TWO ESSAYS ON AUDIT FIRM DIFFERENTIATION

APPROVED BY SUPERVISING COMMITTEE:

____
Jeffery P. Boone, Ph.D., Chair

____
Sharad Asthana, Ph.D.

____
Emeka T. Nwaeze, Ph.D.

____
Marshall K. Pitman, Ph.D.

____
Donald Lien, Ph.D.

Accepted: ____
Dean, Graduate School

DEDICATION

1. To all who strive for Knowledge:

"Tell whoever claims the Philosophy of Knowledge,
You might have learned something, but you have a many things yet to learn."

Abu Nawas – Arab Poet (762-813)

2. To all who strive for Freedom:

"When the people will to live,
Destiny must surely respond.
Oppression shall then vanish.
Fetters are certain to break."

Abul Kacem Chebbi – Tunisian Poet (1909-1934)

TWO ESSAYS ON AUDIT FIRM DIFFERENTIATION

by

WAEL AGUIR, M.S.A.

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TWO ESSAYS ON AUDIT FIRM DIFFERENTIATION

Wael Aguir, Ph.D.
The University of Texas at San Antonio, 2011

Supervising Professor: Jeffery P. Boone, Ph.D.

This dissertation examines strategies undertaken by accounting firms to differentiate their auditing services. It consists of two essays. In the first essay, I investigate audit firm reputation as a differentiation strategy. In particular, I examine whether audit firm reputation has an effect on the perceived credibility of financial reports. I add to the debate on the topic by devising a new, direct measure for auditor reputation change. I then use this measure in empirical tests using a valuation model and a cost of capital test.

In the second essay, I examine industry specialization as a strategy some accounting firms undertake to differentiate their services. Specifically, I investigate whether audit firms market their industry expertise to client companies with high levels of accrual intensity.

The main findings of the dissertation are summarized as follows. In the first essay, I find modest confirmation that auditor reputation changes are positively associated with changes in earnings response coefficients. On the other hand, the cost of capital analysis provides a stronger insight into the question, as findings suggest that client firms with higher reputation change score overall enjoy lower cost of equity capital.

The results from the second essay provide evidence that client firms with high levels of accruals are less likely to be audited by industry specialist accounting firms. One possible explanation can be that these firms are regarded as riskier for auditors who prefer to avoid

problems that might arise in the course of their audit and that might spoil their industry specialization differentiation strategy.

In sum, I find that some audit firms do undertake differentiation strategies to stand out in a competitive auditing market. I find that auditor reputation has a positive effect on the credibility of client firms' financial statements, and that it is associated with lower cost of capital. I also find that audit firms that specialize in particular industries try to avoid risky engagements that would undermine their differentiation strategies.

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CHAPTER ONE: INTRODUCTION

Overall Organization of this Dissertation

This dissertation is organized into two separate essays structured around a main theme: the supply of, and the demand for, differentiated audit services. In terms of Porter's (1985)[1] analysis of differentiation strategy, an audit firm may elect to differentiate itself from the competition in order to attract clients and generate a fee premium. An audit firm implements such a strategy by sustaining and promoting unique dimensions that are important and valuable to client firms and other stakeholders. Chapters two and three analyze audit firm reputation and audit firm industry expertise, respectively, as differentiation strategies many audit firms choose to implement. Chapter four summarizes the main findings of the dissertation and presents areas of future research.

Summary of chapter Two

The first essay is presented in chapter two. The essay investigates auditor reputation as a dimension along which audit services are differentiated. In this study, I specifically examine the effect of auditor reputation on the perceived credibility of financial statements. I hypothesize that changes in auditor reputation are associated with investors' valuation of accounting earnings and ex ante cost of equity. These hypotheses are not novel, and have been tested in prior studies. My contribution lies in developing a new, direct measure of auditor reputation change that permits a more refined test of auditor reputation effects.

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[1] Porter, M. E., *Competitive Advantage*. 1985, New York: The Free Press.

I develop a reputation change score that measures the change in auditor reputation based on the content analysis of news reports citing auditors. I classify the words contained in the news reports according to their positive, negative, or neutral connotation, as defined by the Loughran and McDonald (2011) Financial Sentiment Dictionary. I then use the Janis-Fadner model to measure auditors reputation change scores.

I use this score to test two hypotheses related to financial statement credibility. In the first hypothesis, I consider the earnings response coefficient (ERC) as a measure for investors' perceptions of a company's financial statements' credibility. Thus, I examine whether the change in the earnings response coefficient is associated with the auditor reputation change score.

Investors' perceptions of financial statements credibility has also been assessed from a cost of equity capital perspective (e.g. Khurana and Raman 2004 and Khurana and Raman 2006). Thus, I supplement my valuation analysis with a cost of equity capital analysis. In the second hypothesis, I predict that client firms with higher reputation change scores experience a decrease in ex-ante cost of equity capital.

The results presented in chapter two are overall consistent with theoretical predictions. For the ERC tests, the change in reputation score is positively but marginally associated with the change in ERC. The cost of equity capital test shows that as auditor reputation increases, client firms' cost of capital decreases. The association between the change in reputation score and the cost of equity capital is statistically and economically significant. The results from this analysis are consistent with the second hypothesis.

Summary of Chapter Three

The second essay is presented in chapter two. The essay examines auditor industry specialization as another dimension of audit services differentiation. In particular, I investigate whether client firm's accrual intensity is associated with the selection of an industry specialist auditor. The hypothesis that accrual intensity is related to choice of an industry specialist is new to the literature.

The results in chapter three suggest that accrual intensity is negatively associated with the choice of an industry-specialist auditor. In other words, companies with high levels of accruals tend to be audited by auditors that are not industry specialists. This result is consistent with the audit risk hypothesis, that auditors perceive clients with high accrual intensity as more likely to pose a threat to their industry reputation.

Collectively, these two essays offer new insights into the broad issue of the supply of and demand for differentiated audit services. Below, I present the two essays.

CHAPTER TWO: AUDITOR REPUTATION AND FINANCIAL STATEMENTS CREDIBILITY

1. Introduction.

Auditors express an opinion regarding the fairness of information contained in the financial statements, thereby increasing the credibility of these reports (Watts and Zimmerman 1986). Prior research (e.g. DeAngelo 1981, Balsam et al. 2003; Krishnan et al. 2005) suggests that investors value some traits related to auditors, such as their competence and independence. Arguably, auditors known for quality work and independence are perceived as providing a higher level of assurance to investors. As such, the financial statements they audit are regarded as more credible and reliable. Prior research (e.g. Beatty 1989; Teoh and Wong 1993; Moreland 1995; Chaney and Philippich 2002; Asthana et al. 2008) suggests that the market is particularly sensitive to auditor reputation.

The purpose of this study is to examine the effect of auditor reputation on the perceived credibility of financial statements using a *direct measure* of the change in auditor reputation. There have been calls to refine the auditor reputation measure (e.g. Beatty 1989 and Watkins et al. 2004). Yet, most of the prior research that investigates this effect relies on indirect reputation indicators. These more readily available indicators (most commonly a Big N/not-Big N auditor size indicator and an audit failure event indicator) are vulnerable to a number of known weaknesses. Particularly, studies using the Big N/non Big N indicator measure are vulnerable to potential self-selection bias effects. On the other hand, the conclusions of studies examining audit failure events are vulnerable to internal as well as external validity issues.

I suggest a measure of change in auditor reputation that is less vulnerable to these weaknesses. Specifically, I analyze the content of news articles identifying auditors. Based on the ratios of positive and negative words contained in these articles, I construct a variable measuring the change in auditors' reputation. I then use this variable to test whether auditor reputation has an effect on the perceived credibility of financial reports. This measure of change in auditor reputation is more robust to the threats indicated above, and, thus, it allows for stronger tests of auditor reputation effects in capital markets. I use this variable to examine auditor reputation effects on the credibility of financial statement from an investor's perspective.

Financial statements' credibility is supposed to reduce agency costs by reducing the information asymmetry between the managers and the shareholders (Jensen and Meckling 1976). In addition to information asymmetry, credibility reduces investors' uncertainty about the content of the financial reports (Wilson and Grimlund 1990). Arguably, the high level of assurance provided by credible financial reports translates into high earnings quality and low ex ante cost of equity capital (Slovin et al. 1990, Khurana and Raman 2004; Ahmed et al. 2008). Following this argument, I use the earnings response coefficient and the client-specific ex ante cost of equity capital as proxies for the credibility of financial reports. Prior literature (e.g. Teoh and Wong 1993, Balsam et al 2003; Khurana and Raman 2004) discusses the effects of auditor reputation on financial statements' credibility. In particular, these studies examine the association between auditor reputation and investors' perceptions as reflected in earnings response coefficients (ERCs) and ex ante equity risk premiums. Consistent with prior research, I use the proposed change in reputation measure to investigate the association between auditor reputation and earnings response coefficients on one hand, and auditor reputation and the ex ante equity risk premiums on the other. By revisiting the findings of prior research using this refined measure of the change in auditor reputation, the present study probes the robustness of prior published findings and lends insight into the appropriateness of the commonly-used and more easily measured Big N/non Big N proxy for auditor reputation.

I find that while ERC tests are weak, the ex ante equity risk premium tests show that an increase in auditor reputation, as measured using the reputation change score, is associated with a decrease in cost of capital. This decrease is statistically as well as economically significant. Further investigation shows that these results hold even after controlling for auditor designation as Big 4 firms. That is, I find that an increase in auditor reputation is associated with a decrease in cost of equity capital for client firms *within* the Big 4 auditors group.

The present study contributes to the auditor reputation literature by developing a direct measure of the change in auditor reputation. This new measure presents several appealing advantages. For instance, it facilitates a research design that is less vulnerable to the shortcomings of prior measures discussed above. It also allows for more variability across auditors and time. Overall, the richness of information in the new change in reputation measure would allow a better understanding the effects of auditor reputation.

This paper unfolds as follows. Section 2 discusses relevant literature and presents the hypotheses. Section 3 discusses the methodology to be used to address the research questions. Empirical findings will be presented in section 4, and section 5 concludes the paper.

2. Auditor reputation

2.1. The concept of auditor reputation

The concept of reputation has been widely discussed within the organizational behavior literature, yet for a long time the literature has not coalesced around a precise and commonly understood definition (Fombrun and Van Riel 1997, Helm 2005, Barnett et al. 2006). Barnett et al. (2006) examine the organizational behavior literature and suggest that corporate reputation can be viewed as the observers' collective judgments of a firm.

Barnett et al. (2006) survey the corporate reputation literature and differentiate their definition of reputation from three other common broad ways of viewing the concept of reputation: reputation as identity, reputation as image, and reputation as capital. Corporate reputation as identity corresponds to what the company actually is. It reflects the underlying "core" or basic character of the firm. Corporate identity consists of a collection of symbols and features: features that insiders consider central to the firm, features that distinct the firm from other firms, and features that are enduring or continuing (i.e. the history of the firm). Reputation as image corresponds to the perceptions and representations of an organization. Corporate image relates to the impressions of the firm's collection of symbols (identity). A firm's image can be affected by public relations and marketing activities, and is also function of other factors such as media, regulation, and competition (Barnett et al. 2006). Finally, the authors distinguish between reputation and reputation capital. Reputation as reputational capital corresponds to the economic and intangible value attributed to a firm's reputation. Barnett et al. (2006, p. 34) note that "as judgments of the firm accumulate over time, reputation capital ebbs and flows".

The same views of audit firm reputation are present in the audit literature. One ubiquitous view sees auditor reputation through its size and the extent of its international network (e.g. Healy and Lys 1986). This view is consistent with the reputation as an identity. The audit firm is either one of the N largest firms or is not. The same reasoning extends to auditors that specialize in certain industries. This classification does not rely on impressions or judgments. Another common view of audit firm reputation is the degree to which a firm is nationally and internationally known (Beatty 1989). This view is consistent with the reputation as image. A third widely held view sees auditor reputation as an economic asset that provides collateral bond to ensure auditor independence (e.g. Watts and Zimmerman 1986, Wilson and Grimlund, 1990). This view is consistent with considering reputation as capital. Audit firms build their reputation capital through a track record for discovering and reporting breaches (Watts and Zimmerman 1986). Finally, Watkins et al. (2004) view auditor reputation as the users' beliefs about the competence and the independence of the auditor. This view is consistent with considering auditor reputation as observers' judgments.

Watkins et al. (2004) also point out that empirical studies adopting a reputation-as-an-identity view or a reputation-as-an-image view of auditor reputation (i.e., those relying upon a Big N or industry-specialist dummy) misidentify audit quality and reputation. This confusion is due to research findings suggesting that large audit firms and firms that specialize by industry also appear to deliver high audit quality. In this sense, reputation-as-judgment appears to be a more precise means of portraying auditor reputation than the other views. On another note, Barnett et al. (2006) argue that the reputation-as-judgment is more promising for future research because (1) it represents middle ground between everyday language and highly technical language, and (2) most available definitions use language of assessment and awareness to define corporate reputation.

The concept of reputation discussed by Watkins et al. (2004) and refined by Barnett et al, (2006) has several appealing properties for the present analysis. Reputation-as-judgment permits an expression of reputation in terms of every-day judgment investors, stakeholders, and the public render about an audit firm. In addition, reputation-as-judgment abstracts from a highly technical point of reference toward a contextually rich and operational concept. In view of these advantages, I define auditor reputation as the collective judgments made by observers about an audit firm.

2.2. Prior tests of Auditor reputation effects on financial statements credibility.

Prior studies investigating auditor reputation effects are based either on cross-sectional analyses or event analyses. The cross-sectional analyses associate a proxy for auditor reputation to investor perceptions or client perceptions. The event analyses examine the revision in investor perceptions/client perceptions coincident with events that signal a loss in auditor reputation or a change to an auditor with a different level of reputation.

2.2.1. Cross-sectional studies.

Cross-sectional studies investigating auditor reputation effects have operationalized "auditor reputation" in two ways. The most common operational definition is a Big N dummy variable (=1 if the audit firm is a Big N auditor; 0 otherwise). This operational definition is premised on the idea that Big N auditors (relative to non Big N auditors) invest heavily in auditor training, and have greater incentive and ability to resist client pressure. The second most common operational definition is an industry specialist dummy variable (=1 if the audit firm is an industry specialist; 0 otherwise). This operational definition is premised on the idea that auditor specialization is observable and that industry specialists (as compared to non-specialists) are perceived to understand the client's business and audit risks better (e.g. Ahmed et al. 2008).

Consistent with these conjectures, the extant research shows that Big N auditors and industry specialists are associated with proxies for *actual* audit quality. Researchers explain that based on this line of logic, investors should view Big N auditors and industry specialists as more reputable than other audit firms. They test the hypothesis that higher financial statements credibility reflects higher auditor reputation (as depicted through size or specialization).

Auditor reputation is particularly important to investors when financial statements uncertainty is high. For example, when a client firm issues shares for the first time, investors look to the reputation of the auditor as an indicator of the credibility of the information disclosed. Good auditor reputation can, thus, reduce financial statements' uncertainty. Under this premise, Titman and Trueman (1986) demonstrate that a client's choice of an audit firm is used by investors to value new issues. They show that choosing an auditor known for high quality standards translates into a more favorable perception of information and higher issue price. Balvers et al. (1988) use the same arguments to develop a model suggesting that auditor reputation has an effect on the underpricing of the new issue. They illustrate the validity of their analytical propositions using an empirical investigation. The study suggests that auditor reputation has a negative effect on underpricing. The authors explain that auditor reputation plays two important roles in the information environment: a reduction of perceived uncertainty associated with earnings and a signal to the investors about the quality of the underwriting coalition with the investment banker. In the same vein, Beatty (1989) examines whether auditor reputation affects the pricing of initial public offerings (IPOs). The author argues that auditors have incentives to examine a client's financial statement carefully and to report any deviation in the application of accounting standards. He explains that auditors spend a considerable amount of resources to develop a reputation capital in order to differentiate themselves. Any revelation of errors or misstatements in a client's financial statements quickly debase the auditor's reputational capital. The author finds that clients of more reputable auditors exhibit lower initial returns than clients of less reputable auditors. He suggests that because the highly reputable audit firms have greater incentives to reduce errors, the information provided in statements audited by them is more precise. This precision reduces uninformed investors' ex ante uncertainty and thus reduces the initial IPO return. Similar studies investigating the U.S. market corroborate these findings (Carter and Manaster 1990). Comparable results have been reproduced for the Canadian IPO market (Clarkson and Simunic 1994).

Other studies examine the ERC as an alternative measure of investors' perceptions of auditor reputation. For instance, Teoh and Wong (1993) examine whether investors perceive that using Big 8 auditors to sign off financial reports lends greater credibility to these reports. They advance that higher auditor reputation has a positive effect on ERCs as follows: the higher the auditor reputation the lower the noise in financial reports, and that the lower the noise the higher the ERCs (Holthausen and Verrecchia 1988). Since the financial reports certified by Big 8 auditors are perceived by investors to have a higher quality, ERCs are expected to be higher for Big 8 clients. Based on a matched-pair sample and a sample of clients that switched auditors, findings suggest indeed that ERC is significantly higher for clients of Big 8 auditors than for those of non Big 8.

More recently, Behn et al. (2008) suggest that brand name auditors are viewed as providing higher quality based on their *perceived* competence and independence. Although the authors do not explicitly discuss auditor reputation, their maintained assumption is consistent with the conceptual definition of auditor reputation as collective judgments made by observers about an audit firm. The authors examine whether the use of such auditors is associated with the predictability of accounting earnings. Their results show that analysts' earnings forecast accuracy is higher and the forecast dispersion is smaller for clients of Big 5 audit firms. Since the reports examined by these auditors can be used to generate more accurate forecasts, market participants perceive the Big-5-certified reports as reflecting less uncertainty and more predictability, thus, more reliable.

Behn et al. (2008) extend their arguments to auditor industry expertise. They suggest that the perceived high quality of industry-expert auditors increases the reliability of financial reports because these auditors are believed to be effective at reducing both intentional and unintentional reporting errors. Findings from this study indicate that earnings forecasts for the clients of industry-specialized auditors are more accurate and less dispersed than those for the clients of non-industry specialist non Big 5 auditors.

Considering that auditor industry expertise is another observable attribute associated with auditor reputation, studies examining industry expertise can shed some light on the effect of auditor reputation on financial reporting credibility. For example, Balsam et al. (2003) examine whether industry specialization is associated with measures of earnings quality. They provide evidence that ERCs of firms audited by industry experts are higher than those of firms audited by non experts. In the same vein, Kwon et al. (2007) investigate the effect of auditor specialization on earnings informativeness in different legal environments. They use six measures of auditor industry expertise. Findings from their study indicate that auditor industry specialization is associated with higher ERCs only in two of the six specifications. In the remaining specifications, the effect of auditor expertise is not significant. The authors conclude that there is only weak evidence that earnings are more informative for firms audited by industry expert auditors.

On another note, Ahmed et al. (2008) investigate whether clients of industry expert auditors have a lower cost of equity capital than those of non industry experts. They find that the use of an industry specialist auditor significantly reduces firms' cost of capital by 10 to 20 basis points for firms with weak governance mechanisms. They also show that the use of an industry specialist auditor is associated with lower cost of debt.

Both Healy and Lys (1986) and Johnson and Lys (1990) contend that monitoring by a reputable auditor improves potential investors' perceptions about the credibility of client disclosures, lowering the cost of new capital. Khurana and Raman (2004) explicate that to the extent that investors perceive the auditor as providing higher quality audits and more credible financial statements, firms audited by such auditors would enjoy a lower ex ante cost of equity capital. They examine this proposition in the US and in less litigious countries during 1990 to 1999. They find that using a higher quality auditor, as regarded by investors, is associated with a lower ex ante cost of equity capital in the US, but not in Australia, Canada, or the UK. Their findings provide support for the proposition that perceived audit quality is driven by litigation exposure rather than brand name reputation protection.

Overall, studies that consider observable variables judged by investors as indicators of higher reputation such as size and industry expertise provide evidence that higher auditor reputation is associated with higher financial statements credibility. Investors appear to have a stronger reaction to earnings surprises if the financial reports are certified by reputable auditors, and client firms who employ these auditors appear to benefit from a lower ex ante cost of equity capital.

2.2.2. Event studies.

Other studies examine auditor reputation effects by structuring tests around two broad class of events: (1) events that signal a loss in auditor reputation due to revelation of an audit failure or (2) auditor change events, where a firm changes to an auditor with a different (either a higher or a lower) level of reputation[2].

The demise of Arthur Andersen (AA), then one of the Big 5 audit firms, is acknowledged as a consequence of failed auditing. A number of studies discuss this widely publicized event and concentrate on the reputation loss in the aftermath of the collapse of AA. Chaney and Philippich (2002) examine the effect of a loss of auditor reputation on investors' perceptions about other AA auditees' financial statements reliability. They show that AA's clients suffered from a negative market reaction to the audit firm's admission to documents shredding. They also show that the clients of the Houston office suffered the largest negative abnormal returns. These findings provide evidence that when an auditor's reputation is damaged, investors question the credibility of that auditors' work, and this uncertainty is, therefore, reflected in stock prices.

