditor for less than what would it cost the principal auditor. This situation could occur where the engagement requires multi-location work. The principal auditor might not have an office near the required location, which would lead to travel costs. As such if the principal auditor determines that it would be more cost effective to involve a third party, a group audit would take place. Furthermore, if the principal auditor is not accepting responsibility for the opinion, the principal auditor's risk is lower, which would lead to a lower risk-based fee premium.

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Similarly, if the principal auditor disclaims responsibility, then the principal auditor might chose to involve a lower quality (and therefore potentially less costly) component auditor. Finally, the principal auditor also might not perform a full review of the work performed by a component auditor (since a full review is not required), which again would lead to lower costs. In combination, this logic leads to the second hypothesis:

*H2: Lower fees will be associated with audit engagements that issue a divided responsibility audit opinion.*

## Methods

### *Measure of audit quality*

Audit quality is measured using the absolute value of discretionary accruals (Francis, 1999). The modified Jones (1991) model is used to estimate discretionary accruals. Discretionary accruals are a measure of earnings management: high quality audits are presumed to limit earnings management by constraining inappropriate booking of accruals, whether they are income increasing (positive) or income decreasing (negative). Therefore the absolute value of accruals is used as a proxy for measure audit quality. Discretionary accruals are calculated following the steps discussed below.

First, the modified Jones (1991) model (see Equation 11 below) is estimated by industry-year using an ordinary least squares regression. The equation used in this analysis includes an intercept, which is consistent with Kothari et al. (2005), who use the equation with the constant to control for heteroscedasticity and allow for more symmetry in the measures.

$$ACCR_t/TA_{t-1} = \beta_0 + \beta_1 * 1/ TA_{t-1} + \beta_2 * (REVREC_t)/ TA_{t-1} + \beta_3 * PPE_t/ TA_{t-1} + \varepsilon \qquad (11)$$

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ACCR refer to total accruals calculated as net income before extraordinary items and discontinued operations minus operating cash flows (Krishnan, 2003). $TA_{t-1}$ are total assets in the prior period. REVREC is calculated as the change of revenue from the prior period minus the change of receivables from the prior period. Finally PPE refers to gross property, plant and equipment. Discretionary accruals are obtained by saving the residuals from Equation 11. All variables in Equation 11 are winsorised at the $1^{st}$ and $99^{th}$ percentiles.

*Hypotheses testing*

*Hypothesis 1*

The following equation is used to test Hypothesis 1:

$$DAC = \beta_0 + \beta_1 SHARE + \beta_2 BIG4P + \beta_3 BIG4C + \beta_4 SIZE + \beta_5 GROWTH + \beta_6 LOSS + \beta_7 MERGE + \beta_8 RESTRUCT + \text{industry fixed effects} + \text{year fixed effects} + \varepsilon \quad (12)$$

DAC = the absolute value of discretionary accruals calculated in equation 11 as described above;

SHARE = a dichotomous variable coded 1 if the observations represent a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

GROWTH = the change in revenue from prior year scaled by lagged total assets;

LOSS = a dichotomous variable coded 1 if the company had a loss and 0 otherwise;

MERGE = the sum of acquisition and merger items divided by total assets;

RESTRUCT = the sum of restructuring items divided by total assets.

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SHARE is the independent variable of interest to test hypothesis 1. H1 predicts that if a third party auditor is referenced in the audit opinion, the audit quality will be lower. Therefore the discretionary accruals are expected to be higher, and the expected coefficient is positive. A large body of accounting research has focused on the differences between the BigN and non-BigN firms. DeAngelo (1981) argues that auditor size is a surrogate for audit quality. Francis et al. (1999) show that the clients of the Big N firms have lower discretionary accruals. As such, I expect the clients of Big 4 firms to have lower discretionary accruals than the client of non-Big 4 auditors. Therefore the expected coefficients on the BIG4P and BIG4C variable are negative. SIZE, GROWTH, and LOSS are control variables commonly used in prior related research. Results from Chan et al. (2008) and Nagy (2010) show that large firms have lower discretionary accruals. Larger firms are followed closely by analysts, have better internal control environments and highly trained personnel, which leads to higher quality of financial reporting. Therefore the expected coefficient of SIZE is negative.

Fast growing firms operate in a rapidly changing environment; therefore such firms are likely to have more discretion in their financial reporting. Consistent with this claim, Ashbaugh-Skaife et al. (2009) and Doyle et al. (2007) show that fast growing firms have higher discretionary accruals. Thus, a positive coefficient on the variable GROWTH is expected. Measuring revenue growth as change in revenues scaled by total assets is consistent with Ettredge et al. (2008) and used here instead of a simple percentage change in revenue in order to include companies that did not have revenues in the prior period.