Krishnamurthy et al. (2006) extend these findings and provide evidence that auditor reputation is a more sensitive issue if auditor independence is believed to be impaired. They also show that when firms quickly dismissed AA, the announcement returns were higher for clients that switched to Big 4 auditor than to a less reputable auditor. The authors conclude that reputation damage taints the perceived reliability of financial statement information and that this is more of an issue where auditor independence is perceived as more likely impaired.

However, there does not appear to be a consensus over the reputation effect of the demise of AA. As a matter of fact, Nelson et al. (2008) reexamine Chaney and Philippich (2002) claim that it was AA's shredded reputation that cost its clients in market value. The authors retrace the chronology of the scandal and provide evidence that confounding effects may have caused the price decline. They document that the negative abnormal returns displayed by the auditor's

[2] For example, "upgrading" to a higher auditor reputation level, by changing from a non Big N auditor to a Big N auditor, or changing from a non-industry specialist to an industry specialist auditor.

clients were heavily driven by client firms in the energy sector. They show that sharp decline in oil prices and the particular decomposition of the auditor's portfolio (largely composed of energy industry-related firms) were behind the negative market reaction.

While these studies focus on AA's collapse, other studies report and investigate similar audit failures throughout the world. Weber et al. (2008) study the effect of auditor reputation in a less litigious market than the U.S. market. They investigate stock and audit market effects of an audit failure related to KPMG in Germany, a country with a less severe litigation environment than the US. Findings reveal negative abnormal returns of about 3% at events coinciding with the scandal. The authors also report an increased number of clients dropping KPMG as their auditor in the year the failure was discovered. The authors demonstrate that contrary to the conclusion suggested by Khurana and Raman (2004), it is the reputation rationale that ensures audit quality, rather than the insurance rationale.

On another note, Asthana et al. (2009) investigate the market reaction to events around the collapse in 2001 of Zhongtianqin (ZTQ), the largest Chinese auditor. The authors show that while the whole market reacted to the audit failure, ZTQ's clients suffered from a worse decline in stock prices than clients of other auditors. They emphasize that these results are important because they show market reaction even though the Chinese market is relatively young and operates under weaker law enforcement than the American counterpart.

Skinner and Srinivasan (2009) investigate the failure of ChuoAoyama, the Japanese PwC affiliate. The market reaction tests of the events under scrutiny do not seem to provide evidence that the auditor's clients suffered any declines in stock prices as the events unfolded. In contrast, Sakuma (2009) find an overall negative market reaction of clients of the same auditor and other

Big 4 auditors around September 13th, 2005 (the date the auditor was arrested) and October 3rd, 2005 (the date the auditor was criminally indicted).

The gist of the auditor failures anecdotes is that auditor reputation is valued by investors, and that tainted reputation is sanctioned by the market. While the evidence presented in these studies is key to our understanding of the effects of audit reputation on the credibility of financial statements, the scope of these studies is limited to particular events. As demonstrated by Nelson et al. (2008), it is hard to infer a direct association between a particular event and contemporaneous market reactions due to potential confounding effects. Studies of aggregate audit failures and their disclosure to the market can shed more light on whether tainted auditor reputation is picked up by investors. These studies examine whether client firms suffer a decline in market value after the publication of criticisms to their auditors.

Firth (1990) examines whether criticisms of an auditor's work by the U.K. Department of Trade under the Companies Act of 1948 impact that auditor's reputation. Criticisms may be issued for lack of independence, insufficient audit work, insufficient support from senior partners, or insufficient work done on prospectuses by auditors. The results indicate that in the week of criticism report publication, clients of the criticized auditor suffer significantly negative average abnormal returns.

Similarly, Moreland (1995) contends that auditor sanctions degrade estimated audit quality and reduces the perceived credibility of client earnings numbers, which in turn reduces ERCs for client firms. The author examines this hypothesis in the case of SEC actions against the client firm and its auditor reported in the Accounting and Auditing Enforcement Releases (AAERs). These reports are made public; they describe the wrongdoing of the client firm and the auditor, announce the penalties imposed, and disclose the recommended remedial actions[3]. Moreland (1995) finds that SEC criticisms are associated with a weaker association between earnings are returns (ERCs) for client firms of auditors subject to the enforcement actions.

More recently, Gunny and Zhang (2006) investigate the earnings quality of negative reports as a consequence of PCAOB inspections. They find that earnings association with one-period lead cash flows is significantly lower for clients of audit firms receiving a negative opinion.

In short, prior studies seem to concur that proxies for auditor reputation are associated with the reliability and the credibility of financial statements. However, one cannot rule out the possibility that large firms with higher quality financial reporting self select into larger audit firms. Also, exogenous events characterized as audit failures might be associated with loss in audit firm market share and clients' stock price declines. Concordantly, one is not able to trace these negative effects to the loss of auditor reputation or a loss of the auditor's implicit insurance.

Auditor change literature provides some insights on the investors' response to switches between auditors of different caliber. For instance, Johnson and Lys (1990) report that clients that switch to a Big 8 (non Big 8) audit firm realize significant positive (negative) abnormal returns over the sixty day preceding the switch. Similarly, Knechel et al. (2007) investigate the market response to auditor switches and show that client firms that switch from a non Big 4 auditor to a Big 4 auditor experience a significant 3.4% cumulative abnormal returns (CAR), while firms that make to inverse switch incur a significant loss (-3.5%) in CAR. In the same study, the authors also investigate investors' reaction to client firms changing to and from

[3] Prior to 1982, the SEC actions were reported in Accounting Series Releases (ASRs).

industry specialist auditors. They find that client firms switching between Big 4 auditors display significant positive abnormal returns when the successor auditor is an industry specialist, and they experience significant negative abnormal returns when the successor auditor is not a specialist.

Reporting on the Enron scandal, Barton (2005) studies the timing of clients breaking away from their auditor AA. The author finds that clients that are more visible in the capital market tend to interrupt the relationship sooner than clients that are less visible. She concludes that more visible clients are more concerned about the reputation of their auditor, and that those clients' own financial reporting credibility is highly linked to their auditor's reputation. Asthana et al. (2008) extend these findings and show that clients with low switching costs and strong governance, and clients who suffered significant market losses when the scandal erupted were quicker to change auditors because of the incentives associated with the switch, and the disincentives to stay with the auditor.

2.2.3. Limitation of the existing studies and motivation for a new change in reputation measure.

The previously discussed cross-sectional studies provide consistent evidence that Big N auditors and industry specialists are associated with lower ex ante risk premiums and larger earnings response coefficients. However, these studies are subject to at least two important limitations.

First, the studies rely upon Big N and industry dummy variables as proxies for auditor reputation, and, therefore, are vulnerable to self-selection bias. Auditees are not randomly assigned to either a Big N or non Big N auditor, nor are they randomly assigned to industry specialists. Rather, auditees self-select their own auditor based upon factors that are not always observable to the researcher. In addition to the risk of self-selection bias, these studies risk confounding reputation effects with insurance effects since the greater economic resources of Big N auditors (compared to non Big N auditors) provide investors relatively greater insurance against audit failure (i.e., audit firm economic resources are subject to judgment in the event of a securities litigation following an audit failure, representing a form of insurance against audit failure). Thus, it is possible that the results documented in prior studies are attributable to the unobservable factors driving the auditor choice or insurance effects rather than the reputation of the auditor.

The previously discussed event studies provide consistent evidence that auditor upgrade/downgrade change events or events signaling loss of auditor reputation are associated with stock price declines and audit fee changes. Both sets of studies are subject to their own important limitations.

The auditor upgrade/downgrade investor perspective event studies are limited because investors may be responding to the underlying conditions that trigger the auditor change rather than the change in the auditor per se. For example, a firm may change from a non Big N auditor to a Big N auditor because the firm anticipates expanding its scope of operations into a geographic area not serviced by its former non Big N auditor, and the resulting increase in stock price occurs because investors respond favorably to the geographic expansion rather than the upgrade to a higher class auditor. The auditor upgrade/downgrade client perspective event studies are limited for similar reasons (i.e., the event triggering the auditor change may be the cause of the change in stock prices rather than the reputation of the new auditor).

Studies examining events that signal loss of auditor reputation are vulnerable to contemporaneous unrelated events that happen to coincide with the event of interest. Indeed, Nelson et al. (2008) provides evidence suggesting that studies investigating the Arthur Andersen event were adversely impacted by an unrelated event (a sharp decline in oil prices) that differentially impacted Andersen's clients.

In summary, efforts to investigate auditor reputation effects are impeded by the lack of a reliable proxy for auditor reputation, and this has compelled researchers to rely on coarse proxies or to structure tests around audit change/audit failure events. This dissertation develops a new proxy for the change in auditor reputation that is less vulnerable to the problems that plague empirical proxies of the construct in prior studies. Below, I discuss the estimation procedure for the proposed change in reputation proxy.

2.3. A new measure of the change in auditor reputation.

As noted earlier, my synthesis of Barnett et al. (2006) and Watkins et al. (2004) describes auditor reputation as the collective judgments made by observers about an audit firm. An empirical measure of auditor reputation from such a standpoint requires measures of both the extent of awareness of the audit firm as well as the evaluative judgment that attaches to that awareness.

This study proposes the use of content analysis of articles in the business press about an auditor to measure the awareness of, and judgment about that auditor[4]. I operationalize this measure as described below.

One important note about the measurement methodology described hereafter is that while it subsumes the conceptual definition of reputation discussed above, it more precisely depicts a

[4] Content analysis of news reports and company disclosures has been used in early accounting literature (e.g. Frazier et al. 1984). It has recently been revived in capital markets research (e.g. Tetlock 2007, Tetlock et al. 2008, Kothari et al. 2009, and Loughran and McDonald 2011). The same methodology has also been used in the executive compensation stream of the accounting literature (e.g. Core et al. 2008).

measure of the *change* in reputation. While ideally it would be better to directly measure a *stock* of reputation, doing that using the methodology discussed herein requires collecting all the news articles since the inception of all sampled audit firms. It also requires adjusting for the effect of audit firms' mergers and acquisitions throughout their existence. This task is beyond the scope of this paper. Therefore, in this paper I actually measure the *change* in auditor reputation. This measure of change reputation described in the next few paragraphs is based on collecting news reports published within a defined period of time. By construction, this metric, which I denote *REPCS*, is a reputation change score for a given period. This score measures the change in reputation between the beginning of a period and the end of it.

For a sample of audit firms, I collect from Lexis-Nexis all news reports published between January 2003 and December 2009 that contain variations on the audit firm name (e.g., "Ernst and Young", "EY" and "E&Y"). I read each news report to eliminate any potentially irrelevant catches, such as those that have "EY" stand for "End-of-Year" for example. I then classify the words in each news report according to whether they have a positive or negative connotation as defined by the Loughrand and McDonald (2011) Financial Sentiment Dictionary. This classification is done electronically using the software package SAS, which also produces for each document a count of the number of positive words, number of negative words, and the number of neutral (but relevant) words. These counts are denoted as POS_{dit}, NEG_{dit}, and NEU_{dit}, where the subscripts *d*, *i*, and *t* denote document, auditor, and time period, respectively.

As shown below, I sum the values POS_{dit}, NEG_{dit}, and NEU_{dit} across all documents for auditor *i* within time period t to develop the Janis-Fadner coefficient of imbalance, which serves as my change in reputation proxy, *REPCS*:

$$REPCS_{i,t} = \frac{\sum_d POS^2_{dit} - (\sum_d POS_{dit} \times \sum_d NEG_{dit})}{\sum_d NEU^2_{dit}} \qquad \text{if } \sum_d POS_{dit} > \sum_d NEG_{dit}$$

$$REPCS_{i,t} = \frac{(\sum_d POS_{dit} \times \sum_d NEG_{dit}) - \sum_d NEG^2_{dit}}{\sum_d NEU^2_{dit}} \qquad \text{if } \sum_d NEG_{dit} > \sum_d POS_{dit}$$

$$REPCS_{i,t} = 0 \qquad \text{if } \sum_d POS_{dit} = \sum_d NEG_{dit}$$

For each firm-year observation in the dataset (described below), summing is done across all documents published within the last year. For example, if Firm A is audited by Auditor Z, the firm-year measure of *REPCS* for firm A is derived by summing across all news documents pertaining to auditor Z that were published during the 360 days preceding the fiscal year end.

Appendix A provides two examples of the measurement procedure. Both examples relate to the audit firm KPMG. Article 1 relates to news that the audit firm is being fined for performing a poor audit of a client (Independent Insurance). The second article relates to news that the same auditor is organizing the KPMG World Jobs Fair, a world-wide virtual recruiting event that would provide job seekers with great job opportunities. The reputation change score of KPMG based solely on the first article is − 0.00328, while the reputation change score of the same firm based on the second article is 0.00105. Since the news in article 1 is relatively worse than those in article 2, the reputation change score based on article 1 is lower than the one based on article 2.

REPCS represents a reputation change score based on news articles published in a given period. As a relative measure of positive versus negative word counts about an audit firm, the score reflects the balance of the public collective judgment about the audit firm in that period. This balance of public judgment about the audit firm is correspondingly expected to directly impact the firm's reputation. The implication is that, for a given auditor-year, a positive reputation change score is associated with higher reputation relative to the previous year (or a positive *change* in reputation); conversely, negative reputation change score is associated with a lower reputation relative to the previous year. Similarly, a higher reputation change score reflects a higher change in reputation, and a lower change score reflects a lower change in reputation.

There are significant advantages of using language in the news stories to examine the effect of events on capital markets in general, and to predict client firm's earnings and returns in particular. First, examining news reports allows researchers to consider a richer set of events. Instead of focusing on one particular event (e.g. the demise of Arthur Andersen only) or one particular group of events (e.g. auditor failures), researchers can consider a richer set that includes all kinds of events, including those that have positive effects on auditor reputation. Second, considering events that happen over extended time periods provides a more complete set of information (events happening in between major events). Tetlock et al. (2007) state that researchers are better able to identify common patterns in market reactions to events when a more complete set of events related to firm fundamental values is considered. Third, Tetlock et al. (2007) argue that most investors do not directly scrutinize corporate events, but get most of their information as communicated by three main sources: analysts' forecasts, quantifiable publicly disclosed accounting information, and qualitative, narrative-type reports about these events. They add that linguistic variables may have explanatory power incremental to financial and accounting variables because the latter might be incomplete and/or biased measures of firms' fundamentals.

2.4. Hypotheses development.

This study examines the effect of auditor reputation on financial statements credibility using a direct measure of the change in auditor reputation. If investors consider high auditor reputation as a signal for high quality reporting, then one would expect that investors would perceive the financial statements of firms audited by more reputable auditors to be of higher quality, thus more credible. Both Healy and Lys (1986) and Johnson and Lys (1990) contend that monitoring by a reputable auditor improves investors' perceptions about the credibility of client disclosures. In general, financial statements that are audited are perceived as more reliable than non-audited statements because the verification process reduces the bias and noise contained in the financial information (Holthausen and Watts 2001)[5]. One hindrance faces investors, though: auditors' efforts are not directly observable. Therefore, investors are not able to assess the amounts of bias and noise that auditors could reduce thanks to their effort. One available cue investors can observe is the reputation of auditors. As explained above, auditor reputation is the collective judgments made by observers about an audit firm. Therefore, the market can infer the amount of bias and noise that may have been reduced by formulating a judgment regarding the audit firm. Accordingly, the higher the auditor reputation the lesser the amount of bias and noise contained in the published financial statements as perceived by investors.

On the other hand, since the market's perception about the noise in the information signals affect unexpected price changes (e.g. Holthausen and Verrecchia 1988), the fluctuation in the perceived noise of the earnings signal (in our case inferred through auditor reputation) would

[5] Holthausen and Watts (2001) argue that managers can bias earnings to optimize their compensation and/or to confirm to debt covenants. In addition, they can mislead auditors and investors about their manipulation by introducing noise as well as bias (p.29).

be associated with a fluctuation in the price responsiveness of the earnings announcements in the same direction.

Teoh and Wong (1993) develop a model to formally derive the investors' response to the information signal and its precision in relation to auditor size. They show that high levels of noise imply a less accurate and less credible, thus lower quality earnings signal. They conclude that ERC increases with the quality of the earnings signal. Following this line of thought, in the first hypothesis I use the earnings response coefficient to measure the credibility of financial statements as perceived by investors. Since the reputation change score I propose estimates the *change in auditor reputation*, I hypothesize that the *change in the ERC* would be associated with the *auditor reputation change score*.

Therefore, my first hypothesis is given as:

H1: The change in the earnings response coefficient will vary across firms as a positive linear function of the change in auditor reputation.

The logic behind the earnings response hypothesis is that auditor reputation is associated with the perceived noise in the earnings signal. A diminution in the perceived noise would bestow more credibility on the information contained in the financial statements, and would therefore affect the expected cash-flows. On the other hand, decreases in noise and bias in the earnings signal reduce information risk. As information risk decreases, discount rates are expected to follow. I herein supplement the current study with a cost of equity capital test, where I directly estimate equity discount rates and relate the change in the average of these rates to the change in auditor reputation. Recent auditing studies use the cost of equity capital to test their predictions of the quality of financial reporting as perceived by investors (e.g. Khurana and Raman 2004; Khurana and Raman 2006; Boone et al. 2008, Ahmed et al. 2008, Boone et al. 2011). My second hypothesis predicts that clients of auditors with higher reputation change scores are expected to experience a decrease in ex-ante cost of equity capital. Therefore, I conjecture that:

H2: The change in ex-ante equity risk premiums will vary across firms as a negative linear function of the change in auditor reputation.

3. Data and research designs.

3.1. Sample selection.

My sample mainly consists of top 72 audit firms based on total assets audited in 2010, with client data available in Audit Analytics, Compustat and CRSP. Some tests require data to be available in I/B/E/S as well. For 2010, these first 72 auditors generated more than 98% of total revenues generated by auditors in Audit Analytics, and audited more than 75% of client companies.

I focus on post-Andersen time period to avoid the audit firms' mergers waves, and to avoid the reputation consequences of the auditing problems that occurred around the Arthur Andersen demise and the enactment of SOX, a period characterized by a high level of scrutiny by government agencies (SEC and PCAOB), and market participants in general.

Table 1.1 reports that a total number of 275,725 articles are analyzed for the sample period. There are 239,783 articles that cite a Big 4 audit firm and 64,058 articles that cite a non Big 4 auditor. The content analysis classifies more than 268 million words and reports about of 5.4 million instances of positive words and 3.4 million instances of negative words.

(Insert Table 1.1 about here)

Table 1.2 presents the steps used to arrive at my final samples for the different tests. All samples span the seven-year-period from 2003 to 2009. I form the ERC samples from intersecting Audit Analytics, Compustat, and CRSP, and the articles database that I create. For the analysts' forecasts unexpected earnings model, I further limit my sample to observations available on I/B/E/S. I restrict both ERC samples to firms with December 31 fiscal year-ends. The final analysts' forecasts (random walk) sample consists of 22,825 (28,102) firm year observations, respectively.

(Insert Table 1.2 about here)

As for the ex ante cost of equity capital analysis, I further restrict that sample to firm years with estimable cost of equity capital. The final COC sample contains 13,595 firm year observations over the period 2003−2009.

3.2. Earnings Response Coefficient Test of Auditor Reputation Effects.

In order to address the first hypothesis, I employ a research design that associates changes in ERC with changes in auditor reputation as measured earlier. I first collect the news reports about the 72 auditors defined above for the years 2003 through 2009 and construct my measure of change in auditor reputation. I then collect market and financial data about all the client firms in my sample. I then partition the sample period into six 2-year sample periods (2003−2004, 2004−2005… 2008−2009). Next, for each audit firm, and for each of the six 2-year periods, I estimate the following valuation model using an ordinarily least squares regression (OLS). Therefore I estimate this regression model 432 times (432 = 6 bi-annuals periods × 72 auditors). Variants of this valuation model specification have been adopted in prior studies assessing the market perception of auditor attributes (e.g. Teoh and Wong 1993 and Balsam et al. 2003):

$$\begin{aligned} CAR = {} & \beta_0 + \beta_1\, UE + \beta_2\, Y2 + \beta_3\, UE \times Y2 + \beta_4\, UE \times NEG + \beta_5\, UE \times MB \\ & + \beta_6\, UE \times CSIZE + \beta_7\, UE \times BETA + \beta_8\, UE \times AF + \beta_9\, RET \\ & + \beta_{10}\, NEG + \beta_{11}\, MB + \beta_{12}\, CSIZE + \beta_{13}\, BETA + \beta_{14}\, AF + \sum \beta\, IND + \varepsilon_1 \end{aligned} \qquad (1)$$

(Please refer to Table 1.3. Panel A for the description of the variables used in this model)

CAR is the cumulative abnormal returns computed over two days: the day prior to the earnings announcement and the day of the earnings announcement (-1, 0). It is measured as the prediction error from a market model using value-weighted market returns, where the market model parameters are estimated over the 200 days ending 21 days before the earnings announcement date. Following Balsam et al. (2003), I require a minimum of 100 daily stock returns for a company to be included in the sample.

Unexpected earnings *UE* is the earnings per share, net of earnings expectations. The expected earnings number is computed in two ways. In the analysts following model, the expected earnings number is the mean of analysts forecasted earnings immediately prior to the earnings announcement. In the random walk model, the expected earnings number is the earnings per share before extraordinary items for the previous year. The unexpected earnings *UE* is scaled by the stock price two days prior to the earnings announcement. *Y2* corresponds to the latter year in every 2-year sample period. For example, in the two-year sub-sample 2003−2004, for the 2004 observations *Y2* takes a value of one while for the 2003 observations it takes a value of zero.

I add several control variables that have been shown to affect the ERC. I interact the unexpected earnings with (*NEG*), an indicator variable for negative unexpected earnings years. Prior research suggests adding this variable to control for the asymmetric investors response to negative versus positive news (Hayn 1995). The variable (*MB*) is included because prior literature shows that firms with higher growth opportunities have higher ERCs (e.g. Collins and Kothari 1989). Client size (*CSIZE*) controls for the exposure of the client firm to the public and the political costs that might result from this exposure (Watts and Zimmerman 1978). The variable (*BETA*) accounts for the systematic risk and is expected to be inversely related to ERC (Collins and Kothari 1989). I also include the return over the 21 days prior to the earnings announcement until two days before the earnings announcement date (*RET*). Lastly, I add industry dummies that control for industry (e.g. Balsam et al. 2003). For observations available in I/B/E/S (analysts forecast model), I also include the variable (*AF*) to control for analysts following.

The 432 estimated values $\hat{\beta}_3$ thus obtained represent the changes in ERC from the years *(t-1)* fiscal year-end to years *(t)* fiscal year-end in the 2-year sample periods (*CERC*). These *CERC* values are then correlated with the 432 corresponding yearly auditor reputation change scores cross-sectionally using an OLS regression. To test my first hypothesis, I use the following empirical model:

$$CERC = \gamma_0 + \gamma_1\, REPCS + \gamma_2\, CMMB + \gamma_3\, CMCSIZE + \gamma_4\, CMBETA + \gamma_5\, CMAF + \gamma_6\, CMYLD + \varepsilon_2 \qquad (2)$$

(Please refer to Table 1.3. Panel B for the description of the variables used in this model).

I add control variables that are correlated with the *change* in ERC. Since the ERC is estimated by auditor/year, the corresponding control variables in model 2 are the means of the control variables used in the valuation model calculated by auditor/year as well. By doing so, I associate each value of ERC to one summary value of the variables used as controls used in model 1. I then calculate the change in ERC and correlate it to the change in reputation and to the change in the mean control variables. I also add the change in the yield on long-term government bonds (*CMYLD*) as an additional control variable.

My first hypothesis predicts that the change in ERC (as measured by the estimated coefficients $\hat{\beta}_3$ from equation 1) would be positively associated with the reputation change score *REPCS*.

3.3. Ex Ante Equity Risk Premium Test of Auditor Reputation Effects.

Besides the earnings response test, I implement a cost of capital test, where I examine the effect of changes in auditor reputation on the changes in the cost of equity capital. If auditor reputation lends credibility to financial statements and affects investors' perceptions, then the information risk associated with the audited financial statements should be lower for auditors with higher reputation. A lower information risk should translate into a lower cost of equity capital since the discount rate implied by the relation between market prices and expected future earnings would capture auditor reputation effects[6].

I undertake a cost of equity capital analysis similar to Ahmed et al. (2008) and Boone et al. (2011). I estimate the ex-ante cost of equity capital r_{avg} as an average of the measures developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004), as described in Dhaliwal et al. 2007[7]. Since the test variable is a reputation change score that measures the change in auditor reputation, I calculate a change of ex-ante equity risk premium and use it as a dependent variable in the following auditor reputation model, where Cr_{avg} measures the change in the cost of capital:

$$Cr_{avg} = \delta_0 + \delta_1\ REPCS + \delta_2\ CBM + \delta_3\ CBETA + \delta_4\ CCSIZE + \delta_5\ CLEV + \delta_6\ CEVOL + \delta_7\ CLTG + \delta_8\ CRET + \delta_9\ CSPREAD + \sum \delta\ IND + \varepsilon_3 \qquad (3)$$

(Please refer to Table 1.3. Panel C for the description of the variables used in this test)

Cr_{avg} is the change in firm-specific ex ante equity risk premium. The test variable is the reputation change score REPCS, measuring the change in auditor reputation. Hypothesis 2 predicts that the coefficient on the variable of interest *REPCS* to be negative (γ_1<0) because an increase in auditor reputation reduces the information risk imbedded in the financial statements. I control for the hypothesized relationship between the change in COC and the change in

[6] The use of ex-ante cost of capital is better suited to be employed in investors' perceptions tests. First, realized returns are noisy. Second, realized returns may be different from expected returns (Francis et al. 2004). Khurana and Raman (2004) and Boone et al. (2008) use ex-ante cost of capital measures in assessing audit quality and financial reporting credibility.

[7] Dhaliwal et al. 2005 and Dhaliwal et al. 2006 also use some variation of this method.

reputation using the change in control variables used in COC prior literature. The variable *CBM* is shown in prior literature to be positively associated with the ex ante cost of equity capital because of the risk interpretation of the book-to-market ratio explained in Fama and French (1995) and Fama and French (1997). Thus I expect γ_3 to load with a positive sign.I expect a positive sign on the variable indicating the change in systematic risk *CBETA* (γ_2>0), since risk is positively associated with the cost of equity (Sharpe 1964). Change in client size is added as a control variable because large market value is inversely associated with risk (Berk 1995). The coefficient on *CCSIZE* (γ_4) is expected to be negative. I include change in leverage *CLEV* because financial leverage is positively associated with higher risk, hence the expected positive sign of (γ_5>0). *CEVOL* measures the standard deviation of earnings. Gebhardt et al. 2001 argue that earnings volatility is correlated with higher risk. I predict a positive coefficient on *CEVOL* (γ_6>0). In addition, Beaver (1970) and LaPorta (1996) argue that analysts forecasted long-term earnings growth is associated with higher risk because earnings derived from growth opportunities are less certain than normal earnings. Although Gode and Mohanram (2003) argue that it is difficult to predict the effect of long-term growth on the cost of equity capital, most recent studies find a positive correlation between the two variables (e.g. Dhaliwal et al. 2007 and Boone et al. 2011). For this reason, I predict a positive coefficient on the *CLTG* variable (γ_7<0). Following Boone et al. (2011), I also add *CRET* to the model in order to control for the effect of slow analyst updates. I predict a negative sign on the coefficient related to this variable (γ_9<0). The variable *CSPREAD* is included to control for stock liquidity since stock liquidity has been shown to be associated with expected stock returns (Pastor and Stambaugh 2003). I expect a positive sign on γ_8. I finally add industry dummies to control for industry effects (Boone et al. 2011).

4. **Empirical findings**

4.1 Valuation model

4.1.1. Descriptive statistics

Table 1.4 Panel A reports descriptive statistics and correlation coefficients for the dependent and independent variables in the original valuation model using two different specifications of unexpected earnings.

(Insert Table 1.4 Panel A about here)

Section a. i. of Table 1.4 Panel A reports descriptive statistics for the valuation model using mean analysts' forecast as the earnings expectation, while Section a. ii. of the same panel reports descriptive statistics for the random walk unexpected earnings model. The mean cumulative abnormal returns (*CAR*) for model 1 is 0.13 percent over the two-day accumulation period, while the mean for the same variable is slightly higher at 0.16 percent. The mean returns just prior to the earnings announcements for model 1 is -0.62 percent, which is comparable to the -0.53 percent mean returns in model 2. Mean unexpected earnings are negative when using the mean analysts' forecast as the earnings expectation and slightly positive unexpected earnings when using the random walk model. Unexpected earnings are negative 39.49 percent of the time for model 1 and 41.42 percent of the time for model 2. For firms with analysts' forecasts, firms, on average, are followed by 1.42 analysts.

4.1.2. Valuation model results

I partition my sample into six two-year samples, and run the valuation model for each of these samples by auditor. I run the model with two specifications. Model 1 uses unexpected earnings based on mean analysts' forecasts while model 2 uses a random walk specification for unexpected earnings. I obtain 384 (462) regression results after running model 1 (model 2) bi-yearly regression, respectively. After examining the results thus obtained, I retain the coefficients with more than 30 degrees of freedom[8]. This procedure restricts my final sample to 46 (59) ERCs obtained from model 1 (model 2), respectively.

Table 1.5 Panel A contains results from the valuation model as specified in equation 1 above. The mean coefficients columns contain the mean of the regression estimates obtained from the bi-yearly regressions from equation 1. The change in ERC is reflected through the variable *UE*×*Y2*, where *Y2* is a binary variable indicating the latter year in every two-year sample. The mean coefficient for the change in ERC between year *t-1* and year *t* is determined by the parameter estimate $\hat{\beta}_3$. The change in ERC for model 1 is about 1.2 percent whereas model 2 indicates a negative change in ERC of about -5.4 percent. Fama-McBeth (1973) regression statistics indicate that the variables *RET*, *NEG*, *MB*, and the interaction between the variables *UE* and *AF* are significant at the 5% level for Model 1. For the random walk model, only the variables *RET* and *MB* remain significant.

(Insert Table 1.5 about here)

The forty-six (fifty-nine) changes in ERC thus obtained are matched with auditor reputation change scores by auditor and year. The next paragraph presents the results for the change in ERC model.

[8] I rerun the analyses and retain regression results with 200 degrees of freedom or more. The results are qualitatively similar.

4.2 Change in auditor reputation and the change in ERC

4.2.1. Descriptive statistics

Table 1.4 Panel A (sections b.i. and b.ii.) describes the variables used in equation 2. Slightly different models are used in the change in ERC regressions. Since analysts' forecasts data is available when using model 1, I incorporate *CMAF* as variable controlling for the change in mean analysts' following on the change in *ERC*.

Section b. of Table 1.4 Panel A indicates an overall slightly positive mean for the reputation change score of 0.0004. The control variables used for both specifications are comparable. It is worth noting that the change in the mean client size is higher for the random walk sample than the analysts forecast sample (about one and a half times).

With respect to the correlation matrices in Table 1.4 Panel B, the reputation change score variable *REPCS* is positively but marginally correlated with the changes in ERCs (variable *CERC*) for the analysts following specification (correlation coefficient significant at the 10% level). In the random walk model, the correlation coefficient between the two variables is insignificant. While some correlations are significant at the 5 percent level of better, the highest value is for model 1 with 0.61, representing the correlation coefficient between the change in the mean analysts following and the change in the mean annual yield. For model 2, the highest correlation is 0.56 between the change in the mean market-to-book variable (*CMMB*) and with the change in the mean beta (*CMBETA*).

4.2.2. Change in auditor reputation and the change in ERC test results

Table 1.5 Panel B reports the results from running equation 2 above for two specifications: the analysts' forecasts unexpected earnings specification and the random walk unexpected earnings specification. The dependent variable *CERC* is the change in ERC between years *t-1* and years *t*, as obtained from the valuation model 1 above.

As discussed earlier, to the extent that higher auditor reputation reflects positively on investors' perception of the credibility of financial statements, one might expect a higher change in the ERC. Stated otherwise, if auditor reputation is valued by investors, the coefficient on *REPCS* should be positive and significant. However, the reputation change score variable is only marginally significant (at 10%) for the random walk model, and is not significant for the analysts' forecasts model. For Model 1, the change in mean analysts' forecasts is positive and significant at the 1 percent level.

Overall, the change in ERC analyses fail to provide strong support to the hypothesis that auditor reputation is priced by investors. While it might be that investors value the outcomes of the audit and not the reputation of auditors, these results may be due to the limited number of observations used in the change of ERC regressions. In the following sub-section, I supplement the change in ERC analysis with an analysis that uses the change in the ex ante cost of equity capital as a proxy for investor perception of financial statements credibility.

4.3 Cost of Equity Capital model.

4.3.1. Descriptive statistics

Table 1.4 Panel C reports descriptive statistics used in the change in ex ante cost of equity capital analysis. Overall, the COC sample firms are larger compared to the ERC samples. The mean cost of equity capital is about 10.8 percent and the median is about 9.7 percent. Both statistics are comparable to those reported in Khurana and Raman (2004 and 2006) and Ahmed et al. (2008).

As for the change variable used in the regression model, the mean reputation change score is identical to that reported in the ERC analyses, which should be the case, since the reputation change measure is calculated by auditor year and is not firm specific. Overall, the ex ante cost of equity capital increased by about 2 percent. Average risk, client size, leverage, and book-to-market all increased. On the other hand, earnings volatility, mean analysts' forecasts of long-term earnings growth, bid-ask spread, and recent returns have declined, on average.

The correlation table reported in Panel D of Table 1.4 presents several significant correlations at the five percent level or better. In particular, the ex ante cost of equity capital is significantly correlated with most independent variables. Equally important, the reputation change score is significantly correlated with the COC. The variable *REPCS* is also significantly correlated with seven of the eight control variable. While these significant pair-wise correlations reveal an association between the variables used in the model, the risk of a muticollinearity problem can be present.

As reported in the correlation matrix, the highest coefficient is reported for the correlation between the change in the book-to-market variable (*CBM*) and the change in client size (*CCSIZE*), with a coefficient of -73 percent (-72 percent) for the Pearson (Spearman) correlation. Since these values reveal a medium-high risk, I later check whether severe multicollinearity is an issue. Further diagnostic shows low values of variable inflation factors (VIFs), which reveals no serious multicollinearity problem.

4.3.2. Change in ex ante cost of equity capital model results

Table 1.6 presents the results from the change in ex ante cost of equity capital analysis. The dependent variable Cr_{avg} is the change in ex-ante equity risk premium. The ex ante equity risk premium r_{avg} is computed as the average of the four firm-specific implied ex ante equity risk premium measures developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004). Statistical inferences are based on robust standard errors that are adjusted for residual correlation arising from pooling cross-sectional observations across time. The t-statistics are based on White (1980) heteroskedasticity robust variance estimates that are adjusted for firm and year clustering (e.g. Gow et al. 2010). The adjusted R^2 is about 24 percent. The risk related explanatory variables are significant at the one percent level, except for variables *CBETA* and *CLTG*, which are not significant. The VIFs values are less than 2, which indicates no severe multicollinearity problem.

(Insert Table 1.6 about here)

As discussed above, to the extent that higher auditor reputation bestows more credibility on financial statements credibility, investors may demand a lower ex ante return. That is, as auditor reputation increase, the cost of equity capital should decrease. Therefore, the second hypothesis predicts a negative coefficient on the variable measuring the change in the ex ante equity risk premium, Cr_{avg}.

Results in Table 1.6 suggest that the reputation change score variable is negatively and significantly associated with the ex ante cost of equity risk premium, indicating that an increase in auditor reputation is associated with a decrease in ex ante equity risk premium. Economically, a standard deviation increase in the reputation change score variable *REPCS* is associated with a decrease in the change in the ex ante equity risk premium Cr_{avg} by about 0.0015, which represents a 1.5 percent decrease from the median value of Cr_{avg} reported in Table 1.4 Panel C[9]. Therefore, the effect of the change in auditor reputation on the ex ante equity risk premium is statistically as well as economically significant. Thus, a higher auditor reputation is associated with lower ex ante cost of equity risk premium. This result is consistent with the prediction under H2.

4.4. Sensitivity checks.

4.4.1. For the ERC tests.

To check whether the ERC test results are due to variables measurement choices, I rerun the analysts' forecasts regressions using unexpected earnings based on median analysts forecasts instead on mean forecasts. I also use the natural logarithm of analysts following instead of the nominal values reported in I/B/E/S. The results from these analyses are qualitatively comparable to the results presented herein.

Furthermore, I rerun the ERC tests with CAR being estimated for the three-day window consisting of the day prior to the firm's earnings announcement, the day of the announcement and the day after the announcement. The analysis shows that the results are qualitatively similar for the test variable *REPCS* in that it loads with a positive coefficient, and is marginally significant.

[9] Following Boone et al. (2011, p. 429), the economic significance of the change in auditor reputation for the cost of capital by assessing the effect of a one SD increase in the reputation change score variable *REPCS* (0.0002, from Table 1.4) on Cr_{avg} based on the parameter estimate of this variable reported in Table 1.6. Thus, the effect of a one SD increase in *REPCS* is a decrease in Cr_{avg} of $0.0002 \times (-19.5076) = -0.0039$, which represents a decrease of about 4 percent from the median value of Cr_{avg} reported in Table 1.4.

4.4.2. For the COC test.

For the cost of equity capital test, I partition my sample into clients for Big4 and those of Non Big4 companies to see whether a particular sample is driving the results in Table 1.6. After partitioning, the Big 4 sample contains 12,371 firm year observations (about 91 percent of the sample), while the non Big 4 group contains the remaining 1,222 observations (9 percent of the total observations).

Table 1.7 Panel A provides descriptive statistics comparing the two partitions. On average, ex ante equity risk premium is lower of Big 4 clients. Khurana and Raman (2004) argue that investors perceive Big 4 auditors to be providing a higher quality and more credible client financial statements. The results they report are consistent with lower ex-ante cost of equity capital associated with Big 4 audits. These firms experience a higher change the in growth, are increasing in size and have a lower increase in leverage. On the other hand, non Big 4 are becoming riskier, their earnings volatility is decreasing quicker, and their recent returns are also dropping more than for the Big 4 clients. In terms of auditor reputation, while the mean reputation change score for Big 4 firms is more precisely around 0.000447, the mean score for non Big 4 firms is 0.000347, which indicates that overall the Big 4 auditors enjoy a relatively higher reputation. An unreported t-test shows that the difference in the means is 0.00011 and is significant at less than the 1 percent level.

(Insert Table 1.7 about here)

Table 1.7 Panel B reports the results from regressions run by group (Big 4 and non Big 4). Again, all statistical inferences are obtained using standard errors that are robust to firm year clustering. For the non Big 4 clients, only three variables remain significant. These are *CBM*, *CLTG*, and *CRET*. More importantly, the variable *REPCS* loses its significance. The parameter estimates from the Big 4 group, on the other hand, are qualitatively similar to those of the whole sample. The reputation change score *REPCS* remains negative and significant, corroborating the analyses based on all available firm year observations. This is a revealing result since it suggests that auditor reputation is associated with lower ex ante risk premium within the Big 4 firms, that is above and beyond the auditor designation as a Big 4 or a non Big 4 firm.

Overall, while the ERC sensitivity checks of the ERC analysis remain inconclusive, the sensitivity checks extending the cost of capital analysis support the notion that investors price auditor reputation incrementally to whether the auditor is one of the Big 4 firms.

5. Conclusion.

This study examines the effect of auditor reputation on the perceived credibility of financial statements using a *direct measure* of the change in auditor reputation. While prior research focuses on a dichotomous view of auditor reputation, this study presents a more refined measure of the concept and tests whether investors view financial statements audited by reputable auditors as more credible. This research question is timely especially that recent research is rejecting the claim that audit quality is uniform within the Big 4 firms group and within the non Big 4 firms[10].

I employ two sets of analyses. The first examines the effect of the change in auditor reputation on changes in ERC. The second uses the ex ante equity risk premium as proxy for investors' perceptions of financial statements' credibility. The ERC analyses do not reveal a

[10] See Francis (2011) for a recent review.

visible effect, while the cost of equity analysis shows that an increase in auditor reputation is associated with a lower ex ante equity risk premium.

These results are particularly important to audit firms and have direct implications on how they should consider their firms reputation. First, it is important to acknowledge that reputation can fluctuate up and down and that it does not depend only on the size or the network of the firm. As a matter of fact, auditor reputation may differ within a group of peers. Secondly, while it is more apparent that a high reputation directly benefits the audit firm and a tainted one directly harms it, this study shows that reputation has direct implication on client firms and investors' perceptions of the credibility of their financial statements. While these firms devote considerable resources to provide quality audits on the job, audit firms can justify the need for promoting a high reputation of integrity, ethical practices, and excellence.

This study presents a new measure of auditor reputation change and suggests that reputation is priced by capital markets investors. Nonetheless, some limitations should be acknowledged. First, the ERC analyses are not conclusive. This issue might be addressed if more data can be collected for a longer time span. Second, some analyses use the I/B/E/S data. This constraint biases the finding herein since only larger companies tend to interest some analysts. Third, this study is the first to uses the Janis-Fadner index to measure the change in auditor reputation. A new measure has to gain support in the field for it to become standard. Lastly, the Loughran-McDonald 2011 financial sentiment dictionaries are relatively new to the capital markets literature. The dictionaries can be amended and improved. More and further research is warranted to address these limitations and enhance our understanding of audit quality.

Table 1.1. Articles data (for the period 2003 through 2009).