Management of poorly performing companies is more likely to engage in earnings management to create an appearance of profitability (income increasing accruals). On the other hand, management may be booking additional losses in a bad year (income decreasing accruals)

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in order to appear more profitable in the following year ("cookie jar reserves"). As such, the expected coefficient on LOSS is positive (Ashbaugh-Skaife et al., 2009).

Merging and restructuring activities lead to a number of changes in the company, which would result in more discretion in management's decision making, and thus opportunities for earnings management. Furthermore, Doyle et al. (2007) show a positive relationship between discretionary accruals and restructuring charges. Consequently, the expected coefficients for both MERGE and RESTRUCT are positive.

*Hypothesis 2.*

The following equation is used to test Hypothesis 2:

$$FEE = \beta_0 + \beta_1 SHARE + \beta_2 BIG4P + \beta_3 BIG4C + \beta_4 SIZE + \beta_5 LEV + \beta_6 INVREC + \beta_7 ROA + \beta_8 LOSS + \beta_9 NEWAUD + \text{industry fixed effects} + \text{year fixed effects} + \varepsilon \quad (13)$$

SHARE, BIG4P, BIG4C, SIZE, and LOSS were described in the previous section.

FEE = natural logarithm of audit fees;

LEV = total liabilities divided by total assets;

INVREC = inventories plus receivables divided by total assets;

ROA = net income divided by total assets;

NEWAUD = a dichotomous variable coded 1 if this is the initial audit engagement, 0 otherwise.

SHARE is the independent variable of interest for testing hypothesis 2. Since I expect shared responsibility audits to be associated with lower fees, I expect a negative coefficient for SHARE. Prior research showed that larger companies pay higher fees (Simunic, 1980). As such, the expected coefficient of SIZE is positive. Prior research also suggests that Big 4 firms charge a premium for their services (Choi et al., 2008, Basioudis and Francis, 2007). Thus I expect a positive coefficient for BIG4P and BIG4C. Audit firms also charge a premium for

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risky clients. LEV, ROA, and LOSS are included in the model to control for a company's risk. Companies which are highly leveraged and have a loss are likely to be risky and require additional audit procedures (and consequently higher fees), as such the expected coefficients of LEV and LOSS are positive (Choi et al, 2010; Simunic and Stein, 1996). Profitable companies are less risky, therefore I expect a negative coefficient on ROA (Ghosh and Lustgarten, 2006). INVREC is a proxy for a company's complexity, which is expected to be associated with higher audit fees; as such the expected coefficient of INVREC is positive (Choi et al., 2008). Prior research showed that initial audit engagements are associated with reduced audit fees, because the firms tend to charge reduced fees to their client in the initial year (Francis, 1984; Francis and Simon, 1987); consequently the expected coefficient of NEWAUD is negative.

## Sample Selection

EDGAR allows searching for full text filings in the past four years. Data for this study was collected in 2011 and 2013, so EDGAR had full text filings available for the years 2007-2012. EDGAR database was searched for the phrase "the report of the other auditors" in order to identify the companies that used multiple auditors, and where the principal auditor referenced the other auditor. Review of the results showed that some companies reference the work by third party auditors in multiple years. Annual reports for such companies were obtained for the periods prior to 2007; this allowed expanding the sample to include observations from 2004-2006. However, in many cases the principal auditor referenced another auditor's work performed in prior periods, but not in the current year; (e.g. "we have audited the accompanying balance sheet of as of May 31, 2011 … We did not audit the Company's financial statements as of and for the year ended May 31, 2010, … which were audited by other auditors.) After such

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observations were eliminated, 138 companies were left.  Reports of the vast majority of the

companies referenced other auditors for their work performed on a subsidiary, e.g. "We did not

audit the financial statements of Orbit/FR Engineering, Ltd., a wholly owned subsidiary, which

statements reflect total assets of $7,944,000 and $6,645,000 as of December 31, 2007 and 2006,

respectively, and total revenues of $14,530,000, $10,202,000, and $9,160,000 for each of the

three years in the period ended December 31, 2007".  Several reports referenced auditing of an

investment, e.g. "we did not audit the financial statements of Tarsa Therapeutics, Inc., the

investment in which, as discussed in Note 10 to the financial statements, is accounted for by the

equity method of accounting".  138 observations from 2004 to 2012 which referenced a third

party auditor in their 10-k filings were identified.  However only 109 of them identified the

component auditors and had the required data to calculate all variables for the quality analysis.

And only 94 of them had all the variables to perform the fee analysis.

## *Quality Analysis*

Data to calculate discretionary accruals and control variables were obtained from the

Compustat database.  Consistent with prior research (Krishnan, 2003; Ayers et al., 2006), all

observations from the financial services (SIC codes 6000 to 6999) and utilities (SIC code 4000

to 4999) are excluded.  Companies included in Compustat as non-classifiable establishments

(industries 9900 to 9999) are also excluded from the sample: the cross sectional Jones model is

estimated by industry because companies in the same industries have similar reporting

requirements and business cycles, and these assumptions cannot be made about non-classifiable

establishments.  Consistent with Kothari et al. (2005), two digit industry codes which have less

than 10 observations per given year were also excluded from the sample.  Finally all

observations with insufficient data to estimate the Jones model or calculate control variables

were also excluded.  Compustat does not identify component auditors, as such this information was hand collected from 10-k reports.  Most reports either included a report from the component auditor in the 10-k, or identified the component auditor in one of the Exhibits to the form 10-k.

After identifying the companies whose annual reports referenced other auditors who performed parts of the audit in the current periods I selected one control firm for each of the 109 firms in our sample.   As noted in the previous section, audit quality is examined using discretionary accruals.  Kothari et al. (2005) recommend matching companies based on industry and return on assets for the current year in order to use discretionary accruals.  As such all companies in our sample were matched by current year ROA with the control firm provided that the control firm 1) was in the same two digit SIC industry, 2) was in the same fiscal year, 3) had all the data to calculate discretionary accruals, and 4) had the data to calculate all control variables.  Firms which did not meet these criteria were disqualified and the next closest firm based on the current year ROA was examined for qualification as a control firm.  The final sample consists of 218 observations (109 test company-years and 109 control company-years) which include 31 unique companies.

### *Fee Analysis*

Data to calculate audit fees was obtained from the Audit Analytics Database and hand collected for the observations with missing data. Data for control variables was obtained from Compustat.  The criteria for sample selection to test Hypothesis 2 are similar to the criteria used in the quality analysis.  The only exception is that industries with less than 10 observations in a given year were no longer excluded.  Since company size is the one of the main drivers of audit fees (Simunic, 1980), I matched all the test companies by total assets with a control firm, given

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that the control firm 1) was in the same two digit SIC industry, 2) had the same fiscal year, 3) had the fee data, and 4) had the data to calculate all control variables. The final sample consists of 188 observations (94 test company-years and 94 control company-years) which include 31 unique companies.

## Results

### H1: Quality analysis

*Descriptive Statistics and Univariate Tests*

The final sample is summarized Tables 14 and 15. There are 218 total observations consisting of 109 test firms (firms whose annual reports make a reference to other auditors) and 109 control firms. Table 14 (Columns C and D) includes a summary by industry, indicating that chemicals and allied products is the industry with the most split responsibility audit reports. Table 15 (Columns B and C) shows distribution by year; years 2004-2006 had fewer observations than other years due to the fact the full text search in EDGAR was not available for the years 2004-2006.

Table 16 includes descriptive statistics for the full sample, test firms, and controls firms respectively. The table also includes results of univariate tests for all variables between the test and control samples. Univariate analyses show that test firms are larger[21] than control firms and have more restructuring charges (however the difference is only marginally significant). Table

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21 Larger firms have been shown to have smaller discretionary accruals (Francis et al., 1999). The test sample is comprised of larger firms, therefore if the size differential does, in part, account for any differences, it should be biasing against my results of finding larger discretionary accruals for the test sample.

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18 includes a correlation matrix for all variables.  Absolute discretionary accruals are significantly negatively correlated with SIZE, BIG4P, and positively correlated with MERGE.

*Multivariate Results*

A positive relationship was predicted between having a split responsibility in the audit opinion and the absolute value of discretionary accruals in Hypothesis 1.  The hypotheses are tested using the pooled cross sectional regression presented in Equation 12.  The model is estimated using robust standard errors to adjust for heteroscedasticity and company level clustering.  Results of the regression are included in Table 20.  The model has relatively high explanatory power, as suggested by adjusted R-squared of almost 0.39.  The coefficient for SHARE is significantly positive at the 5% level (t=2.06, p-value = 0.042).  This shows that those firms that involve more than one auditor and whose principal auditor does not assume the full responsibility for the audit have significantly higher absolute discretionary accruals than the control firms.  As such, the results provide support for the hypothesis that audit quality suffers in cases where the audit partner does not accept full responsibility for the audit.  The control variable SIZE was statistically significantly negative (t=-2.25, p=0.009), as expected, which shows that the large firms tend to have lower discretionary accruals.  Surprisingly, neither BIG4P nor BIG4C were associated with higher earnings quality.  MERGE was significantly associated with absolute discretionary accruals (t=6.14, p<0.001).  The other control variables were not significant.  In order to determine if the model has a muilticollinearity problem, the Variance Inflation Factors (VIF's) of the regression were examined.  No VIF's were greater than the cut-off value of 10.