AUDITOR NAME	Auditor Code	Total number of articles	Total number of positive words	Total number of negative words	Total number of relevant words	Total words
PricewaterhouseCoopers LLP	1	27849	612222	390610	16616801	27566776
Ernst & Young LLP	2	72754	1435628	894522	46015500	72703490
Deloitte & Touche LLP	3	69184	1204985	695984	38620585	59995078
KPMG LLP	4	69996	1354812	936908	42881957	68283535
Grant Thornton LLP	6	19863	366899	244190	11399395	17990462
BDO Seidman LLP	7	2617	105255	72511	3626685	5513713
Plante & Moran PLLC	9	1796	36364	18771	1026474	1583100
McGladrey & Pullen LLP	10	702	20199	12503	692428	1060698
BKD LLP	11	195	3993	1235	111988	166320
Moss Adams LLP	13	809	19661	8128	741314	1104772
Virchow Krause & Company LLP	16	355	13587	3757	277188	424325
JH Cohn LLP	22	35	1362	1057	31953	53545
Cherry Bekaert & Holland LLP	24	159	2958	2305	97759	142879
Eide Bailly LLP	27	132	5971	3625	222026	312997
Rothstein Kass & Company PC	33	866	17276	10379	668116	997505
Amper Politziner & Mattia LLP	39	201	3232	1833	141171	212420
Elliott Davis LLC/PLLC	41	167	2526	1509	105643	152733
Schneider Downs & Company Inc	54	244	4465	3065	181152	281395
Marcum & Kliegman LLP	65	393	5757	2950	226781	340122
Hein & Associates LLP	74	213	3790	1579	165172	241836
Mauldin & Jenkins LLC	78	74	457	365	25001	37032
Stonefield Josephson Inc	86	142	3583	1908	111823	177452
Weinberg & Company PA	103	53	2936	2035	125707	182240
Pannell Kerr Forster Texas PC (PKF)	105	450	6658	3183	288170	416190
Kabani & Company Inc	106	138	7346	4102	279737	412963
Ehrhardt Keefe Steiner & Hottman PC	108	90	1422	537	55155	81516
Eisner LLP	121	348	5240	3100	169579	272762
Beard Miller Company LLP	122	81	1109	424	43962	63345
Whitley Penn LLP	131	68	1783	1018	49620	83308
Tait Weller & Baker LLP	142	48	3999	2436	172614	250884
Sherb & Co LLP	148	53	850	351	24362	37062

Table 1.1. Articles data (cont.)

AUDITOR NAME	Auditor Code	Total number of articles	Total number of positive words	Total number of negative words	Total number of relevant words	Total words
Perry-Smith LLP	149	152	5188	2805	165629	260571
Malone & Bailey PC (LLP)	151	122	2352	886	61875	98249
Yount Hyde & Barbour PC	152	30	242	183	17973	26457
Hansen Barnett & Maxwell PC	172	67	4030	2362	153679	227370
Peterson Sullivan LLP/PLLC	193	61	742	295	44981	67197
Haskell & White LLP	202	83	1241	420	45811	70784
Moore Stephens Wurth Frazer & Torbet LLP	204	1	9	21	590	984
Johnson Lambert & Co LLP	235	79	1972	1858	112842	172130
Porter Keadle Moore LLP	240	153	3232	1382	91208	141122
Vitale Caturano & Co PC	257	277	5520	2697	247567	355916
Weiser LLP	287	134	5983	4048	232521	347221
Burr Pilger & Mayer Inc (LLP)	297	130	3180	1943	151902	214793
Mayer Hoffman McCann PC	308	159	2307	1431	115595	162400
Piercy Bowler Taylor & Kern CPAs Ltd	348	33	474	219	29543	36346
Briggs Bunting & Dougherty LLP	566	22	245	89	16065	24758
BDO Dunwoody LLP	644	818	17592	10063	533722	824350
Armanino McKenna LLP	823	95	3913	2489	162222	238935
Odenberg Ullakko Muranishi & Co LLP	885	17	170	115	5753	8992
Raymond Chabot Grant Thornton	1320	417	8285	3701	281995	442573
Dixon Hughes PLLC	1436	257	4696	2173	215257	288183
Friedman LLP	1581	41	889	479	29419	44692
Mazars (France)	1631	143	3754	1369	105533	149552
UHY LLP	1687	220	7660	5314	317617	474123
GHP Horwath PC	1728	89	1400	595	43355	72492
Holtz Rubenstein Reminick LLP	1748	101	1512	1244	62395	95441
Moore & Associates Chartered	1785	266	4811	2682	131741	203457
Reznick Group PC	1798	516	7114	3067	253096	377058
Child Van Wagoner & Bradshaw PLLC	1929	91	1600	601	47250	77044
Bagell Josephs Levine & Co LLC	1942	38	535	203	16679	24703
PMB Helin Donovan LLP	2248	62	4939	3002	192234	292558
KMJ Corbin & Company LLP	2349	76	6591	5101	269909	395419
RBSM LLP	2451	11	102	56	4089	6259

Table 1.1. Articles data (cont.)

AUDITOR NAME	Auditor Code	Total number of articles	Total number of positive words	Total number of negative words	Total number of relevant words	Total words
Kyoto Audit Corporation	2700	3	20	6	800	1117
Rachlin LLP	2709	46	734	486	19371	33274
MSPC CPAs and Advisors PC	2800	35	309	78	11938	17893
Crowe Horwath LLP	2830	684	11648	8352	334536	534669
SingerLewak LLP	2836	108	1785	944	58348	90450
CCR LLP	2843	13	98	51	4967	7709
Total		275,725	5,383,199	3,399,690	169,785,825	268,049,696

Table 1.2. Sample selection procedures.

Panel A. Sample selection procedure for the change in ERC tests.

Data step	Using analysts forecasts UE	Using random walk UE
	Observations	Observations
Firm-year observations available on Audit Analytics and Compustat for the sample period	65,786	65,786
Exclude non-December-fiscal-year-end observations	- 20,588	- 20,588
Exclude observations missing from matching databases	- 8,178	- 7,643
Exclude observations with missing values for control variables	- 14,195	- 9,453
Final sample	22,825	28,102

Panel B. Sample selection procedure for the change in COC tests.

Data step	Observations
Client-year observations available on Audit Analytics and Compustat for the sample period	65,786
Exclude observations with COC not estimable	- 39,129
Exclude observations missing from matching databases	- 356
Exclude observations with missing values for control variables	- 9,852
Exclude observations with missing articles data	- 2,854
Final sample	13,595

Table 1.3. Description of variables.

Panel A: The variables used in the valuation model.

Variable	Description
Dependent variable:	
CAR	cumulative abnormal returns computed over the days (-1, 0) relative to the earnings announcement. It is measured as the prediction error from a value-weighted market returns model. Market model parameters are estimated over the 200 days ending 21 days before the earnings announcement date.
Variables of interest:	
UE	unexpected earnings, measured in two ways: first, as the actual earnings per share (variable ACTUAL from the EPSUS I/B/E/S summary history file) minus analysts forecasted earnings (the mean of I/B/E/S analysts' forecasts of firm's EPS immediately prior to the earnings announcement, scaled by the stock price two days prior to the earnings announcement (Model 1); second, using random walk model, where unexpected earnings are earnings per share before extraordinary items (Compustat IB) minus last years' earnings, also scaled by the stock price two days prior to the earnings announcement (Model 2).
Y2	= 1 if observation is from the second of the two years in each of the 2-years sample periods.
Control variables:	
NEG	= 1 if the client firm reports negative unexpected earnings; 0 otherwise.
MB	market value of equity (Compustat CSHO * PRCC_F) divided by common equity (Compustat CEQ).
CSIZE	client firm size, measured by the natural logarithm of total assets of the prior year-end (Compustat AT).
BETA	systematic risk computed using the 200-day window ending 21 days prior to the cumulation period for CAR.
AF	analysts following, measured as the number of analysts who issued an earnings forecast for the company.
RET	Stock returns from 21 days before the earnings announcement to date through two days prior to earnings announcement date.
IND	industry dummies indicating 1-digit SIC codes.

Panel B: The variables used in equation 2 (to test H1)

Variable	Description
Dependent variable:	
CERC	change in ERC between years *t-1* and years *t*, as obtained from the valuation model.
Variables of interest:	
REPCS	reputation change score measuring the change in auditor reputation, as calculated using the Janis-Fadner index.
Control variables:	
CMMB	change in mean *MB* by auditor/year. Please see Panel A for the definition of *MB*.
CMCSIZE	change in mean *CSIZE* by auditor/year. Please see Panel A for the definition of *CSIZE*.
CMBETA	change in mean *BETA* by auditor/year. Please see Panel A for the definition of *BETA*.
CMAF	change in mean *AF* by auditor/year. Please see Panel A for the definition of *AF*.
CMYLD	change in mean annual *YIELD* calculated for each firm over the annual period ending on the fiscal-year-end date. *YIELD* is the yield on U.S. ten-year government bonds.

Panel C: The variables used in the cost of capital test.

Variable	Description
Dependent variable:	
Cr_{avg}	change in ex-ante equity risk premium. The ex ante equity risk premium r_{avg} is computed at the balance sheet date as the average of the four firm-specific implied ex ante equity risk premium measures developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004). The risk premium is the excess of the estimated cost of equity capital over the yield on the 10-year US Treasury bond. The higher the r_{avg}, the higher the firm-specific equity risk premium.
Variable of interest:	
REPCS	reputation change score measuring the change in auditor reputation, as calculated using the Janis-Fadner index.
Control variables:	
CBM	change in the ratio of market value of common equity (Compustat CSHO * PRCC_F) to the book value of common equity (Compustat CEQ) as of fiscal year-end.
CBETA	change in the systematic risk, computed using the past 60 months of daily stock returns.
CCSIZE	change in client firm size, measured by the natural logarithm of the market value of equity as of fiscal year-end.
CLEV	change in leverage, measured by the ratio of change in total debt (Compustat DLTT + DLC) to total assets (Compustat AT) as of fiscal year-end.
CEVOL	change in earnings volatility, calculated over the current and prior 4 years and is measured as the standard deviation of earnings before extraordinary items and discontinued operations deflated by total assets (Compustat AT).
CLTG	change in mean analysts' forecast of long-term growth in earnings as reported in I/B/E/S.

CRET	change in recent one-year stock returns.
CSPREAD	change in the average of the daily relative bid-ask spread for the 1 year period ended 4 months after fiscal year-end. The relative bid-ask spread is the difference between the quoted ask price and quoted bid price, deflated by the average of the bid and ask quotes.

Table 1.4. Correlation matrix.

Panel A. Descriptive statistics for the variables used in the change in ERC test.

a. Original variables (Model 1)

i. Using mean analysts forecast UE

	CAR	*UE*	*NEG*	*MB*	*CSIZE*	*BETA*	*AF*	*RET*
Mean	0.0013	-0.1491	0.3949	2.7513	6.8320	1.0491	1.4285	-0.0062
Median	0.0009	0.0002	0.0000	1.9747	6.7631	0.9885	1.6094	-0.0033
SD	0.0499	6.3107	0.4888	2.4982	2.0406	0.6281	0.9495	0.0858
N	22,825	22,825	22,825	22,825	22,825	22,825	22,825	22,825

Notes: Please see Table 1.3 for variable definitions.

ii. Using Random Walk UE

	CAR	*UE*	*NEG*	*MB*	*CSIZE*	*BETA*	*RET*
Mean	0.0016	0.0023	0.4142	2.6362	6.5266	0.9488	-0.0053
Median	0.0007	0.0045	0.0000	1.8618	6.5061	0.9094	-0.0046
SD	0.0499	0.2905	0.4926	2.5254	2.0845	0.6453	0.1165
N	28,102	28,102	28,102	28,102	28,102	28,102	28,102

Notes: Please see Table 1.3 for variable definitions.

Table 1.4. Correlation matrix (continued)

b. Change variables (Model 2)

i. Using mean analysts forecast UE

	CERC	*REPCS*	*CMMB*	*CMCSIZE*	*CMBETA*	*CMAF*	*CMYLD*
Mean	0.0012	0.0004	0.0152	0.0736	0.0505	0.0347	-0.1948
Median	-0.0009	0.0004	0.0467	0.0886	0.0934	0.0360	-0.1603
SD	0.0606	0.0002	0.5971	0.1156	0.1489	0.0855	0.4794
N	46	46	46	46	46	46	46

Notes: Please see Table 1.3 for variable definitions.

ii. Using random walk UE

	CERC	*REPCS*	*CMMB*	*CMCSIZE*	*CMBETA*	*CMYLD*
Mean	-0.0054	0.0004	-0.0388	0.1070	0.0568	-0.2334
Median	0.0008	0.0004	0.0124	0.1092	0.0781	-0.1603
SD	0.0524	0.0002	0.5804	0.1249	0.1247	0.4860
N	59	59	59	59	59	59

Notes: Please see Table 1.3 for variable definitions.

Table 1.4. Correlation matrix (continued).

Panel B. Correlations matrix for the variables used in the change in ERC test.

i. Using mean analysts forecast UE (Model 2, *n*=46)

		Pearson correlations						
		CERC	*REPCS*	*CMMB*	*CMCSIZE*	*CMBETA*	*CMAF*	*CMYLD*
	CERC	1.00	0.26	-0.04	**0.39**	-0.10	**0.46**	0.28
	REPCS	0.27	1.00	-0.05	0.06	-0.05	0.04	0.20
	CMMB	-0.03	-0.12	1.00	0.05	**0.37**	**0.41**	0.28
Spearman correlations	*CMCSIZE*	0.19	-0.03	0.03	1.00	-0.07	**0.41**	0.08
	CMBETA	0.04	-0.21	**0.51**	0.04	1.00	0.19	0.00
	CMAF	**0.57**	0.02	**0.31**	**0.44**	0.26	1.00	**0.61**
	CMYLD	**0.37**	0.18	0.08	0.10	0.04	**0.61**	1.00

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

Table 1.4. Correlation matrix (continued).

a. Using random walk UE (Model 2, n=59)

Pearson correlations

Spearman correlations		*CERC*	*REPCS*	*CMMB*	*CMCSIZE*	*CMBETA*	*CMYLD*
	CERC	1.00	0.02	0.02	0.05	0.17	0.07
	REPCS	0.03	1.00	-0.10	-0.10	-0.23	0.07
	CMMB	-0.05	-0.17	1.00	0.14	**0.37**	**0.38**
	CMCSIZE	0.00	-0.10	0.13	1.00	0.12	0.22
	CMBETA	0.13	**-0.37**	**0.56**	**0.26**	1.00	0.11
	CMYLD	0.03	0.09	**0.26**	**0.26**	0.18	1.00

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

Table 1.4. Correlation matrix (continued).

Panel C. Descriptive statistics for the variables used in the change in COC test (Model 3, *n*=13,595).

a. Original variables

	r_{avg}	*BM*	*BETA*	*CSIZE*	*LEV*	*EVOL*	*LTG*	*RET*	*SPREAD*
Mean	0.0671	0.5236	1.2263	7.3602	0.2217	0.2240	0.1516	0.0819	0.0030
Median	0.0544	0.4515	1.0195	7.2562	0.1845	0.0006	0.1349	-0.0005	0.0017
SD	0.0680	0.6706	0.9766	1.9526	0.2115	18.4141	0.1268	0.7472	0.0041
N	13,598	13,595	13,595	13,595	13,595	13,595	13,595	13,595	13,595

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

b. Change variables

	Cr_{avg}	*REPCS*	*CBM*	*CBETA*	*CCSIZE*	*CLEV*	*CEVOL*	*CLTG*	*CRET*	*CSPREAD*
Mean	0.0037	0.0004	0.0387	0.0263	0.0457	0.0025	-0.0008	-0.0097	-0.0378	-0.0009
Median	0.0013	0.0004	0.0109	0.0474	0.0901	0.0000	0.0000	-0.0004	-0.0213	-0.0002
SD	0.0314	0.0002	0.2343	0.4273	0.4727	0.0630	0.0031	0.0487	0.5482	0.0025
N	13,595	13,595	13,595	13,595	13,595	13,595	13,595	13,595	13,595	13,595

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

Table 1.4. Correlation matrix (continued).

Panel D. Correlations matrix for the variables used in the change in COC test (Model 3, *n*=13,595)

Pearson correlations (above diagonal); Spearman correlations (below diagonal)

	Cr_{avg}	*REPCS*	*CBM*	*CBETA*	*CCSIZE*	*CLEV*	*CEVOL*	*CLTG*	*CRET*	*CSPREAD*
Cr_{avg}	1.00	**-0.05**	**0.30**	0.01	**-0.31**	**0.11**	**0.03**	**0.09**	**-0.33**	**0.32**
REPCS	**-0.04**	1.00	**0.02**	**0.03**	**-0.03**	**-0.04**	**-0.02**	**0.03**	**-0.05**	**0.18**
CBM	**0.27**	**0.06**	1.00	**0.04**	**-0.72**	0.01	**0.05**	**-0.16**	**-0.17**	**0.43**
CBETA	0.01	**0.05**	**0.03**	1.00	**-0.02**	0.01	**0.06**	**0.02**	**-0.04**	-0.01
CCSIZE	**-0.28**	**-0.07**	**-0.73**	-0.01	1.00	**-0.20**	**-0.06**	**0.21**	**0.13**	**-0.53**
CLEV	**0.11**	**-0.03**	**0.03**	0.01	**-0.21**	1.00	-0.01	**-0.03**	0.00	**0.13**
CEVOL	**0.06**	-0.01	**0.05**	**0.05**	**-0.07**	0.01	1.00	**0.05**	**0.03**	**0.12**
CLTG	**0.10**	**0.04**	**-0.19**	**0.03**	**0.22**	**-0.04**	0.01	1.00	**0.07**	**-0.06**
CRET	**-0.33**	**-0.04**	**-0.19**	**-0.03**	**0.14**	-0.01	-0.01	**0.07**	1.00	-0.01
CSPREAD	**0.36**	**0.09**	**0.43**	**0.03**	**-0.56**	**0.16**	**0.08**	**-0.07**	**0.03**	1.00

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

Table 1.5. Change in ERC test.

Panel A – Valuation model mean coefficients (Model 1)

$$CAR = \beta_0 + \beta_1 UE + \beta_2 Y2 + \beta_3 UE \times Y2 + \beta_4 UE \times NEG + \beta_5 UE \times MB + \beta_6 UE \times CSIZE + \beta_7 UE \times BETA + \beta_8 UE \times AF + \beta_9 RET + \beta_{10} NEG + \beta_{11} MB + \beta_{12} CSIZE + \beta_{13} BETA + \beta_{14} AF + \sum \beta IND + \varepsilon_1$$

variable	Estimator	Predicted sign	Analysts' forecasts UE			Random walk UE		
			Mean Coef.	Pr > |t|	VIF	Mean Coef.	Pr > |t|	VIF
Intercept	β_0		0.0037	0.3215		-0.2088	0.2129	
UE	β_1	+	-0.0554	0.3207	458.91	-0.2088	0.2128	85.745
Y2	β_2	?	0.0002	0.9049	1.1750	0.0000	0.9944	1.2209
$UE \times Y2$	β_3	?	0.0012	0.8961	448.02	-0.0054	0.4315	6.7837
$UE \times NEG$	β_4	–	-0.1889	0.0506	19.983	-0.0298	0.3238	9.1367
$UE \times MB$	β_5	+	0.0215	0.2543	4.1678	0.0125	0.1452	6.3681
$UE \times CSIZE$	β_6	–	0.0375	0.2079	34.465	0.0362	0.1820	74.649
$UE \times BETA$	β_7	–	0.0024	0.9519	8.4759	-0.0275	0.1717	5.5118
$UE \times AF$	β_8	–	0.1278	0.0175	2.5372	---	---	---
RET	β_9	–	-0.0195	0.0303	1.2630	-0.0261	0.0044	1.2793
NEG	β_{10}	–	-0.0127	0.0000	1.6459	-0.0015	0.2888	1.6721
MB	β_{11}	+	-0.0012	0.0096	1.5031	-0.0020	0.0271	1.7172
CSIZE	β_{12}	?	0.0001	0.9008	3.0845	0.0004	0.6791	2.7096
BETA	β_{13}	–	0.0015	0.2626	1.4740	0.0016	0.3825	1.7015
AF	β_{14}	+	-0.0009	0.3172	1.8604	---	---	---
IND	Not Reported							
Nobs			46			59		
Adj. R^2			0.0522			0.0277		

Notes: The dependent variable *CAR* is the cumulative abnormal return computed for the two-day window consisting of the day before and the day of the firm's earnings announcement. I estimate the model parameters over the 200-day window ending 21 days before the earnings announcement. Unexpected earnings is calculated (1) as the actual earnings per share (variable ACTUAL from the EPSUS I/B/E/S summary history file) minus analysts forecasted earnings (the mean of I/B/E/S analysts' forecasts of firm's EPS immediately prior to the earnings announcement, scaled by the stock price two days prior to the earnings announcement; and (2) as earnings per share before extraordinary items minus last years' earnings, also scaled by the stock price two days prior to the earnings announcement. Please see Table 1.3 for other variable definitions. The model is estimated from bi-yearly cross-sectional observations for the period 2003−2009. Statistical inferences are based on Fama-McBeth (1973) standard errors. All continuous variables used in this model are winsorized at the 3% level.

Table 1.5. Change in ERC test (continued).

Panel B – Change in ERC regression (Model 2)

$$CERC = \gamma_0 + \gamma_1\,REPCS + \gamma_2\,CMMB + \gamma_3\,CMCSIZE + \gamma_4\,CMBETA + \gamma_5\,CMAF + \gamma_6\,CMYLD + \varepsilon_2$$

			Using analysts' forecasts UE			Using random walk UE		
variable	Estimator	Predicted sign	Coef. Estimate (1)	Pr > |t| (1)	VIF (1)	Coef. Estimate (2)	Pr > |t| (2)	VIF (2)
Intercept	γ_0		-0.0491**	0.0883		-0.0169	0.5284	
REPCS	γ_1	+	84.0865*	0.0960	1.0708	16.5560	0.6851	1.0835
CMMB	γ_2	−	-0.0211	0.1271	1.3809	-0.0072	0.4673	1.3423
CMCSIZE	γ_3	−	-0.0931	0.4106	1.3512	0.0118	0.8847	1.0713
CMBETA	γ_4	−	-0.0376	0.6092	1.2294	0.0865	0.1644	1.2215
CMAF	γ_5	+	0.3467***	0.0275	2.3913	---	---	---
CMYLD	γ_6	+	-0.0018	0.9397	1.8585	0.0074	0.7170	1.2289
Nobs			46			59		
Adj. R^2			0.4154			-0.0486		

Notes: The dependent variable *CERC* is the change in ERC between years *t-1* and years *t*, as obtained from the valuation model. *REPCS* is the reputation change score measuring the change in auditor reputation, as calculated using the Janis-Fadner index. Please see Table 1.3 for other variable definitions. The model is estimated from cross-sectional observations for the period 2003−2009. Statistical inferences are based on "robust" t-statistics that are adjusted for residual correlation arising from pooling cross-sectional observations across time, i.e., the t-statistics are based on White (1980) heteroskedasticity-adjusted robust variance estimates that are adjusted for auditor and year clustering (e.g. Gow et al. 2010). Reported significance levels are based on two-tailed tests. VIF denotes the variance inflation factor. All continuous variables used in this model are winsorized at the 3% level. ***, ** and * indicate significant at 1%, 5% and 10% respectively.

Table 1.6. Change in COC test (Model 3).

$$Cr_{avg} = \delta_0 + \delta_1\, REPCS + \delta_2\, CBM + \delta_3\, CBETA + \delta_4\, CCSIZE + \delta_5\, CLEV + \delta_6\, CEVOL + \delta_7\, CLTG + \delta_8\, CRET + \delta_9\, CSPREAD + \Sigma\, \delta\, IND + \varepsilon_3$$

Variable	Estimator	Predicted sign	Coef. Estimate	Robust Standard Error	Pr > |t|	VIF
Intercept	δ_0		0.0155***	0.0012	<.0001	
REPCS	δ_1	–	-19.5076***	1.2321	<.0001	1.0559
CBM	δ_2	+	0.0140***	0.0022	<.0001	2.2019
CBETA	δ_3	+	-0.0008	0.0007	0.2067	1.0149
CCSIZE	δ_4	–	-0.0070***	0.0011	<.0001	2.5677
CLEV	δ_5	+	0.0316***	0.0042	<.0001	1.0862
CEVOL	δ_6	+	-0.1088	0.1024	0.2882	1.0608
CLTG	δ_7	+	0.1130***	0.0059	<.0001	1.0605
CRET	δ_8	–	-0.0181***	0.0005	<.0001	1.0452
CSPREAD	δ_9	+	2.9551***	0.1371	<.0001	1.5036
Nobs		13,595				
Adj. R^2		0.2716				

Notes: The dependent variable Cr_{avg} is the change in ex-ante equity risk premium. The ex-ante equity risk premium r_{avg} is computed as the average of the four firm-specific implied ex ante equity risk premium measures developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004). The risk premium is the excess of the estimated cost of equity capital over the yield on the 10-year US Treasury bond. *REPCS* is the reputation change score measuring the change in auditor reputation, as calculated using the Janis-Fadner index. Please see Table 1.3 for other variable definitions. The model is estimated from cross-sectional observations for the period 2003−2009. Statistical inferences are based on "robust" t-statistics that are adjusted for residual correlation arising from pooling cross-sectional observations across time, i.e., the t-statistics are based on White (1980) heteroskedasticity-adjusted robust variance estimates that are adjusted for firm and year clustering (e.g. Gow et al. 2010). Reported significance levels are based on two-tailed tests. VIF denotes the variance inflation factor. All continuous variables used in this model are winsorized at the 3% level. ***, ** and * indicate significant at 1%, 5% and 10% respectively.

Table 1.7. Cost of equity capital test by auditor group (Model 3).

Panel A. Descriptive statistics for Big 4 / non Big 4 groups

a. The Big 4 group

	Cr_{avg}	*REPCS*	*CBM*	*CBETA*	*CCSIZE*	*CLEV*	*CEVOL*	*CLTG*	*CRET*	*CSPREAD*
Mean	0.0032	0.0004	0.0325	0.0256	0.0520	0.0021	-0.0008	-0.0095	-0.0333	-0.0009
Median	0.0010	0.0004	0.0077	0.0459	0.0959	0.0000	0.0000	-0.0009	-0.0183	-0.0002
SD	0.0311	0.0002	0.2302	0.4190	0.4665	0.0624	0.0030	0.0483	0.5479	0.0024
N	12,372	12,372	12,372	12,372	12,372	12,372	12,372	12,372	12,372	12,372

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

b. The non Big 4 group

	Cr_{avg}	*REPCS*	*CBM*	*CBETA*	*CCSIZE*	*CLEV*	*CEVOL*	*CLTG*	*CRET*	*CSPREAD*
Mean	0.0093	0.0003	0.1013	0.0340	-0.0182	0.0062	-0.0012	-0.0111	-0.0831	-0.0005
Median	0.0057	0.0003	0.0546	0.0646	0.0132	0.0000	0.0000	0.0000	-0.0567	-0.0002
SD	0.0338	0.0002	0.2639	0.5044	0.5265	0.0679	0.0035	0.0518	0.5491	0.0029
N	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223

Notes: Please see Table 1.3 for variable definitions. The bolded correlation coefficients are significant at 5% or better, two-tailed.

Panel B. Cost of equity capital test by auditor group (Model 3)

$$Cr_{avg} = \delta_0 + \delta_1\ REPCS + \delta_2\ CBM + \delta_3\ CBETA + \delta_4\ CCSIZE + \delta_5\ CLEV + \delta_6\ CEVOL + \delta_7\ CLTG + \delta_8\ CRET + \delta_9\ CSPREAD + \Sigma\ \delta\ IND + \varepsilon_4$$

variable	Estimator	Predicted sign	non Big 4 auditors group			Big 4 auditors group		
			Coef. Estimate	Robust Standard Error	Pr > |t|	Coef. Estimate	Robust Standard Error	Pr > |t|
Intercept	δ_0		0.0134	0.0049	0.0064	0.0161***	0.0012	<.0001
REPCS	δ_1	−	-8.8266*	4.8745	0.0704	-21.0296***	1.2870	<.0001
CBM	δ_2	+	0.0337***	0.0068	<.0001	0.0115***	0.0024	<.0001
CBETA	δ_3	+	-0.0014	0.0021	0.4862	-0.0007	0.0007	0.3162
CCSIZE	δ_4	−	-0.0013	0.0034	0.7104	-0.0076***	0.0011	<.0001
CLEV	δ_5	+	0.0355**	0.0152	0.0195	0.0310***	0.0044	<.0001
CEVOL	δ_6	+	0.2367	0.3080	0.4424	-0.1624*	0.1080	0.1327
CLTG	δ_7	+	0.0915***	0.0189	<.0001	0.1154***	0.0062	<.0001
CRET	δ_8	−	-0.0160***	0.0017	<.0001	-0.0183***	0.0005	<.0001
CSPREAD	δ_9	+	1.5940***	0.4137	0.0001	3.1665***	0.1443	<.0001
Nobs			1,223			12,372		
Adj. R^2			0.2043			0.2795		

Notes: The dependent variable Cr_{avg} is the change in ex-ante equity risk premium. The ex-ante equity risk premium r_{avg} is computed as the average of the four firm-specific implied ex ante equity risk premium measures developed by Gebhardt et al. (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004). The risk premium is the excess of the estimated cost of equity capital over the yield on the 10-year US Treasury bond. *REPCS* is the reputation change score measuring the change in auditor reputation, as calculated using the Janis-Fadner index. Please see Table 1.3 for other variable definitions. The model is estimated from cross-sectional observations observations for the period 2003−2009. Statistical inferences are based on "robust" t-statistics that are adjusted for residual correlation arising from pooling cross-sectional observations across time, i.e., the t-statistics are based on White (1980) heteroskedasticity-adjusted robust variance estimates that are adjusted for firm and year clustering (e.g. Gow et al. 2010). Reported significance levels are based on two-tailed tests. VIF denotes the variance inflation factor. All continuous variables used in this model are winsorized at the 3% level. ***, ** and * indicate significant at 1%, 5% and 10% respectively.

Appendix A.

1. Example of a news article that would have a *negative* effect on auditor reputation.

KPMG, the accountancy firm, and one of its partners have been fined a combined £ 500,000 for their role in the collapse of Independent Insurance in 2000.
Andrew Sayers, KPMG's audit "engagement partner" for Independent Insurance, was fined £ 5,000 yesterday by the Joint Disciplinary Scheme (JDS), the regulator for the accountancy profession. It found that he had failed to check pledges from Independent that turned out to be "too good to be true".
KPMG confirmed that Mr Sayers would be paying the fine out of his own pocket. As well its £ 495,000 fine, the group will pay £ 1.15million costs.
Independent collapsed after it was unable to meet its obligations to customers and the Financial Services Authority had to pay out £ 357million in compensation.
Michael Bright, Independent's founder, was sentenced to seven years in prison after a 19-week trial last year.
The JDS said yesterday that Independent's statements should have caused "obvious suspicion".
It said that, in 1999, Independent had purchased reinsurance cover, known as stop-loss cover, because of mounting insurance claims. Buying this type of insurance would have meant Independent would have had to set aside less capital, benefiting profits. The following year, according to the JDS, Independent told KPMG that it was buying more cover. "The effect of this was that for a premium of £ 77 million, Independent would be able to turn a loss of £ 105 million into a profit of £ 22 million," JDS said in the report. "This was too good to be true."
The accountants said: "KPMG regrets that there were shortcomings in certain aspects of its audit of Independent and we accept that we could have done better."

——— positive words
------ negative words

	Article 1
Total words	289
Stop words	129
Relevant words (NEU)	160
Positive words (POS)	5
Negative words (NEG)	12

POS = 5
NEG = 12
NEU = 160

Since NEG > POS , $REPCS = \frac{(NEG \times POS)\text{-}NEG^2}{NEU^2}$

$$REPCS_{(\text{KPMG, Article 1})} = \frac{(12 \times 5) - 12^2}{160^2} = -0.00328125$$

Appendix A. (continued).

2. Example of a news article that would have a *positive* effect on auditor reputation.

Experienced professionals, recent and prospective college graduates and others interested in career opportunities with the KPMG network of professional firms, providing audit, tax and advisory services, can participate in the September 24 - 26 "KPMG World Jobs Fair," a live, 48-hour global virtual recruiting fair. The "KPMG World Jobs Fair," taking place online from 9 a.m. GMT, Wednesday, September 24, to 9 a.m. GMT, Friday, September 26, aims to provide qualified, interested candidates with information on hundreds of job opportunities, particularly in tax, advisory and specialized audit services, with KPMG member firms worldwide. More than 10,000 interested applicants have already registered for the online event through KPMG's global website at http://www.kpmg.com/ .

During the event, KPMG's first external virtual job fair, participants will have the opportunity to chat with KPMG recruiters and network with KPMG professionals, particularly in high growth markets where KPMG expects to substantially expand its operations over the next several years.

"As an increasing number of companies conduct business internationally, there are growing opportunities for professionals in many KPMG member firms - especially in emerging markets such as Brazil, Russia, India, and China," said Timothy P. Flynn, KPMG chairman. "We're also focused on adding thousands of jobs to support KPMG member firms' continued growth in developed markets such as United States and Europe, including drawing specialists from around the world experienced in IFRS (International Financial Reporting Standards) as the world moves to that global accounting standard."

"The KPMG World Jobs Fair reflects a remarkable transformation in how KPMG member firms are attracting talent in a global economy - and a transformation in the way that professionals are seeking employment," said Flynn. "This event allows interested job candidates to easily explore opportunities and a potential career with KPMG, and it gives us an opportunity to tap into a global workforce. We expect it will attract thousands of qualified professionals and recent graduates worldwide."

The World Jobs Fair follows the success of a similar internal online event that 12 KPMG member firms held in May for employees and partners interested in exploring international rotation opportunities. The internal event attracted nearly 5,000 KPMG employees and partners, representing 104 countries, with the highest percentage of participants from the U.K., followed by the U.S., Germany, and China. The largest groups of participants by level were associates and senior associates, at 42 percent and 34 percent, respectively.

45 Member Firms

The global, virtual event this month will include an exhibition hall that features booths covering 45 participating KPMG member firms. Job seekers will be able to learn more about available opportunities in specific countries, and information on KPMG's culture, values, corporate citizenship goals, training and development and work/life programs.

Participants will also have the opportunity to watch live webcasts, chat with KPMG audit, tax and advisory professionals about a career with KPMG and apply for positions directly from the event.

"Clients are global and they need professionals with global audit, tax and advisory skills," said Flynn. "Taking advantage of global opportunities through an event like the KPMG World Jobs Fair helps people expand their skills and cultural perspective. At the same time, it gives KPMG a chance to help our member firms better serve their clients. It's what helps make KPMG an employer of choice."

In addition to KPMG member firms in Brazil, Russia, India and China, other KPMG member firms participating in the KPMG World Jobs Fair include Albania, Australia, Bahrain, Belarus, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Czech Republic, Egypt, Estonia, Germany, Hungary, Ireland, Italy, Japan, Kosovo, Kuwait, Latvia, Lithuania, Macedonia, Malaysia, Mexico, Moldova, Montenegro, Oman, Pakistan, Poland, Qatar, Romania, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, Switzerland, U.K., U.S., United Arab Emirates and Vietnam.

Menlo Park, Calif.-based software maker Unisfair is providing the technology KPMG is using to power its virtual career fair event.

About KPMG International
KPMG is a global network of professional firms providing audit, tax and advisory services. We operate in 145 countries and have 123,000 people working in member firms around the world. The independent firms of the KPMG network are affiliated with KPMG International, a Swiss cooperative. Each KPMG firm is a legally distinct and separate entity and describes itself as such.

——— positive words
------ negative words

	Article 2
Total words	717
Stop words	223
Relevant words (NEU)	494
Positive words (POS)	16
Negative words (NEG)	0

POS = 16
NEG = 0
NEU = 494

Since POS > NEG , $REPCS = \frac{POS^2 - (NEG \times POS)}{NEU^2}$

$$REPCS_{(KPMG,\ Article\ 2)} = \frac{16^2 - 0}{494^2} = 0.0010490$$

CHAPTER TWO: ACCOUNTING ACCRUALS INTENSITY AND AUDITOR INDUSTRY SPECIALIZATION.

1. Introduction.

Client companies regard industry knowledge and expertise as a desirable audit firm attribute as evidenced by their willingness to pay a fee premium to auditor industry specialists (e.g. Craswell et al. 1995, DeFond et al. 2000, and Ferguson et al. 2003). In this study, I test whether the intensity of accruals is a factor that influences the decision to hire an industry specialist auditor. On one hand, one can argue that the use of an industry specialist auditor helps firms manage the costs that arise from accounting accruals, and hence the probability of choosing an industry specialist auditor would be positively associated with the client firm's level of accounting accruals. On the other hand, high accrual firms might be regarded as risky clients and specialist auditors may prefer to preserve their reputation as industry experts by avoiding such clients (e.g. Choi and Wong 2007). This particular aspect of the industry specialist auditor choice has not been examined in prior literature.

Extant research argues that some firms have valid reasons to hire industry specialist auditors compared to non-specialists, despite the specialists' higher fees (e.g. Godefrey and Hamilton 2005, Mascarenhas et al. 2010, Cahan et al. 2008, Ettredge et al. 2009). Such reasons include information asymmetry between owners and managers and the risk that managers will expropriate capital provided by owners and lenders. On the other hand, there is some evidence that some firms have other valid reason for not choosing a specialist. One reason is that industry experts charge higher fees than non-experts (e.g. Craswell et al. 1995). As noted above, I test whether accrual intensity is a major determinant of firms' willingness to engage industry specialist auditors. I argue that firms with large accounting accruals face greater agency costs inherent to accruals (Francis and Krishnan 1999, Krishnan 2003) and thus demand high quality assurance services to help reduce the perceived agency costs arising from high-accruals (Francis et al. 1999). In other words, hiring an industry specialist is considered as an important bonding mechanism for signaling a firm's accrual quality and reducing agency/adverse-selection costs associated with high accrual intensity. Such costs include, for example, higher ex ante cost of equity capital (e.g. Wong 2008, Li et al. 2009).

From a supply side, the specialist auditor possesses expertise in designing audit programs that permit audit staff to effectively and efficiently deal with industry-specific audit risk that arises from economic factors unique to or especially pronounced in the particular industry (e.g. Owhoso et al. 2002). For example, industry auditor specialists issue opinions with less delay (Asthana 2008). Accordingly, an industry specialist auditor is likely to emerge as the most efficient provider of audit services when industry-specific audit risk is important. While the extent of industry-specific audit risk admittedly varies across industries, within industries such risk is likely to be more severe as accounting accruals increase. This is because high levels of accruals increase inherent risk (Francis and Krishnan 1999). Thus, for firms with higher accruals, the industry specialist auditor is more likely to be the most efficient provider of audit services. These supply side considerations suggest that the probability of hiring an industry auditor specialist is associated with the level of accounting accruals.

In summary, both demand side and supply side arguments lead to the prediction that client accrual intensity is associated with choice of an industry specialist auditor. From a demand side, industry specialist auditors reduce investors' concerns concerning accrual quality and hence reduce the ex-ante risk premiums paid to investors. The greater the accrual intensity of the firm the greater the reduction in ex-ante risk premiums, and hence the greater the demand for the industry specialist. From a supply side, industry specific audit risk increases in accounting accruals, implying that the industry specialist auditor is more likely to emerge as the efficient provider of audit services as accrual intensity increases.

Empirical findings suggest that high accrual intensity is negatively and significantly associated with the choice of an industry-specialist auditor. Stated otherwise, I find that companies with high levels of accrual intensity more likely to be audited by non-industry-specialist auditors. These results are overall consistent through several measures of accrual intensity (total accruals, short term accruals, and using an indicator variable indicating accrual intensity above the mean), and several specifications of auditor industry expertise.

The linkage between accrual intensity and choice of an industry auditor specialist is heretofore unaddressed, which allows this study to offer several incremental contributions to the literature. First, this study provides an additional explanation for the demand by companies for the services of an industry expert auditor. Second, it fills in a gap in the extant literature by highlighting the role of accruals intensity as a firm characteristic that may be factored in when making a choice regarding who is well suited to audit the books. Finally, this study sheds some light on strategies companies follow to avoid the consequences of audit errors and in the same time maintain an adequate level of credibility for their financial statements.

These considerations are important especially in the light of the recent report issued by the Advisory Committee on Improvements to Financial Reporting to the United States Securities and Exchange Commission (2008) in which the committee recommends eliminating industry-specific guidance[11]. If such guidance is eliminated, auditors with no industry expertise would have less specific GAAP guidance, therefore industry specialization would stand out as an invaluable characteristic that would play a more important role in determining auditor choice.

The paper unfolds as follows. In section 2, I review the literature. In section 3, I outline the methodology I use to test my hypotheses. I present empirical findings in sections 4 and 5, and concluding comments in section 6.

[11] Recommendation 1.6 (p.9) of the report.

2. Prior research and hypotheses development.

2.1. Why do firms choose an industry specialist auditor?

Industry expertise is a quality indicator that helps differentiate the quality of audits among large audit firms (Craswell et al. 1995). According to DeAngelo (1981), audit quality is defined as "the market-assessed joint probability that a given auditor will both (a) discover a breach in the client's accounting system, and (b) report the breach" (p.186) . In this sense, auditor specialization is in demand by clients because specialization is perceived to enhance the auditor's ability to detect and report attempts to undermine shareholders' wealth (Godfrey and Hamilton, 2005). Evidence from prior studies suggests that industry specialists provide higher quality both in fact, and as perceived by market participants.

For example, O'Keefe et al. (1994) provide evidence that industry specialist auditors are technically more competent than those that lack industry-specific knowledge. Owhoso et al. (2002) find in an experimental setting that industry specialist managers and seniors have an incremental contribution to the audit team's overall effectiveness by detecting more mechanical and conceptual errors. Carcello and Nagy (2004) find that specialists are better at detecting and deterring financial fraud. Low (2004) provides evidence that the auditors' knowledge in the client's industry improves their audit risk assessment and has a direct positive effect on the nature and the perceived quality of their audit planning decisions.

Overall, the extant research suggests that auditor industry specialization is associated with high audit quality, and that the demand for auditor specialization is a demand for higher quality auditing.

Other studies, though not addressing auditor specialization, are pertinent for understanding how accruals may influence the choice to hire an industry specialist. These studies (e.g. DeFond 1992, Copley et al. 1995, Francis et al. 1999, Kim et al. 2003, and Chaney et al. 2004) build on the argument that the information asymmetry between managers and owners can lead to management shirking, and that the demand for auditing arises as a response to this agency problem (DeFond 1992). It follows that the degree of severity of this problem and the level of agency costs faced by the client play a major role in the choice of an auditor: the greater the agency costs, the greater the demand for higher quality audits. For example, Copley et al. (1995) argue that for the municipal audit market, the size of the municipality, its leverage (debt per capita), and an index of client complexity are all indicators of the level of the client's agency costs, thus they can be considered as higher quality audit "demand shifters".