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*Descriptive Statistics and Univariate Tests*

Table 14 includes a summary of the sample by industry (Columns E and F) and Table 15 includes a summary by fiscal year (Columns D and E). The sample consists of 94 test companies (companies whose 10-k made a reference to parts of the audit performed by third party auditors) and 94 control companies. The sample used in testing Hypothesis 2 has fewer observations than the sample used for testing Hypothesis 1 due to data availability. Similar to the sample used in the quality analysis, Chemicals and Allied Products has more split responsibility reports than other industries in the sample. Descriptive statistics and univariate results included in Table 17 suggest that companies with split responsibility reports are more leveraged and are marginally (significant at the 10% level) more likely to have an auditor switch. A correlation matrix is included in Table 19. Audit fees are significantly positively correlated with having a Big 4 auditor (BIG4P as well as BIG4C), SIZE, ROA, and INVREC; fees are significantly negatively correlated with having a loss.

*Multivariate Results*

Hypothesis 2 is tested by estimating Equation 13. Similar to the quality analysis, the equation is estimated using robust standard errors and clustering by company. Hypothesis 2 predicts a negative relationship between audit fees and having a shared opinion. Multivariate results are summarized in Table 21. The coefficient of SHARE is negative and marginally significant (t-value of -1.75), providing some support for the hypothesis. As expected, the coefficients for BIG4P, SIZE, and INVREC are significantly positive, and the coefficient for ROA is significantly negative. Other control variables are not significant. VIF's of the regression were examined to determine if there are multicollinearity issues. The highest VIF is

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11.79, four variables in the regression have VIF's over 10. Three of those variables are dummy variables for industries, when the equation was re-estimated excluding observations from those industries, the results remained qualitatively the same. The other variable which has a VIF of over 10 is SIZE (11.74). Since size is the most important variable in determining audit fees and VIF is only slightly over 10, the variable was retained in the model.

Because AU-C Section 600 brought changes in requirement for group audits in 2012, I re-estimated Equation 13 excluding observations from that year. The results (untabulated) show that the coefficient of SHARE became more significantly negative (t=-2.09, p=.039). This suggests that under AU 543 requirements, when the principal auditor had less involvement in the work of the component auditor, audit fees were significantly lower in split responsibility reports. However, after AU-C Section 600 required additional involvement on the part of the principal auditor, this led to higher audit fees. I re-estimated Equation 3 using only the observations from 2012, and the coefficient on SHARE was significantly positive (t=2.69, p=.014). However these results are only based on 20 observations, and thus might not be representative of the population.

<u>Discussion and Conclusions</u>

The purpose of this study was to determine the effect of auditor's ability to disclaim responsibility on audit quality and audit fees. The study was motivated by the differences between the US and international standards. Under IAS 600, which is used internationally, the principal auditor assumes responsibility for any work done by a component auditor. This means that the principal auditor is fully accountable for the <u>entire</u> audit: "although other auditors may

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perform work on the financial information of components for the group audit and as such are responsible for their overall findings, conclusions or opinion in their memoranda or reports of work performed, the group auditor alone is responsible for the group audit opinion." (International Federation of Accountants, 2007). On the other hand the standards in the United States allow the principal auditor to disclaim responsibility for any work performed by a third party by referencing that party in the audit opinion and indicating the part of the audit that that party performed. Prior research showed a positive relationship between accountability and auditor judgment (Ashton, 1990, Johnson et al., 1991, Asare, 2000), which suggests that accountability is important for high quality audits. Since US standards do not require the principal auditor to be accountable for the work of the component auditor by issuing a shared opinion, audit quality can suffer when the opinion is shared. This paper examines this important difference between the US with respect to quality of shared opinions.

Audit quality was measured using discretionary accruals estimated using the modified Jones (1991) model. The sample consists of firms whose audit opinions referenced a third party auditor. Each of these firms was matched with a control firm based on current year's industry and return on assets (for the quality analysis) or current year's industry and total assets (for the fee analysis). The results showed that companies whose auditors disclaimed responsibility for parts of the audit had significantly higher discretionary accruals, suggesting that the quality of their audits was lower. The results also suggested that having a shared responsibility report was associated with lower audit fees; this was more pronounced in the years which were under guidance from AU 543, which required less involvement from the principal auditor than new requirements under AU-C Section 600. Essentially the results show that in cases where the principal auditor disclaims responsibility for parts performed by a component auditor, the

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principal auditor tends to hire a less costly component auditor (as suggested by the fee analysis), which leads to lower quality audits (as suggested by the quality analysis).