Following the same line of thought, DeFond (1992) adds that management ownership can be an important determinant of auditor switch to a higher quality auditor since the greater the ownership, the more closely aligned management and the other owners interests', thus the lesser the agency costs. Interestingly, the author also argues that agency costs are higher when short-term accruals are higher. Alluding to the fact that short-term accruals are more prone to manipulation (e.g. Healy 1985), the author states that "the relatively larger these accounts, the greater the vulnerability to manipulation and the greater the demand for monitoring", p.22.

DeFond (1992) investigates whether changes in factors affecting agency costs explain auditor quality upgrades and downgrades in the quality of auditor used, where auditor quality is proxied by auditor size, name-brand reputation, expertise, and independence. His results suggest that changes in management ownership and leverage are associated with changes in quality level of an audit firm. However, he finds that the change in short term accruals does not explain the shift to an industry specialist auditor. The author explains that these results might indicate that firms with higher accruals can be considered as riskier. In that case, higher quality auditors would prefer not to accept them as clients. The author does not provide evidence on this alternative explanation.

In line with the agency cost explanation, Mascarenhas et al. (2010) present a choice model for industry expert auditors. Implicitly, the authors view that clients' agency costs are positively associated with client size, client capital intensity, client operating cycle, firm growth opportunities, short and long-term financial structures of the firm, and membership in regulated industries. From this stand point, they expect and find that these indicators are positively related to the choice of industry expert auditors.

While quality is a major aspect of the choice of an industry expert auditor, some other studies investigate several other factors associated with this choice. For example, Godfrey and Hamilton (2005) investigate whether client firm's R&D intensity is associated with audit quality, as indicated by R&D specialization, auditor name, or industry market share. The authors do not empirically investigate the choice of an industry specialist auditor, but find strong evidence that the choice of a top-tier auditor is associated with small auditees' R&D intensity. They also find a significantly positive association between R&D intensity and auditor industry market shares, and that this result is driven by smaller firms.

Cahan et al. (2008) add that the demand for a specialist auditor is determined by greater levels of information asymmetry rising from the nature and levels of industry specific investment opportunity set (IOS) within an industry. They find that companies with high IOS levels have greater asymmetry and more complex accounting and auditing issues. Thus, they are in more demand for auditor specialization than those firms with lower IOS.

Lastly, Ettredge et al. (2009) examine client, industry, and country factors expected to affect the choice of an industry specialist outside the U.S. Following prior literature, their main assumption is that the demand for quality differentiated audits is an increasing function of proxies for firms' agency costs stemming from information asymmetry between principals and agents, and accentuated in environments with higher opportunities for managers to commandeer capital availed by other stakeholders. They add that there are industry factors that affect the choice of a specialist auditor. They argue, for instance, that in industries with high concentration, clients would not prefer to use the same auditor because of fear of information leaks. Therefore they expect that client firms would avoid industry expert auditors in concentrated industries. In addition, they claim industry expertise is more valued in regulated industries. They reason that in these industries, regulators often issue specific accounting and auditing guidance. Industry experts would be more familiar with such regulations.

For their last argument explaining the choice of industry expert auditor, Ettredge et al. (2009) identify environments where the information asymmetry problem is expected to be less acute. For instance, they propose that in countries where the interests of investors are better protected against expropriation of wealth and where high-quality information is more valuable, industry specialist auditors would be more in demand. Looking at the period between 1993 and 2005, they find that client size, client growth opportunities, and client capital intensity are firm characteristics that motivate client companies to select industry expert auditors. They also find that membership in a regulated industry is positively related to the choice of an industry specialist, and that this choice is more popular in countries that are more developed, in countries with higher levels of investor protection, and in those with higher quality of financial reporting.

Overall, it appears that the severity of the information asymmetry and the resulting level of moral hazard and/or adverse selection costs is the main driver for the demand of an industry specialist audit firm. While there have been some suggestions that the level of accruals would affect the level of agency costs facing the firm (DeFond 1992), none of the studies provide evidence that the level of accruals is a determinant of the choice of auditor industry specialization. Below, I develop the idea that accounting accruals should influence this choice.

2.2. The effects of accounting accruals.

Accounting accruals are an important component of earnings. They mitigate timing and matching problems related to realized cash flows, and they provide value relevant information to investors (e.g. Dechow 1994, Subramanyam 1996). However, estimating accruals usually involves judgment and is subject to managerial discretion. Because of the high degree of estimation inherent in their measurement, accruals reflect errors in managers' assessment of a firm's business prospects (e.g. Gong et al. 2009). Further, because they are subjective, management can intentionally bias accruals for self-serving reasons (Healy 1985, DeAngelo 1988, McNichols and Wilson 1988).

The risk of intentional or unintentional misstatement associated with accruals is acknowledged by the Statement of Auditing Standards (SAS) 47 (AICPA 1983), which indicates that the risk of financial statements containing material misstatements is higher in the presence of accounts consisting of amounts derived from accounting estimates than in the presence of accounts consisting of relatively routine, factual data.

High accrual environments exacerbate agency problems within client firms (Francis et al. 1999, Krishnan 2003). The greater risk of intended and unintended misstatements, and the higher information asymmetry associated with the intensity of accruals can potentially increase the problems of moral hazard and adverse selection. In such cases, investors can demand higher returns and greater monitoring. As discussed next, prior literature identifies at least three consequences of booking high levels of accruals.

High accrual firms are required to pay a higher cost of equity capital. Wong (2008) provides some evidence consistent with this conjecture. Using Australian data from 1992 to 2006, his study documents a positive relationship between total accruals and the cost of equity capital as measured by both the unadjusted and the industry-adjusted earnings-price ratio. These findings suggest that total accruals are viewed by investors as an indicator of lower accounting quality. Li et al. (2009) confirm these findings for a subsample consisting of 1,080 firm-year observations from 1999 to 2004. Francis et al. (2004) add that the quality of accruals is also associated with the cost of equity. In a sample covering the years from 1975 to 2001, they find that the higher the accrual quality the lower the cost of capital.

In addition, high accrual firms suffer from a higher likelihood of audit opinion qualification. Francis and Krishnan (1999) show that other things being equal; auditors are more prone to issue qualified audit report for asset realization uncertainties and going concern problems for firms with high accrual intensity. They explain that auditors lower their threshold for issuing a modified report to lessen the likelihood of issuing a modified report when appropriate. They refer to this behavior as auditor reporting conservatism, and they demonstrate that auditors are more conservative in the presence of high accruals. They also show that auditors are more conservative in the presence of income-increasing accruals than income-decreasing accruals. In parallel, there is evidence suggesting that the market perceives qualified reports as informative, and investors react negatively to audit qualifications (e.g. Dopuch et al. 1986, Choi and Jeter 1992, Loudder et al. 1992).

Third, auditors need more time and effort to examine high levels of accruals. Besides, the higher likelihood of misstatements inherent to accruals requires more audit work and may lead to audit report lag (Bamber et al. 1993). Other evidence suggests that the audit hours are significantly higher in the presence of large positive abnormal accruals than in firm-observations with small positive abnormal accruals (Carmanis and Lennox 2008). The audit delay can be costly for the firm in two ways. First, audit delay increases the audit fee due to the increase in the number of audit hours (Bell et al. 2001). Second, audit delay can in turn lead to earnings announcement delay. Prior literature documents lower abnormal returns associated with delayed earnings announcements than early announcements since delayed earnings lack timeliness and since the announcements are more likely to contain bad news (Chambers and Penman 1984, Givoly and Palmon 1982, Kross 1982, and Kross and Schroeder 1994). Moreover, other evidence suggests that abnormal audit report lag has a significant negative impact on firm valuation, and that investors value audit report delay skeptically and incrementally to earnings announcements delay (Asthana 2008).

In sum, high accruals are associated with agency problems that translate into higher cost of capital, higher likelihood of audit qualification, and longer audit delay. These problems have detrimental consequences to client companies, and these consequences are aggravated with greater accruals intensity. As I explain below, the selection of an industry specialist auditor may help firms mitigate these adverse accrual-related consequences.

2.3. Industry specialist auditors and accounting accruals.

The AICPA acknowledges that the risk of material misstatement of accounting estimates is uneven across financial statements and that it "varies with the complexity and subjectivity associated with the process, the availability and reliability of relevant data, the number and significance of assumptions that are made, and the degree of uncertainty associated with the assumptions" (AICPA 1988a). The same statement adds that (p. 4):

> "In evaluating whether management has identified all accounting estimates that could be material to the financial statements, the auditor considers the circumstances of the industry or industries in which the entity operates, its methods of conducting business, new accounting pronouncements, and other external factors."

Industry expert auditors are perceived to enhance the auditor's ability to detect and report attempts to undermine shareholders' wealth (Godfrey and Hamilton 2005). They not only have the competence to provide high quality audits, but they also have incentives to do so (Mascarenhas et al., 2010). On one hand, because of their industry-specific experience and knowledge, industry specialists are better equipped to identify a client's business and audit risks (Craswell et al. 1995, Hogan and Jeter 1999, Solomon et al. 1999, Gramling and Stone 2001). On the other hand, because of the costly specific investments in developing a brand name and a reputation in their sector of expertise, industry specialists are particularly susceptible to litigation exposure and to reputation concerns, which makes them more likely to maintain their independence both in fact and in appearance (Lim and Tan, 2008).

Consistent with these arguments, Taylor (2000) examines the effects of auditor specialization on auditors' assessment of inherent risk. He designs an experiment using a group of auditors specialized in the banking industry and another group of auditors who do not specialize in that industry. The auditors then make judgments concerning two elements: a banking related accrual (loans receivable) and an account not specific to the banking industry (property and equipment). He finds that the difference in assessed inherent risk assessment for the non-banking auditors and the banking specialist auditors is larger for the loans receivable accrual account than for the non-specific property and equipment account. Moreover, non-specialists reported less confidence with respect to their assessment. The author interprets this result as evidence that industry specialization affects inherent risk assessment when more industry specific accruals are to be verified.

Prior research predicts that hiring an industry expert auditor helps mitigate agency costs. Based on the arguments that industry experts have a better understanding of the client's business and risks, and that they perform higher quality audits, Ahmed et al. (2008) find that hiring industry experts is overall associated with a significantly lower cost of equity capital. In particular, they report that one measure of industry expertise is associated on average with a significant decrease of the cost of equity by 20 basis points, while a second measure is associated with a significant decrease of 10 basis points in the same cost. They add that in light of the mean and median market values for their sample, the reported reductions in the cost of equity are also economically significant. Since industry specialist are effective in reducing cost of capital, and since high accruals tend to increase cost of capital, high accrual firms have incentives to hire industry expert auditors.

Another issue at stake for firms displaying large accruals is the higher likelihood of audit opinion qualification. While the concern over report modification over uncertainties is significantly alleviated after the issuance of SAS 79 (AICPA 1995), the issuance of a modified report for going concern is still of concern. SAS 59 suggests that going-concern evaluation is based on the auditor's professional judgment (AICPA 1988b). It obliges auditors to report based on their knowledge of the client at the time of reporting. Auditors can make judgment errors and Geiger and Rama (2006) examine the errors auditors commit when issuing a going-concern opinion. They notice that auditors can issue both Type I and Type II errors. The authors note that clients do not welcome modified reports for going concern especially if the auditor conclusion is unsubstantiated based on their later viability. They find overall that both types of errors are significantly lower for the Big 4 auditors compared to the non-Big 4 firms. Thus, since accruals increase the likelihood of qualified audit opinions, and since industry specialists industry specialist auditors are expected to make fewer Type I errors, then high accrual firms have incentive to hire an industry expert audit firm.

As for the third problem, Asthana (2008) shows that auditor industry expertise is associated with a lower audit delay. The reported results indicate that hiring an industry specialist auditor significantly reduces audit delay by about one day, other things being equal. Since audit delay is costly, and since industry expert auditors are more efficient, then high accrual firms have incentive to hire an industry specialist auditor.

Taken together, there are strong theoretical arguments supported by empirical evidence that firms with high accruals intensity have incentives to choose an industry specialist auditor. Thus my hypothesis:

H_1: The use of an industry specialist auditor is positively associated with the accrual intensity of the client.

3. Research design.

3.1. General model specification

In this study, I investigate whether the use of an industry specialist auditor is positively associated with the accrual intensity of the client. I use the following specification:

$$
\begin{aligned}
SPEC_i^* &= \boldsymbol{\beta} \mathbf{X}_i + \varepsilon_i \\
&= \beta_0 + \beta_1\, ACINT + \beta_2\, SIZE + \beta_3\, CAPINT + \beta_4\, ISS + \beta_5\, LCYC + \beta_6\, PE \\
&\quad + \beta_7\, CUR + \beta_8\, EMP + \beta_9\, REGIND + \beta_{10}\, LOSS + \beta_{11}\, LEV \\
&\quad + \beta_{12}\, ATURN + \beta_{13}\, RD + \varepsilon
\end{aligned}
\tag{1}
$$

$$
SPEC_i = \begin{cases} 1, & if \quad SPEC_i^* > 0 \\ 0, & if \quad SPEC_i^* \leq 0 \end{cases}
$$

and $\quad \text{Prob}_{(\text{SPEC}=1)} = \dfrac{1}{1 + Exp(-\beta X)}$

Where $SPEC_i^*$ is the unobserved benefit from choosing an industry expert auditor, observed as $SPEC$=1 if $SPEC^* > 0$ and $SPEC = 0$ otherwise. Assuming error ε_i follows a logistic distribution, then $\text{Prob}_{(\text{SPEC}=1)} = \dfrac{1}{1 + Exp(-\beta X)}$ and (1) is estimable as a logit binary choice model. *ACINT* is the variable of interest and measures accrual intensity as discussed in 3.3 below (please refer to Table 2.1 for a detailed description of all variables).

I estimate this model as a logit binary choice model by maximum likelihood and base statistical inferences on White (1980) heteroskedasticity-adjusted robust variance estimates.

3.2. The dependent variable: Measure of Auditor Specialization.

Prior literature primarily defines auditor specialization based on market shares. Under this approach, an audit firm is designated as industry specialist if its annual market share of the industry exceeds some threshold, where annual market share is based on annual audit fees and is defined as:

$$MS\_FEES_{ik} = \frac{s_{ik}}{S_k} \tag{2}$$

In (2), s_{ik} is the total audit fees earned by audit firm i from all clients within an industry k, and S_k is the total audit fees earned by all auditors from all clients within industry k.

Under the first definition of auditor specialization, *SPECF1*=1 if the auditor with the largest annual industry market share (as measured by *MS_FEES*) exceeds the second largest annual industry market share by at least 10%, and *SPECF1*=0 otherwise (e.g. Mayhew and Wilkins 2003). Other definitions will be used in additional tests.

3.3. The test variable: Measures of Accruals Intensity.

I use three basic groups of measures for accruals intensity. My first measure is a measure of absolute aggregate accruals (*ACINTA*). Consistent with Hribar and Collins (2002), I calculate ACINTA as the absolute value of the difference between earnings (Compustat IBC+XIDOC) and cash flow from operations (Compustat OANCF).

In my second measure (*ACINTD*), I disaggregate total accruals into individual components and sum the absolute value of each component. Francis and Krishnan (1999) argue that this measure is a better measure of accruals intensity and the uncertainty associated with the accruals. Following Hribar and Collins (2002), these components are: (1) changes in accounts receivable (Compustat RECCH), (2) changes in inventory (Compustat INVCH), (3) changes in accounts payable (Compustat APALCH), (4) changes in taxes payable (Compustat TXACH), (5) net changes in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC).

I measure *ACINTA* and *ACINTD* using two definitions of accruals: total accruals (i.e., all accrual components) and working capital accruals related to operations (i.e., accrual components 1-5 above). Respectively, the measures of *ACINTA* and *ACINTD* based on total accruals are denoted *ACINTA_TAC* and *ACINTD_TAC*. Similarly, the measures of *ACINTA* and *ACINTD* based on short-term operating accruals is denoted *ACINTA_STA* and *ACINTD_STA*, respectively.

My third measure, based on Francis and Krishnan (1999), captures the intensity of positive versus negative accruals separately, yielding two variables—one measuring the intensity of income increasing accruals and a second measuring the intensity of income decreasing accruals. I measure income increasing accruals by adding increases in current asset operating accounts (accrual components 1, 2 and 5 above) to the absolute values of decreases in current liability operating accounts (accrual components 3 and 4 above) to yield a measure of the net income increasing accruals for which I calculate the annual industry median value. I then assign a value of one to *HPACC* if the firm's income increasing accruals exceed the annual industry median value, and zero otherwise. Similarly, I add the absolute values of the decreases in current operating asset accounts to the increases in current liability accounts and depreciation expense to yield a measure of income decreasing accruals. I calculate the annual industry median value of income decreasing accruals and assign a value of one to *HNACC* if the firm's income decreasing accruals exceed the industry median value.

To summarize, my proxies for accrual intensity are *ACINTA_TAC*, *ACINTA_STA*, *ACINTD_TAC*, *ACINTD_STA*, *HPACC* and *HNACC*. Following Francis and Krishnan (1999), all accrual intensity measures are deflated by sales. Please see Table 2.1 for detailed operational definitions of each variable.

3.4. Control variables.

I include several variables that have been show to affect the likelihood of firms choosing an industry specialist auditor. I include client size (*SIZE*) since large firms are more likely to face higher agency costs and because specialist auditor are better equipped to efficiently conduct the audit of large clients. Prior literature argues that the propensity to generate accruals, information asymmetry, and opportunities for managers to expropriate capital provided by other stakeholders are three conditions positively associated with the choice of an industry specialist auditor (Ettredge et al., 2009). I include capital intensity (*CAPINT*) and the operating cycle (*LCYC*) to proxy for the propensity to generate accruals (e.g. Francis et al. 1999). The authors argue that firms with longer operating cycles will generate a greater amount of short-term accruals, and that firms with greater capital intensity would generate more long-term accruals. They show that firms with greater propensity to generate accruals are more likely to hire a Big 4 auditor.

I also control for growth opportunities by including a variable measuring a significant issuance of stock (*ISS*). As explained in Francis et al. (1999), firms with growth opportunities are more likely to issue capital, and firms issuing capital demand higher quality audits (e.g. Beatty 1989). I include the price-earnings ratio (*PE*) for the same purpose (to control for growth opportunities).

I add client financial leverage (*LEV*) and losses (*LOSS*) to control for financial distress since lenders and shareholders of client firms with severe financial conditions may demand an industry specialist auditor I add asset turnover (*ATURN*), which captures transaction complexity and thus is expected to be positively associated with the choice of an expert (e.g. Chaney et al. 2004). I include current assets as a percentage of total assets (*CURR*) because the audits of receivables and inventory would require specific industry-related audit procedure. I expect both variables to be positively associated with the choice of an industry specialist auditor. Following Mascarenhas et al. (2010), I add the number of employees (*EMP*). I also add a variable indicating membership in regulated industry (*REGIND*), since prior literature shows that members of regulated industries are more likely to use specialist auditors (e.g. Francis et al., 1999 and Godfrey and Hamilton 2005). Finally, I include *RD* expense because Godfrey and Hamilton (2005) show that R&D intensity is positively correlated with use of an industry specialist.

3.5. Sample and data

The samples selection procedure is described in Table 2.2. Data is collected from the intersection of COMPUSTAT and Audit Analytics. I exclude observations with missing auditor data and further exclude firm-year observations where an auditor change occurs. I limit the sample to the period after 2003 (post-SOX period) to eliminate potential confounding effects of the legal and regulatory changes on the auditing industry. I further eliminate observations with deviant residuals higher than '2.5' in absolute value.The final sample consists of 27,409 firm-year observations representing 6,615 unique firms and 559 unique auditors.

4. Empirical findings.

4.1. Descriptive statistics and univariate analysis.

Table 2.3 presents descriptive statistics for the full sample (Panel A), then separately for the auditor specialization and the non-specialization sub-samples respectively, for each of the independent variables used in my primary analyses (Panel B). Panel C shows the results of the tests of differences in the means in the independent variables between the auditor specialization and the non-specialization sub-samples.

Overall, Table 2.3 suggests that non-specialization clients have overall a significantly higher level of accrual intensity as captured by the four continuous measures. It also suggests that industry expert clients have a higher than median positive and negative accruals compared to non-industry expert clients. This suggests that accrual intensity may very well play an important role in auditor choice. The tests of differences in the means in Table 2.3 panel C are significant at the 1% level for all of the variables, except for *LCYC* and *ATURN*, which in turn suggests that most of these variables should be included as controls in the empirical model.

Table 2.4 presents the Pearson/Spearman correlation matrix. Other than the correlation between the accrual intensity variables, the correlations between the other variables are not high. Among the highest are the negative correlations between *SIZE* and the accrual intensity variables (around -0.5), and the correlations between *RD* and the accrual intensity variables (around 0.6).

4.2. Multivariate analysis and test of H1 using SPECF1 as the dependent variable.

Table 2.5 presents the results for the main model using *SPECF1* as a dependent variable and *ACINTA_TAC* as the main independent variable measuring accrual intensity. Multicollinearity does not seem to be an issue since the highest VIF value (based on a multivariate OLS regression, unreported) is 3.69, which is well below the threshold of 10. The pseudo-R^2 for the model is around 9.6%, which is slightly higher than that reported in prior literature (around 5%). The results in Table 2.5 show that the variable *ACINTA_TAC* is significant with a negative sign. This suggests that accrual intensity is negatively associated with the choice of an industry-specialist auditor. The log odds of choosing an industry expert decrease by 0.2881 for every one unit increase in *ACINTA_TAC*. This result is inconsistent with my prediction in the first hypothesis H1, and is in line with the audit risk hypothesis: Auditors perceive clients with high accrual intensity as more likely to pose a threat to their industry reputation.