The results are important for researchers, regulators, and practice. This is the first paper in accounting research which examines audit quality issues related to the principal auditor's ability to disclaim responsibility for a portion of the audit. AU-C Section 600 increases the accountability of the group engagement partner for the work of component auditors. Prior research shows that increased accountability leads to higher quality audits. However AU-C Section 600 still allows referencing another auditor in the opinion. GAO issued a comment on shared opinions, stating that allowing the principal auditor to disclaim responsibility for component auditor's work "can improve audit efficiency for the group auditor without sacrificing effectiveness" (Government Accountability Office, 2009). Results in this study suggest that while there are some efficiencies associated with shared opinions (lower audit fees), effectiveness is sacrificed (lower audit quality). Finally, with respect to practice, assuming the clients are interested in high quality audits, the current study's results might suggest that companies should have their auditor perform the full audit themselves or assume full responsibility for the work performed.

This study brings forth possible avenues for future research. First, since the sample used in this study was too small to investigate the differences between regional and small accounting firms, future research can expand the sample and examine such differences. Further, behavioral research can focus on the legal liability issues associated with split responsibility of auditors by analyzing jurors' or lawyers' perceptions of such relationships.

*Characteristics of Companies with Shared Opinions*

Shared responsibility is an under-researched topic, and prior research does not show which company characteristics increase the likelihood of having a shared audit opinion. Thus characteristics listed below are based on professional literature and anecdotal evidence gained from discussion with the personnel involved with audit engagements that generated shared responsibility reports. Several characteristics could potentially be associated with the likelihood of having a shared responsibility audit opinion.

- Geographical location: location of segments and subsidiaries, international operations, and small number of office locations can increase the likelihood of receiving a shared opinion.

  o Discussion with audit personnel and review of professional literature (Georgiades, 2008) indicated that shared opinions are more likely when a company has large segments or subsidiaries that are audited by a second audit firm. The decision to have a different auditor for a subsidiary could be due to the fact that the subsidiary might be located in an area where the principal auditor does not have an office. Alternatively, the parent company might have acquired a subsidiary and allowed the subsidiary to retain its auditor. This can be due to client preferences, perhaps driven by a long-standing, pre-existing relationship between a subsidiary and its auditor. The more subsidiaries the company has, the greater is the possibility of having one (or more) of them audited by a different firm, which

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could be referenced in the audit opinion.   The same logic as explained above for a number of subsidiaries would also apply to the segments.

- o The existence of foreign operations maybe associated with a shared opinion. Some countries have restrictions placed on what part of an audit (if any) can be performed by a foreign firm; as such, involving a local component auditor could be the only way to complete the audit.  Note: Compustat database does not have information on the number of foreign operation, but instead it shows how much foreign tax a company pays.  High foreign tax expenses are likely to be associated with multiple foreign operations.  As such, foreign tax expense will be used as a proxy for the number of foreign operations.

- o As noted above, the principal auditor can engage a component auditor because a principal auditor does not have an office in a certain location.  The Big 4 have offices all over the world, while many non-Big 4 firms are regional and local. Therefore non-Big 4 auditors are relatively more likely to face a situation where an audit has to be performed in a location where the firm does not have an office than the Big 4 firms.   Therefore, having a non-Big 4 auditor is expected to be associated with having a shared audit opinion.

- Risk: client's bankruptcy risk and poor operating performance may be associated with receiving a shared opinion.

  - o If the company is considered to be risky, the principal auditor might not want to assume any additional risk by assuming responsibility for the work performed by a component auditor.  Companies can be considered risky if their operating

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performance is low, and if they are facing financial distress (Ashbaugh-Skaife et al., 2009). Therefore companies with shared audit opinions may be more likely to have a negative return on assets and have a high probability of bankruptcy, as measured by Zmijewski (1984) score.

The following logit equation is used to analyze which characteristics lead to referencing a third party auditor.

$$SHARE = \beta_0 + \beta_1 SUBS + \beta_2 SEGS + \beta_3 FOREIGN + \beta_4 ZSCORE + \beta_5 ROA + \beta_6 * NONBIG4$$

SHARE = an indicator variable coded 1 if there is a component auditor is referenced in the audit opinion and 0 otherwise;

SUBS = equity in earnings – unconsolidated subsidiaries scaled by total assets[22];

SEGS = natural log of the number of reported segments;

FOREIGN = foreign tax expense scaled by total assets;

ZSCORE = Zmijewski (1984) bankruptcy score;

ROA = return on assets;

NONBIG4 = indicator variable coded 1 if the audit firms is non-Big 4, 0 otherwise.

The equation above was estimated by year, however the results were not significant. This could be partly due to the fact that there are very few observations with shared opinions each year.

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[22] Equity in earnings (unconsolidated subsidiaries) refers to parent company's portion of unremitted earnings from an unconsolidated subsidiary. Compustat does not include the number of subsidiaries for each company, as such equity in earnings (unconsolidated subsidiaries) is used as a proxy for the number of subsidiaries.

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Tables

**Table 14 – Industry Summary**

| A | B | C | D | E | F |
|---|---|---|---|---|---|
| | | Quality | | Fees | |
| SIC | Industry | Total | Percent of Total | Total | Percent of Total |
| 10 | Metal Mining | 8 | 3.67% | 8 | 4.26% |
| 12 | Coal Mining | 2 | 0.92% | 0 | 0.00% |
| 13 | Oil and Gas Extraction | 14 | 6.42% | 10 | 5.32% |
| 20 | Food and Kindred Products | 0 | 0.00% | 2 | 1.06% |
| 22 | Textile Mill Products | 4 | 1.83% | 4 | 2.13% |
| 25 | Furniture and Fixtures | 4 | 1.83% | 4 | 2.13% |
| 27 | Printing, Publishing and Allied Industries | 8 | 3.67% | 6 | 3.19% |
| 28 | Chemicals and Allied Products | 28 | 12.84% | 26 | 13.83% |
| 32 | Stone, Clay, Glass, and Concrete Products | 4 | 1.83% | 2 | 1.06% |
| 34 | Fabricated Metal Products, Except Machinery & Transport Equipment | 8 | 3.67% | 8 | 4.26% |
| 35 | Industrial and Commercial Machinery and Computer Equipment | 12 | 5.50% | 12 | 6.38% |
| 36 | Electronic, Electrical Equipment & Components, Except Computer Equipment | 18 | 8.26% | 16 | 8.51% |
| 37 | Transportation Equipment | 10 | 4.59% | 10 | 5.32% |
| 38 | Measure/Analyze/Control Instruments; Photo/Med/Opt Gds; Watches/Clocks | 10 | 4.59% | 8 | 4.26% |
| 39 | Miscellaneous Manufacturing Industries | 4 | 1.83% | 4 | 2.13% |
| 50 | Wholesale Trade - Durable Goods | 12 | 5.50% | 8 | 4.26% |
| 51 | Wholesale Trade - Nondurable Goods | 10 | 4.59% | 6 | 3.19% |
| 55 | Automotive Dealers and Gasoline Service Stations | 18 | 8.26% | 16 | 8.51% |
| 73 | Business Services | 22 | 10.09% | 16 | 8.51% |
| 79 | Amusement and Recreation Services | 10 | 4.59% | 10 | 5.32% |
| 87 | Engineering, Accounting, Research, Management & Related Services | 12 | 5.50% | 12 | 6.38% |
| Total | | 218 | 100.00% | 188 | 100.00% |

**Table 15 - Summary by Year**

| A | B | C | D | E |
|---|---|---|---|---|
| | **Quality** | | **Fees** | |
| **Fiscal Year** | **Number of Observations** | **Percent of Total** | **Number of Observations** | **Percent of Total** |
| 2004 | 8 | 3.67% | 0 | 0.00% |
| 2005 | 14 | 6.42% | 16 | 8.51% |
| 2006 | 18 | 8.26% | 18 | 9.57% |
| 2007 | 28 | 12.84% | 26 | 13.83% |
| 2008 | 28 | 12.84% | 24 | 12.77% |
| 2009 | 34 | 15.60% | 28 | 14.89% |
| 2010 | 28 | 12.84% | 24 | 12.77% |
| 2011 | 36 | 16.51% | 32 | 17.02% |
| 2012 | 24 | 11.01% | 20 | 10.64% |
| Total | 218 | 100.00% | 188 | 100.00% |

**Table 16 - Descriptive Statistics and Univariate Tests – Quality Analysis**

|  | Full sample | | Test sample | | Control sample | | |
|---|---|---|---|---|---|---|---|
|  | Mean | _SD_ | Mean | _SD_ | Mean | _SD_ | Difference |
| DAC | 0.1459 | _0.1881_ | 0.1476 | _0.1637_ | 0.1441 | _0.2104_ | 0.0035 |
| SHARE | 0.5000 | _0.5012_ | 1.0000 | _0.0000_ | 0.0000 | _0.0000_ | 1.0000 |
| BIG4P | 0.6697 | _0.4714_ | 0.7064 | _0.4575_ | 0.6330 | _0.4842_ | 0.0734 |
| BIG4C | 0.2248 | _0.4184_ | 0.4495 | _0.4997_ | NA | _NA_ | NA |
| SIZE | 6.0354 | _2.1208_ | 6.4065 | _2.0858_ | 5.6643 | _2.0997_ | 0.7423*** |
| GROWTH | 0.4296 | _3.3825_ | 0.2365 | _1.1143_ | 0.6227 | _4.6552_ | -0.3863 |
| LOSS | 0.3670 | _0.4831_ | 0.3670 | _0.4842_ | 0.3670 | _0.4842_ | 0.0000 |
| MERGE | 0.0003 | _0.0081_ | 0.0001 | _0.0025_ | 0.0005 | _0.0111_ | -0.0004 |
| RESTRUCT | -0.0024 | _0.0118_ | -0.0035 | _0.0160_ | -0.0013 | _0.0046_ | -0.0022* |