Most results for the control variables are overall consistent with prior literature. The variable *SIZE*, *CAPINT*, *LCYC*, *CUR*, and *RD* are positive and significant, suggesting that client firms that are larger, have higher capital intensity, run higher operating cycles, have a higher current ratio and a higher R&D expenses tend to choose industry experts.
The variables *EMP* and *LEV* are negative and significant, implying that client firms with longer more employees and a higher level of debt tend to hire non-industry experts. The variables *ISS*, *PE*, *REGIND*, *LOSS* and *ATURN* are not significant.

Table 2.6 reports the results from essentially the same model with different specifications. In Table 2.6, I introduce the other measures of accrual intensity based on short term accruals, on disaggregate accrual accounts, and on dummy variables for positive and negative accruals indicating a value higher than the industry-year median.

Results from Table 2.6 corroborate the findings in Table 2.5. As a matter of fact, the continuous variables *ACINTD_TAC*, *ACINTA_STA*, and *ACINTD_STA* are all consistently negative and significant, confirming that firms with higher accrual intensity are audited by non-industry specialists, which, while inconsistent with my prediction in H1, is in line with the audit risk hypothesis. In addition, the dichotomous variables *HPACC* and *HNACC* are also negative and significant. This result is particularly interesting since it reveals that the sign (or nature) of the accrual accounts does not matter. The effect of the intensity of positive accruals on the log odds is in the same direction as that of the intensity of the negative accruals. The control variables results are qualitatively similar to those reported in Table 2.5 and discussed earlier. All the pseudo-R^2 are around 9.6%.

In sum, the main results suggest that client firms that display a higher level of accrual intensity are not audited by hiring industry-specialist auditors. While the results from different specifications of the main model seem to agree, it might be that these results are idiosyncratic to the auditor specialization measure adopted (*SPECF1*). The next section introduces a battery of sensitivity tests to assess the robustness of the findings reported above.

5. Sensitivity tests.

I first include two other measures of auditor specialization based on audit fees. While the first definition used (*SPECF1*) captures whether the auditor industry leader has a market share that exceeds the second largest auditor's market share by at least 10%, under the second definition, *SPECF2*=1 if the auditor has the largest annual industry market share (e.g., Ettredge et al. 2009); *SPECF2*=0 otherwise. Finally, under the third definition, *SPECF3*=1 if audit firm annual industry market share is 30% or more[12]; *SPECF3*=0 otherwise (e.g. Neal and Riley 2004).

[12] In a Big4 environment, the fair market share for the four largest auditors is ¼=25%. Palmrose (1986) suggests that an auditor can be considered as specialist if the firm holds a market share 20% higher than the fair market share

Results for the *SPECF2* and *SPECF3* specifications are presented in Tables 2.7 and 2.8 respectively. *SPECF2* fairly corroborates prior findings. All continuous accrual intensity variables are negative and significant. However, the dichotomous variables *HPACC* and *HNACC* are now insignificant for this specification. Also, the pseudo-R^2s are slightly lower in the models using *SPECF2* as a dependent variable. Table 2.8 confirms the same conclusions, with the main difference that the dichotomous variable *HNACC* is negative and significant, while *HPACC* is insignificant.

Next, I devise a measure of auditor specification that takes into account the audit firm market share based on client sales. Several studies use this measure especially when audit fees data is unavailable. Untabulated results replicate the findings above, with slightly higher pseudo-R^2 for the *SPECS3* specification (around 10.7%). However, the variables *HPACC* and *HNACC* are insignificant in all the models using clients' sales as basis for the auditor industry expertise measure.

Also, I use an auditor specialization measure based on the number of clients. Francis and Yu (2009) argue that a fee-based measure may be genuinely correlated to client characteristics and risk factors. They suggest that using the number of clients might alleviate these concerns to some extent. Following their suggestion, I use two measures of audit firm industry specialization: *SPECN2* and *SPECN3*. The *SPECN2* measure indicates whether an auditor is an industry leader, while *SPECN3* indicates whether the auditor has an industry share of 30% or higher. Untabulated analyses suggest that while *SPECN3* yields results that are similar to what I have discussed earlier, *SPECN2* results are weaker in power.

(in this case 25%). Thus the 30% threshold I choose (=25% × 1.2). For example, Ettredge et al. (2009) use a threshold of 30% for their sample period 2002-2005.

Lastly, while relatively recent research explores auditor specialization for non-big 4 auditors (e.g. Meyer 2009), most auditor specialization studies use data from big 4 auditors and their clients. I therefore restrict my sample to the 19,672 firm-year observations relating to the big 4 auditors. Table 2.9 displays the results from this restricted sample. As we can see, the accrual intensity variables are all negative and significant at less than the 1% level, except for the specification using *ACINTD_STA* which loads with a non-significant coefficient.

In the end, sensitivity checks indicate that the results remain overall qualitatively robust to the use of alternative definitions of auditor specialization based on client sales and number of clients, especially for the continuous measures of accrual intensity. Results are also robust to the use of a restricted sample of big 4 clients.

6. Conclusion.

This study investigates whether the intensity of accruals is a factor that influences the decision to hire an industry specialist auditor. Put differently, it tests whether client firms with a high level of accruals tend to be audited by an industry expert. The results suggest that firms displaying high accrual intensity are audited by non-industry-specialist auditors. These results are qualitatively consistent through a battery of robustness checks and to a restricted sample of big 4 audit clients. However, the results are less robust for the two dichotomous variables indicating a higher than average positive and negative accruals.

Overall, these results suggest that companies do not use auditor industry expertise as a means to alleviate the perceived higher agency costs. Potential explanation might be that clients may find it less costly to suffer higher agency costs than to pay a premium fee for industry expertise. In addition, it might be the case that auditors prefer not to audit high accrual firms because they represent a higher audit risk, and that an audit failure might taint their reputation in the industry.

While this study sheds light on some important audit market dynamics, it is subject to a few caveats. Although several specifications of auditor industry expertise are used in the main and the sensitivity tests, the literature on the topic does not seem to agree on one specific measure and the extant measures have their own flaws. In addition, while a great deal of care is employed in choosing control variables, it might be that auditor specialization features may be of an interest to a subsample of firms than other, which brings about the issue of omitted variables associated with accrual intensity. The results above should be interpreted in the light of these caveats.

CHAPTER FOUR: CONCLUSION

In this dissertation, I contribute to the auditing literature by examining some strategies accounting firms undertake to differentiate their services. In the first essay, I look at the whether client firms benefit from hiring auditors with higher reputation. In particular, I investigate the benefit to client firms from the perspective of investors on the financial market place, and whether auditor reputation is associated with investors' perception of the credibility of financial statements. The contribution of this essay to the growing body of auditor reputation literature consists in devising a novel measure of auditor change based on news articles. I analyze this research question by employing two models assessing investors' perception of financial statements credibility: a valuation model using change in earnings response coefficients as a dependent variable, and a cost of capital model using ex ante cost of equity as a dependent variable assessing investors' perceptions.

In the second essay, I study audit firm industry specialization as a means of audit services differentiation. Specifically, I investigate whether client firms with high accrual intensity are audited by industry expert auditors.

The results from the two essays provide evidence that audit firms indeed employ differentiation strategies to market their services. Regarding auditor reputation, the first essay results show that changes in earnings response coefficients are marginally associated with changes in auditor reputation, as measured by a reputation change score derived from the content analysis of news reports. The cost of capital tests provides a stronger and more significant result. Essentially, the results show that a change in auditor reputation is negatively associated with a change in the ex ante cost of equity capital, thus corroborating the idea that client firms audited by firms with higher auditor reputation enjoy a lower cost of capital on the market. From an investor's perspective, these results insinuate that financial statements audited by auditors with higher reputation are more credible and reliable than statements from less reputable accounting firms.

Results from the essay examining industry expertise as a differentiation strategy show that firms with higher accrual intensity are not likely to be audited by industry expert accounting firms. These results can be interpreted as evidence that audit firms are less prone to risk their reputation as industry experts and prefer not to audit high accrual firms.

Future areas of research

Several avenues of future research can extend this dissertation and on the methodology used in parts of it. First of all, while content analysis is slowly finding its way in capital markets research, its use in the auditing areas of accounting research is still at its first steps. Future research can examine auditor characteristics in relation with various types of firm disclosures (for example disclosures contained in audited annual reports). Another extension of the present work may be to investigate how different types of news reports affect auditor reputation. Recent research recognizes newswires as particularly relevant in screening and disseminating value-relevant information in financial markets (Li et al. 2011), so one could specifically examine whether various information media impact audit firm reputation differently.

Table 2.1. Variables definitions.

Variable	Description
Dependent Variables	
SPECF1	=1 if the client's auditor has the largest annual industry market share among all audit firms and that market share exceeds the second largest audit market annual share by at least 10%, =0 otherwise. Audit firm market share is the sum of the audit fees of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total audit fees of all clients (regardless of auditor) in the same industry-year.
SPECF2	=1 if the client's auditor has the largest annual industry market share among all audit firms, =0 otherwise. Audit firm market share is the sum of the audit fees of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total audit fees of all clients (regardless of auditor) in the same industry-year.
SPECF3	=1 if the client's audit firm annual industry market share is 30% or more, =0 otherwise. Audit firm market share is the sum of the sales of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total audit fees of all clients (regardless of auditor) in the same industry-year.
SPECS1	=1 if the client's auditor has the largest annual industry market share among all audit firms and that market share exceeds the second largest audit market annual share by at least 10%, =0 otherwise. Audit firm market share is the sum of the sales of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total sales of all clients (regardless of auditor) in the same industry-year.
SPECS2	=1 if the client's auditor has the largest annual industry market share among all audit firms, =0 otherwise. Audit firm market share is the sum of the sales of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total sales of all clients (regardless of auditor) in the same industry-year.
SPECS3	=1 if the client's audit firm annual industry market share is 30% or more, =0 otherwise. Audit firm market share is the sum of the sales of all the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total sales of all clients (regardless of auditor) in the same industry-year.

Table 2.1. Variables definitions (continued).

SPECN2	=1 if the client's auditor has the largest annual industry market share among all audit firms, =0 otherwise. Audit firm market share is the number of the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total number of client firms (regardless of auditor) in the same industry-year.
SPECN3	=1 if the client's audit firm annual industry market share is 30% or more, =0 otherwise. Audit firm market share is the number of the audit firm's clients in a particular industry-year (two-digit SIC code), divided by total number of client firms (regardless of auditor) in the same industry-year.

Table 2.1. Variables definitions (continued).

Test Variables

ACINTA_TAC	Absolute value of total accruals deflated by sales (Compustat SALE), where total accruals equal net income (Compustat IBC+XIDOC) – operating activities net cash flow (Compustat OANCF).
ACINTA_STA	*ACINTA_TAC* plus depreciation (Compustat DPC), deflated by sales (Compustat SALE).
ACINTD_TAC	Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC). *ACINTD_TAC* is deflated by sales (Compustat SALE)
ACINTD_STA	Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), deflated by sales (Compustat SALE).
HPACC	= 1 if income increasing accruals are higher than the industry-year median, 0 otherwise. Income increasing accruals are comprised of increases in current asset operating accounts and decreases in current liability operating accounts. Since Compustat codes increases in current asset accounts as a negative value and decreases in current liability accounts as a negative value, total income increasing accruals = [min(RECCH,0) + min(INVCH,0) + min(APALCH,0) + min(TXACH,0) min(AOLOCH,0)] ×-1, where min(·) is the minimum value function operator that evaluates to the minimum of the two arguments (e.g., min(-1,0) = -1).
HNACC	=1 if total income decreasing accruals are higher than the industry-year median, 0 otherwise. Income decreasing accruals are comprised of decreases in current asset operating accounts, increases in current liability operating accounts, and depreciation expense. Since Compustat codes decreases in current asset accounts as a positive value and increases in current liability accounts as a positive value, total income increasing accruals = [max(RECCH,0) + max(INVCH,0) + max(APALCH,0) + max(TXACH,0) max(AOLOCH,0)+DEPC] , where max(·) is the maximum value function operator that evaluates to the maximum of the two arguments (e.g., min(-1,0) = 0).

Table 2.1. Variables definitions (continued).

Control variables:	
SIZE	Natural logarithm of sales (Compustat SALE) for firm *i* in year t.
CAPINT	Gross property, plant and equipment (Compustat PPEGT), scaled by sales (Compustat SALE) for firm *i* in year *t*.
ISS	= 1 if number of outstanding split-adjusted shares (Compustat CSHO×AJEX) in firm *i* increases by more than 10 percent during year *t*, and 0 otherwise.
LCYC	Length of the operating cycle measured as the natural logarithm of the days sales in inventory plus days sales in receivables for firm *i* in year *t*. Days sales in inventory is calculated as INVT/(SALE/360). Days sales in receivables is RECT/(SALE/360).
PE	The price-earnings ratio for firm *i* in year *t*, calculated as the price (Compustat PRCC_F) divided by basic earnings per share before extraordinary items (Compustat EPSPX).
CUR	Current ratio for firm *i* in year t, calculated as current assets (Compustat ACT) divided by current liabilities (Compustat LCT).
EMP	Square root of the number of employees (Compustat EMP) in firm *i* in year t.
REGIND	= 1 if firm *i* is a member of a regulated industry in year t, and 0 otherwise. The following are considered regulated industries (following Francis et al. 1999): railroad (4011 and 4100), telephone communications (4812 and 4813), electric companies (4911), gas companies (492, 4923, and 4924), personal credit (6141), and insurance (6311).
LOSS	= 1 if net income (Compustat IB) scaled by lagged assets (Compustat AT) for firm *i* in year t is negative and the absolute value of change in net income scaled by lagged assets during year t is greater than 10 percent, and 0 otherwise.
LEV	Leverage, measured by the ratio of total debt (Compustat DLTT + DLC) to total assets (Compustat AT) as of fiscal year-end.
ATURN	Asset turnover for firm *i* in year t, calculated as sales (compustat SALE) divided by total assets (Compustat AT).
RD	R&D intensity, measured as R&D expense (Compustat XRD) to sales (Compustat SALE).

Table 2.2. Sample selection procedure.

Data Step	Observations
Firm-year observations in both Compustat and Audit Analytics for the period 2002-2010	60,235
Firm-year observations with auditor change	−11,070
Firm-year observations with fiscal year-end before 2003	−14,856
Firm-year observations with missing data	−12,104
Observations with absolute value of deviant residuals > 2.5	− 98
Final sample	27,409

Table 2.3 – Descriptive statistics.

Panel A – Full sample (*n* = 27,409)

Variable	Mean	Median	SD	Min	Max
ACINTA_TAC	0.2970	0.0794	0.7021	0.0040	3.6264
ACINTA_STA	0.3974	0.1331	0.8368	0.0199	4.3431
ACINTD_TAC	0.2824	0.1425	0.4322	0.0351	2.2244
ACINTD_STA	0.1861	0.0798	0.3210	0.0124	1.6241
HPACC	0.4729	0	0.4993	0	1
HNACC	0.4993	0	0.5000	0	1
SIZE	5.3407	5.4940	2.5319	-0.3383	10.0142
CAPINT	0.9264	0.4138	1.3062	0.0356	5.9105
ISS	0.1876	0	0.3904	0	1
LCYC	4.3532	4.4412	0.7018	2.4504	5.6878
PE	10.683	11.764	29.103	-65.937	96.764
CUR	2.6206	1.8979	2.2147	0.3036	10.034
EMP	1.7571	0.9685	2.0121	0.0837	8.3785
REGIND	0.0468	0	0.2113	0	1
LOSS	0.1938	0	0.3953	0	1
LEV	0.2277	0.1706	0.2436	0	0.9942
ATURN	1.0412	0.8608	0.7545	0.0730	3.2328
RD	0.1594	0.0017	0.4706	0	2.4582

Notes: Please see Table 2.1 for variable definitions.

Table 2.3 – Descriptive statistics (continued).

Panel B – Comparative descriptive statistics between auditor specialization and non-specialization sub-samples.

	Non auditor specialization sample (n = 24,208)					Auditor specialization sample (n = 3,201)				
Variable	Mean	Med	SD	Min	Max	Mean	Med	SD	Min	Max
ACINTA_TAC	0.32	0.08	0.73	0.00	3.63	0.16	0.06	0.41	0.00	3.63
ACINTA_STA	0.42	0.14	0.87	0.02	4.34	0.23	0.12	0.49	0.02	4.34
ACINTD_TAC	0.29	0.15	0.45	0.04	2.22	0.19	0.12	0.28	0.04	2.22
ACINTD_STA	0.20	0.08	0.33	0.01	1.62	0.11	0.06	0.21	0.01	1.62
HPACC	0.45	0.00	0.50	0.00	1.00	0.66	1.00	0.47	0.00	1.00
HNACC	0.47	0.00	0.50	0.00	1.00	0.70	1.00	0.46	0.00	1.00
SIZE	5.13	5.27	2.51	-0.34	10.01	6.95	7.04	2.03	-0.34	10.01
CAPINT	0.92	0.40	1.32	0.04	5.91	1.00	0.54	1.17	0.04	5.91
ISS	0.19	0.00	0.40	0.00	1.00	0.14	0.00	0.35	0.00	1.00
LCYC	4.36	4.44	0.71	2.45	5.69	4.34	4.44	0.66	2.45	5.69
PE	10.22	10.90	29.37	-65.94	96.76	14.16	15.00	26.75	-65.94	96.76
CUR	2.65	1.92	2.24	0.30	10.03	2.40	1.74	1.97	0.30	10.03
EMP	1.61	0.87	1.91	0.08	8.38	2.83	2.00	2.40	0.08	8.38
REGIND	0.04	0.00	0.20	0.00	1.00	0.08	0.00	0.27	0.00	1.00
LOSS	0.21	0.00	0.40	0.00	1.00	0.10	0.00	0.30	0.00	1.00
LEV	0.23	0.16	0.25	0.00	0.99	0.24	0.23	0.20	0.00	0.99
ATURN	1.04	0.86	0.76	0.07	3.23	1.03	0.86	0.70	0.07	3.23
RD	0.17	0.00	0.48	0.00	2.46	0.11	0.00	0.41	0.00	2.46

Notes: Auditor specialization is measured using the variable *SPECF1*. Please refer to Table 2.1 for variable definitions.

Table 2.3 – Descriptive statistics (continued).

Panel C – Tests of differences in the means in the independent variables by *SPECF1*, *n* = 27,409

Variable	Mean Diff	SD	Std Error	t-value	Pr > |t|
ACINTA_TAC	0.1559	0.7004	0.0132	11.835	<.0001
ACINTA_STA	0.1862	0.8347	0.0157	11.860	<.0001
ACINTD_TAC	0.1064	0.4308	0.0081	13.137	<.0001
ACINTD_STA	0.0812	0.3199	0.0060	13.496	<.0001
HPACC	-0.2123	0.4946	0.0093	-22.822	<.0001
HNACC	-0.2267	0.4947	0.0093	-24.365	<.0001
SIZE	-1.8256	2.4631	0.0463	-39.409	<.0001
CAPINT	-0.0817	1.3059	0.0246	-3.3255	.0009
ISS	0.0561	0.3900	0.0073	7.6494	<.0001
LCYC	0.0192	0.7018	0.0132	1.4527	0.1463
PE	-3.9325	29.076	0.5468	-7.1912	<.0001
CUR	0.2473	2.2133	0.0416	5.9419	<.0001
EMP	-1.2203	1.9736	0.0371	-32.876	<.0001
REGIND	-0.0368	0.2110	0.0040	-9.2747	<.0001
LOSS	0.1083	0.3937	0.0074	14.628	<.0001
LEV	-0.0150	0.2435	0.0046	-3.2824	0.0010
ATURN	0.0148	0.7545	0.0142	1.0404	0.2982
RD	0.0542	0.4703	0.0088	6.1249	<.0001

Notes: Differences are calculated as Mean(Non-specialization) – Mean(Specialization). Test statistics are calculated assuming equal variances.