DAC = the absolute value of discretionary accruals calculated in equation 11 SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

GROWTH = the change in revenue from prior year scaled by lagged total assets;

LOSS = a dichotomous variable coded 1 if the company had a loss and 0 otherwise;

MERGE = acquisition and merger items divided by total assets;

RESTRUCT = restructuring items divided by total assets.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

**Table 17 - Descriptive Statistics and Univariate Tests – Fee Analysis**

| | Full sample | | Test sample | | Control sample | | |
|---|---|---|---|---|---|---|---|
| | Mean | *SD* | Mean | *SD* | Mean | *SD* | Difference |
| FEE | 13.6733 | *1.4400* | 13.6629 | *1.4494* | 13.6837 | *1.4381* | -0.0208 |
| SHARE | 0.5000 | *0.5013* | 1.0000 | *0.0000* | 0.0000 | *0.0000* | 1.0000 |
| BIG4P | 0.7021 | *0.4585* | 0.7234 | *0.4497* | 0.6809 | *0.4686* | 0.0426 |
| BIG4C | 0.2394 | *0.4278* | 0.4787 | *0.5022* | NA | *NA* | NA |
| SIZE | 6.3917 | *2.1407* | 6.4085 | *2.1610* | 6.3748 | *2.1316* | 0.0337 |
| LEV | 0.6226 | *0.4570* | 0.7141 | *0.5212* | 0.5311 | *0.3623* | 0.1829*** |
| INVREC | 0.2891 | *0.2231* | 0.2850 | *0.2260* | 0.2932 | *0.2213* | -0.0081 |
| ROA | -0.0499 | *0.2520* | -0.0650 | *0.2509* | -0.0348 | *0.2536* | -0.0302 |
| LOSS | 0.3617 | *0.4818* | 0.3617 | *0.4831* | 0.3617 | *0.4831* | 0.0000 |
| NEWAUD | 0.0798 | *0.2717* | 0.1064 | *0.3100* | 0.0532 | *0.2256* | 0.0532* |

FEE = natural logarithm of audit fee;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

LEV = total liabilities divided by total assets;

INVREC = inventories plus receivables divided by total assets;

ROA = net income divided by total assets;

NEWAUD = a dichotomous variable coded 1 if this is the initial audit engagement, 0 otherwise.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

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**Table 18 - Correlation Matrix - Quality Analysis**

| | DAC | SHARE | BIG4P | BIG4C | SIZE | GROWTH | LOSS |
|---|---|---|---|---|---|---|---|
| DAC | 1.0000 | | | | | | |
| SHARE | 0.0094 | 1.0000 | | | | | |
| | 0.8903 | | | | | | |
| BIG4P | -0.2247 | 0.0780 | 1.0000 | | | | |
| | **0.0008** | 0.2513 | | | | | |
| BIG4C | -0.0860 | 0.5385 | 0.1445 | 1.0000 | | | |
| | 0.2061 | 0.0000 | **0.0330** | | | | |
| SIZE | -0.3768 | 0.1754 | 0.5442 | 0.3707 | 1.0000 | | |
| | **0.0000** | 0.0095 | **0.0000** | **0.0000** | | | |
| GROWTH | 0.0685 | -0.0572 | -0.1524 | -0.0549 | -0.1424 | 1.0000 | |
| | 0.3137 | 0.4004 | **0.0245** | 0.4202 | **0.0356** | | |
| LOSS | 0.1045 | 0.0000 | -0.1938 | 0.0232 | -0.3793 | 0.0709 | 1.0000 |
| | 0.1238 | 1.0000 | **0.0041** | 0.7332 | **0.0000** | 0.2971 | |
| MERGE | 0.4914 | -0.0226 | -0.1136 | -0.0264 | -0.1078 | 0.1369 | -0.0761 |
| | **0.0000** | 0.7398 | 0.0942 | 0.6978 | 0.1125 | **0.0435** | 0.2630 |
| RESTRUCT | -0.0002 | -0.0941 | -0.0675 | -0.1204 | 0.0150 | 0.0247 | -0.1735 |
| | 0.9974 | 0.1662 | 0.3209 | 0.0760 | 0.8252 | 0.7166 | **0.0103** |

| | MERGE | RESTRUCT |
|---|---|---|
| MERGE | 1.0000 | |
| RESTRUCT | 0.0199 | 1.0000 |
| | 0.7697 | |

DAC = the absolute value of discretionary accruals calculated in equation 11;
SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;
SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;
BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;
BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;
SIZE = the natural logarithm of total assets;
GROWTH = the change in revenue from prior year scaled by lagged total assets;
LOSS = a dichotomous variable coded 1 if the company had a loss and 0 otherwise;
MERGE = acquisition and merger items divided by total assets;
RESTRUCT = restructuring items divided by total assets.

**Table 19 - Table Correlation Matrix - Fee Analysis**

|        | FEE     | SHARE   | BIG4P   | BIG4C   | SIZE    | LEV     | INVREC  |
|--------|---------|---------|---------|---------|---------|---------|---------|
| FEE    | 1.0000  |         |         |         |         |         |         |
| SHARE  | -0.0072 | 1.0000  |         |         |         |         |         |
| BIG4P  | 0.5201  | 0.0465  | 1.0000  |         |         |         |         |
| BIG4C  | 0.2723  | 0.5610  | 0.1201  | 1.0000  |         |         |         |
| SIZE   | 0.8769  | 0.0079  | 0.5369  | 0.2841  | 1.0000  |         |         |
| LEV    | 0.0367  | 0.2007  | -0.0925 | 0.2272  | -0.0652 | 1.0000  |         |
| INVREC | 0.1634  | -0.0183 | 0.0566  | -0.1772 | 0.0451  | 0.0257  | 1.0000  |
| ROA    | 0.4402  | -0.0601 | 0.3616  | -0.0378 | 0.5291  | -0.4821 | 0.2798  |
| LOSS   | -0.3489 | 0.0000  | -0.2117 | 0.0707  | -0.3963 | 0.2065  | -0.2307 |
| NEWAUD | -0.0864 | 0.0982  | -0.2375 | -0.0272 | -0.0227 | -0.0715 | -0.1002 |

|        | ROA     | LOSS    | NEWAUD  |
|--------|---------|---------|---------|
| ROA    | 1.0000  |         |         |
| LOSS   | -0.5954 | 1.0000  |         |
| NEWAUD | -0.0413 | 0.0235  | 1.0000  |

FEE = natural logarithm of audit fee;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

LEV = total liabilities divided by total assets;

INVREC = inventories plus receivables divided by total assets;

ROA = net income divided by total assets;

NEWAUD = a dichotomous variable coded 1 if this is the initial audit engagement, 0 otherwise.

**Table 20 - Multivariate Results – Quality Analysis**

| Variable  | Expected Sign | Coeff.  | t-value   |
|-----------|---------------|---------|-----------|
| Intercept | ?             | 0.3077  | 0.00      |
| SHARE     | +             | 0.0528  | 2.06**    |
| BIG4      | -             | 0.0099  | 0.23      |
| BIG4C     | -             | -0.0525 | -1.50     |
| SIZE      | -             | -0.0281 | -2.25**   |
| GROWTH    | +             | 0.0022  | 1.14      |

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| | | | |
|---|---|---|---|
| LOSS | + | -0.0228 | -1.15 |
| MERGE | + | 10.6625 | 6.14*** |
| RESTRUCT | + | 0.3732 | 0.46 |
| | | | |
| R-squared | 0.4859 | | |

DAC = the absolute value of discretionary accruals calculated in equation 11;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

GROWTH = the change in revenue from prior year scaled by lagged total assets;

LOSS = a dichotomous variable coded 1 if the company had a loss and 0 otherwise;

MERGE = acquisition and merger items divided by total assets;

RESTRUCT = restructuring items divided by total assets.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

**Table 21 - Multivariate Results – Fee Analysis**

| Variable | Expected Sign | Coeff. | t-value |
|----------|---------------|--------|---------|
| Intercept | ? | | |
| SHARE | - | -0.1894 | -1.75* |
| BIG4P | + | 0.2962 | 2.38** |
| BIG4C | + | 0.2219 | 1.36 |
| SIZE | + | 0.5307 | 9.73*** |
| LEV | + | 0.1397 | 1.33 |
| INVREC | + | 1.0886 | 3.47*** |
| ROA | - | -0.6979 | -2.2** |
| LOSS | + | -0.0733 | -0.77 |
| NEWAUD | - | -0.1117 | -0.87 |
| | | | |
| R-squared | 0.9256 | | |

FEE = natural logarithm of audit fee;

SHARE = a dichotomous variable coded 1 if the observations represents a company whose audit opinion had a reference to another auditor and 0 otherwise;

BIG4P = a dichotomous variable coded 1 if the principal auditor was a Big 4 firm, and 0 otherwise;

BIG4C = a dichotomous variable coded 1 if the component auditor was a Big 4 firm, and 0 otherwise;

SIZE = the natural logarithm of total assets;

LEV = total liabilities divided by total assets;

INVREC = inventories plus receivables divided by total assets;

ROA = net income divided by total assets;

NEWAUD = a dichotomous variable coded 1 if this is the initial audit engagement, 0 otherwise.

\*\*\*, \*\*, \* - Indicates significance at the 1%, 5% and 10% levels respectively in a two-tailed test.

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