Table 2.4. Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	*ACINTA_TAC*	1.00	**0.95**	**0.64**	**0.43**	**-0.22**	**-0.07**	**-0.35**	**0.38**	**0.20**	-0.01	**-0.31**	**-0.08**	**-0.34**	**0.10**	**0.38**	**0.09**	**-0.54**	**0.22**
2	*ACINTA_STA*	**0.99**	1.00	**0.72**	**0.43**	**-0.19**	**-0.04**	**-0.34**	**0.51**	**0.20**	**-0.01**	**-0.31**	**-0.09**	**-0.32**	**0.13**	**0.37**	**0.12**	**-0.64**	**0.23**
3	*ACINTD_TAC*	**0.83**	**0.85**	1.00	**0.85**	**-0.08**	**-0.11**	**-0.48**	**0.38**	**0.24**	**0.23**	**-0.29**	**0.04**	**-0.48**	**0.07**	**0.34**	**-0.01**	**-0.60**	**0.32**
4	*ACINTD_STA*	**0.78**	**0.78**	**0.96**	1.00	**-0.07**	**-0.20**	**-0.54**	**0.08**	**0.24**	**0.36**	**-0.27**	**0.15**	**-0.53**	**-0.09**	**0.34**	**-0.15**	**-0.37**	**0.37**
5	*HPACC*	**-0.22**	**-0.22**	**-0.17**	**-0.16**	1.00	**0.61**	**0.61**	**-0.01**	**-0.12**	**0.07**	**0.21**	**-0.03**	**0.57**	**0.05**	**-0.21**	**0.08**	0.01	**-0.04**
6	*HNACC*	**-0.17**	**-0.16**	**-0.17**	**-0.19**	**0.61**	1.00	**0.69**	**0.07**	**-0.15**	**-0.02**	**0.21**	**-0.09**	**0.65**	**0.06**	**-0.20**	**0.13**	**-0.05**	**-0.02**
7	*SIZE*	**-0.49**	**-0.49**	**-0.54**	**-0.55**	**0.59**	**0.66**	1.00	0.01	**-0.26**	**-0.14**	**0.34**	**-0.19**	**0.91**	**0.18**	**-0.39**	**0.21**	**0.18**	**-0.31**
8	*CAPINT*	**0.46**	**0.51**	**0.50**	**0.38**	**-0.10**	**-0.05**	**-0.18**	1.00	**0.04**	-0.01	**-0.09**	**-0.13**	**0.03**	**0.24**	**0.03**	**0.26**	**-0.54**	**-0.03**
9	*ISS*	**0.22**	**0.23**	**0.24**	**0.23**	**-0.12**	**-0.15**	**-0.27**	**0.13**	1.00	**0.03**	**-0.18**	**-0.03**	**-0.25**	**-0.03**	**0.26**	**0.03**	**-0.17**	**0.11**
10	*LCYC*	**0.12**	**0.12**	**0.21**	**0.25**	**0.08**	0.00	**-0.12**	0.00	**0.02**	1.00	**-0.04**	**0.29**	**-0.10**	**-0.13**	**0.05**	**-0.10**	**-0.17**	**0.30**
11	*PE*	**-0.17**	**-0.17**	**-0.19**	**-0.18**	**0.14**	**0.14**	**0.22**	**-0.08**	**-0.11**	**-0.02**	1.00	**0.05**	**0.32**	**0.04**	**-0.48**	**-0.07**	**0.09**	**-0.15**
12	*CUR*	**0.08**	**0.08**	**0.13**	**0.15**	**-0.11**	**-0.16**	**-0.27**	**-0.02**	**0.02**	**0.19**	0.00	1.00	**-0.17**	**-0.19**	**-0.08**	**-0.53**	**-0.14**	**0.33**
13	*EMP*	**-0.22**	**-0.22**	**-0.27**	**-0.28**	**0.46**	**0.53**	**0.76**	**-0.08**	**-0.19**	**-0.09**	**0.14**	**-0.26**	1.00	**0.12**	**-0.36**	**0.18**	**0.18**	**-0.27**
14	*REGIND*	**-0.03**	**-0.01**	**-0.03**	**-0.06**	**0.05**	**0.06**	**0.17**	**0.21**	**-0.03**	**-0.09**	**0.03**	**-0.14**	**0.11**	1.00	**-0.07**	**0.17**	**-0.14**	**-0.18**
15	*LOSS*	**0.35**	**0.35**	**0.34**	**0.34**	**-0.21**	**-0.20**	**-0.41**	**0.08**	**0.26**	**0.04**	**-0.35**	**-0.01**	**-0.25**	**-0.07**	1.00	**0.03**	**-0.08**	**0.23**
16	*LEV*	**0.15**	**0.15**	**0.10**	**0.07**	-0.01	**0.03**	**0.02**	**0.19**	**0.06**	**-0.12**	**-0.08**	**-0.39**	**0.05**	**0.14**	**0.11**	1.00	**-0.02**	**-0.29**
17	*ATURN*	**-0.30**	**-0.33**	**-0.37**	**-0.30**	**-0.04**	**-0.09**	**0.14**	**-0.46**	**-0.12**	**-0.23**	**0.03**	**-0.24**	**0.08**	**-0.12**	**-0.04**	0.00	1.00	**-0.27**
18	*RD*	**0.57**	**0.59**	**0.65**	**0.63**	**-0.15**	**-0.13**	**-0.42**	**0.31**	**0.20**	**0.12**	**-0.15**	**0.27**	**-0.21**	**-0.07**	**0.28**	**-0.03**	**-0.29**	1.00

Notes: Bold text indicates significance at the 5% level or better.
Pearson (Spearman) correlations are displayed in the left-hand (right-hand) side of the table.

Table 2.5. Multivariate analysis and test of *H1* using *SPECF1* as the dependent variable and *ACINTA_TAC* as test variable.

$$Prob_{(SPECF1=1)} = 1/[1+Exp(-\beta_0 - \beta_1\,ACINT - \beta_2\,SIZE - \beta_3\,CAPINT - \beta_4\,ISS - \beta_5\,LCYC - \beta_6\,PE - \beta_7\,CUR - \beta_8\,EMP - \beta_9\,REGIND - \beta_{10}\,LOSS - \beta_{11}\,LEV - \beta_{12}\,ATURN - \beta_{13}\,RD)]$$

Variable	Exp. sign	Coefficient	Robust SE	Z	Pr > ChiSq
Intercept	?	-5.5148***	0.2004	-27.51	0.0000
ACINTA_TAC	+	-0.2881***	0.0725	-3.97	0.0000
SIZE	+	0.4659***	0.0158	29.41	0.0000
CAPINT	+	0.1694***	0.0192	8.8	0.0000
ISS	+	0.0440	0.0578	0.76	0.4460
LCYC	+	0.0840**	0.0342	2.46	0.0140
PE	+	0.0000	0.0007	-0.03	0.9780
CUR	+	0.0769***	0.0115	6.67	0.0000
EMP	+	-0.0804***	0.0135	-5.95	0.0000
REGIND	+	-0.1220	0.0835	-1.46	0.1440
LOSS	−	-0.0854	0.0716	-1.19	0.2330
LEV	−	0.1748*	0.0984	1.78	0.0760
ATURN	−	0.0357	0.0316	1.13	0.2590
RD	+	0.7173***	0.0662	10.83	0.0000
N	27,409				
Pseudo R^2	0.0959				

* $p < .10$, ** $p < .05$, *** $p < .01$
Reported significance levels are based on two-tailed tests.

Notes: The model is estimated as a logit binary choice model by maximum likelihood from a dataset that pools firm-year observations over the period 2003-2010. Statistical inferences are based on White (1980) heteroskedasticity-adjusted robust variance estimates.

The dependent variable *SPECF*1* is the unobserved net benefit from choosing an industry specialist auditor, observed as *SPECF1*=1 if the auditor with the highest annual industry market share exceeds the second largest annual industry market share by at least 10%; *SPECF1*=0 otherwise.

The accrual intensity test variable is *ACINTA_TAC*. *ACCINTA_TAC* is the absolute value of total accruals, where total accruals equal net income (Compustat IBC + XIDOC) – operating activities net cash flow (Compustat OANCF). *ACCINTA_TAC* is deflated by Compustat SALE.

Please refer to Table 2.1 for operational definitions of all other variables.

Table 2.6. Multivariate analysis and test of *H1* using *SPECF1* as the dependent variable and other test variables.

$$Prob_{(SPECF1=1)} = 1/[1+Exp(-\beta_0 - \beta_1\,ACINT - \beta_2\,SIZE - \beta_3\,CAPINT - \beta_4\,ISS - \beta_5\,LCYC - \beta_6\,PE - \beta_7\,CUR - \beta_8\,EMP - \beta_9\,REGIND - \beta_{10}\,LOSS - \beta_{11}\,LEV - \beta_{12}\,ATURN - \beta_{13}\,RD)]$$

	Expected sign	Accrual intensity based on:				
		Total Accruals	Short-term Accruals		Income Incr/Decr. Separated	
		ACINTD_TAC	*ACINTA_STA*	*ACINTD_STA*	*HPACC*	*HNACC*
Intercept	?	-5.519***	-5.499***	-5.542***	-5.633***	-5.649***
		(-27.43)	(-27.36)	(-27.72)	(-27.74)	(-28.16)
ACINTD_TAC	+	-0.627***				
		(-4.81)				
ACINTA_STA	+		-0.355***			
			(-5.08)			
ACINTD_STA	+			-0.291**		
				(-2.05)		
HPACC	+				-0.131***	
					(-2.58)	
HNACC	+					-0.299***
						(-5.05)
SIZE	+	0.459***	0.462***	0.470***	0.498***	0.529***
		(28.55)	(29.12)	(29.24)	(28.67)	(28.13)
CAPINT	+	0.187***	0.196***	0.146***	0.136***	0.135***
		(9.02)	(9.49)	(7.94)	(7.62)	(7.54)
ISS	+	0.055	0.043	0.050	0.048	0.033
		(0.95)	(0.75)	(0.86)	(0.83)	(0.57)
LCYC	+	0.110***	0.087**	0.091***	0.089***	0.083**
		(3.10)	(2.55)	(2.58)	(2.58)	(2.44)
PE	+	-0.000	-0.000	-0.000	-0.000	0.000
		(-0.12)	(-0.03)	(-0.08)	(-0.02)	(0.06)
CUR	+	0.076***	0.076***	0.078***	0.080***	0.077***
		(6.57)	(6.57)	(6.83)	(7.05)	(6.76)
EMP	+	-0.080***	-0.078***	-0.084***	-0.089***	-0.093***
		(-5.94)	(-5.79)	(-6.21)	(-6.60)	(-6.85)
REGIND	+	-0.117	-0.128	-0.110	-0.124	-0.166**
		(-1.40)	(-1.54)	(-1.32)	(-1.49)	(-1.99)
LOSS	−	-0.108	-0.067	-0.131*	-0.137*	-0.118*
		(-1.52)	(-0.94)	(-1.84)	(-1.93)	(-1.67)

Table 2.6. Multivariate analysis and test of *H1* using *SPECF1* as the dependent variable and other test variables (continued).

LEV	−	0.157	0.186*	0.149	0.148	0.148
		(1.59)	(1.88)	(1.51)	(1.50)	(1.50)
ATURN	−	0.030	0.035	0.034	0.024	-0.007
		(0.93)	(1.09)	(1.07)	(0.76)	(-0.20)
RD	+	0.820***	0.784***	0.663***	0.589***	0.630***
		(11.08)	(11.63)	(9.18)	(9.93)	(10.53)
N	27,409	27,409	27,409	27,409	27,409	27,409
Pseudo R^2	0.096	0.096	0.097	0.095	0.095	0.096

t statistics in parentheses below coefficient estimates. Reported significance levels are based on two-tailed tests.
* $p < .10$, ** $p < .05$, *** $p < .01$

The model is estimated as a logit binary choice model by maximum likelihood from a dataset that pools firm-year observations over the period 2003-2010. Statistical inferences are based on White (1980) heteroskedasticity-adjusted robust variance estimates. The continuous variables are winsorized at 3%.

The dependent variable *SPECF*1* is the unobserved net benefit from choosing an industry specialist auditor, observed as *SPECF1*=1 if the auditor with the highest annual industry market share exceeds the second largest annual industry market share by at least 10%; *SPECF1*=0 otherwise.

ACINT represents the variable measuring accrual intensity for each model. The accrual intensity test variables are *ACINTA_TAC*, *ACINTA_STA*, *ACINTD_TAC*, *ACINTD_STA*, and *HPACC*/*HNACC*.

ACCINTA_TAC is the absolute value of total accruals, where total accruals equal net income (Compustat IBC + XIDOC) – operating activities net cash flow (Compustat OANCF). *ACINTA_STA* is *ACINTA_TAC* plus depreciation (Compustat DPC). *ACINTD_TAC* is sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC). Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), deflated by sales (Compustat SALE).

HPACC = 1 if income increasing accruals are higher than the industry-year median, 0 otherwise. Income increasing accruals are comprised of increases in current asset operating accounts and decreases in current liability operating accounts. Since Compustat codes increases in current asset accounts as a negative value and decreases in current liability accounts as a negative value, total income increasing accruals = [min(RECCH,0) + min(INVCH,0) + min(APALCH,0) + min(TXACH,0) + min(AOLOCH,0)] × (-1), where min(·) is the minimum value function operator that evaluates to the minimum of the two arguments (e.g., min(-1,0) = -1). *HNACC*=1 if total income decreasing accruals are higher than the industry-year median, 0 otherwise. Income decreasing accruals are comprised of decreases in current asset operating accounts, increases in current liability operating accounts, and depreciation expense. Since Compustat codes decreases in current asset accounts as a positive value and increases in current liability accounts as a positive value, total income increasing accruals = [max(RECCH,0) + max(INVCH,0) + max(APALCH,0) + max(TXACH,0) + max(AOLOCH,0) + DEPC] , where max(·) is the maximum value function operator that evaluates to the maximum of the two arguments (e.g., min(-1,0) = 0).

Please refer to Table 2.1 for operational definitions of all other variables.

Table 2.7. Multivariate analysis and test of *H1* using *SPECF2* as the dependent variable.

$$Prob_{(SPECF2=1)} = 1/[1+Exp(-\beta_0 - \beta_1\, ACINT - \beta_2\, SIZE - \beta_3\, CAPINT - \beta_4\, ISS - \beta_5\, LCYC - \beta_6\, PE - \beta_7\, CUR - \beta_8\, EMP - \beta_9\, REGIND - \beta_{10}\, LOSS - \beta_{11}\, LEV - \beta_{12}\, ATURN - \beta_{13}\, RD)]$$

	Expected sign	Accrual intensity based on: Total Accruals		Short-term Accruals		Income Incr/Decr. Separated	
		ACINTA_TAC	*ACINTD_TAC*	*ACINTA_STA*	*ACINTD_STA*	*HPACC*	*HNACC*
Intercept	?	-3.032***	-3.037***	-3.024***	-3.054***	-3.031***	-3.071***
		(-20.84)	(-20.93)	(-20.77)	(-21.08)	(-20.70)	(-21.16)
ACINTA_TAC	+	-0.165***					
		(-3.39)					
ACINTD_TAC	+		-0.251***				
			(-2.91)				
ACINTA_STA	+			-0.160***			
				(-3.68)			
ACINTD_STA	+				-0.237**		
					(-2.35)		
HPACC	+					0.040	
						(1.00)	
HNACC	+						-0.038
							(-0.84)
SIZE	+	0.385***	0.384***	0.384***	0.386***	0.387***	0.400***
		(31.52)	(31.27)	(31.43)	(31.36)	(29.23)	(28.32)
CAPINT	+	0.023	0.025	0.031*	0.011	0.006	0.005
		(1.40)	(1.44)	(1.83)	(0.71)	(0.39)	(0.30)
ISS	+	-0.051	-0.046	-0.051	-0.047	-0.052	-0.052
		(-1.13)	(-1.03)	(-1.13)	(-1.04)	(-1.16)	(-1.16)
LCYC	+	-0.061**	-0.051**	-0.060**	-0.052**	-0.069***	-0.065***
		(-2.48)	(-2.05)	(-2.46)	(-2.08)	(-2.82)	(-2.65)
PE	+	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(-0.67)	(-0.74)	(-0.67)	(-0.73)	(-0.74)	(-0.70)
CUR	+	0.032***	0.032***	0.031***	0.032***	0.034***	0.033***
		(3.59)	(3.58)	(3.56)	(3.65)	(3.84)	(3.80)
EMP	+	-0.062***	-0.063***	-0.061***	-0.064***	-0.066***	-0.067***
		(-5.46)	(-5.56)	(-5.41)	(-5.64)	(-5.84)	(-5.96)
REGIND	+	0.011	0.016	0.010	0.017	0.023	0.011
		(0.16)	(0.22)	(0.14)	(0.24)	(0.33)	(0.15)

Table 2.7. Multivariate analysis and test of *H1* using *SPECF2* as the dependent variable (continued).

LOSS	−	-0.000	-0.017	0.002	-0.023	-0.033	-0.029
		(-0.01)	(-0.33)	(0.04)	(-0.45)	(-0.64)	(-0.56)
LEV	−	-0.206***	-0.219***	-0.203**	-0.224***	-0.223***	-0.225***
		(-2.61)	(-2.77)	(-2.57)	(-2.84)	(-2.84)	(-2.86)
ATURN	−	-0.182***	-0.186***	-0.184***	-0.183***	-0.179***	-0.187***
		(-6.89)	(-7.01)	(-6.93)	(-6.92)	(-6.76)	(-6.92)
RD	+	0.538***	0.552***	0.551***	0.524***	0.449***	0.461***
		(10.68)	(10.01)	(10.74)	(9.98)	(10.08)	(10.27)
N		27,409	27,409	27,409	27,409	27,409	27,409
Pseudo R^2		0.0843	0.0842	0.0844	0.0841	0.0839	0.0839

t statistics in parentheses below coefficient estimates. Reported significance levels are based on two-tailed tests.
* $p < .10$, ** $p < .05$, *** $p < .01$

The model is estimated as a logit binary choice model by maximum likelihood from a dataset that pools firm-year observations over the period 2003-2010. Statistical inferences are based on White (1980) heteroskedasticity-adjusted robust variance estimates. The continuous variables are winsorized at 3%.

The dependent variable *SPECF*2* is the unobserved net benefit from choosing an industry specialist auditor, observed as *SPECF2*=1 if the auditor with the highest annual industry market share; *SPECF2*=0 otherwise.

ACINT represents the variable measuring accrual intensity for each model. The accrual intensity test variables are *ACINTA_TAC*, *ACINTA_STA*, *ACINTD_TAC*, *ACINTD_STA*, and *HPACC*/*HNACC*.

ACCINTA_TAC is the absolute value of total accruals, where total accruals equal net income (Compustat IBC + XIDOC) – operating activities net cash flow (Compustat OANCF). *ACINTA_STA* is *ACINTA_TAC* plus depreciation (Compustat DPC). *ACINTD_TAC* is sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC). Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), deflated by sales (Compustat SALE).

HPACC = 1 if income increasing accruals are higher than the industry-year median, 0 otherwise. Income increasing accruals are comprised of increases in current asset operating accounts and decreases in current liability operating accounts. Since Compustat codes increases in current asset accounts as a negative value and decreases in current liability accounts as a negative value, total income increasing accruals = [min(RECCH,0) + min(INVCH,0) + min(APALCH,0) + min(TXACH,0) + min(AOLOCH,0)] × (-1), where min(·) is the minimum value function operator that evaluates to the minimum of the two arguments (e.g., min(-1,0) = -1). *HNACC*=1 if total income decreasing accruals are higher than the industry-year median, 0 otherwise. Income decreasing accruals are comprised of decreases in current asset operating accounts, increases in current liability operating accounts, and depreciation expense. Since Compustat codes decreases in current asset accounts as a positive value and increases in current liability accounts as a positive value, total income increasing accruals = [max(RECCH,0) + max(INVCH,0) + max(APALCH,0) + max(TXACH,0) + max(AOLOCH,0) + DEPC] , where max(·) is the maximum value function operator that evaluates to the maximum of the two arguments (e.g., min(-1,0) = 0).

Please refer to Table 2.1 for operational definitions of all other variables.

Table 2.8. Multivariate analysis and test of *H1* using *SPECF3* as the dependent variable.

$$Prob_{(SPECF3=1)} = 1/[1+Exp(-\beta_0 - \beta_1\, ACINT - \beta_2\, SIZE - \beta_3\, CAPINT - \beta_4\, ISS - \beta_5\, LCYC - \beta_6\, PE - \beta_7\, CUR - \beta_8\, EMP - \beta_9\, REGIND - \beta_{10}\, LOSS - \beta_{11}\, LEV - \beta_{12}\, ATURN - \beta_{13}\, RD)]$$

	Expected sign	Accrual intensity based on:					
		Total Accruals		Short-term Accruals		Income Incr/Decr. Separated	
		ACINTA_TAC	*ACINTD_TAC*	*ACINTA_STA*	*ACINTD_STA*	*HPACC*	*HNACC*
Intercept	?	-3.626***	-3.631***	-3.615***	-3.653***	-3.679***	-3.730***
		(-24.95)	(-25.00)	(-24.84)	(-25.22)	(-25.02)	(-25.62)
ACINTA_TAC	+	-0.242***					
		(-4.55)					
ACINTD_TAC	+		-0.378***				
			(-4.01)				
ACINTA_STA	+			-0.249***			
				(-5.12)			
ACINTD_STA	+				-0.245**		
					(-2.32)		
HPACC	+					-0.034	
						(-0.87)	
HNACC	+						-0.201***
							(-4.52)
SIZE	+	0.409***	0.407***	0.407***	0.413***	0.426***	0.456***
		(33.40)	(33.05)	(33.26)	(33.38)	(31.94)	(31.81)
CAPINT	+	0.133***	0.136***	0.148***	0.113***	0.105***	0.103***
		(8.25)	(8.07)	(8.66)	(7.42)	(7.11)	(6.99)
ISS	+	-0.024	-0.017	-0.024	-0.020	-0.024	-0.031
		(-0.55)	(-0.38)	(-0.55)	(-0.45)	(-0.53)	(-0.70)
LCYC	+	-0.012	0.002	-0.011	-0.006	-0.016	-0.015
		(-0.48)	(0.10)	(-0.43)	(-0.22)	(-0.65)	(-0.59)
PE	+	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(-0.28)	(-0.38)	(-0.28)	(-0.35)	(-0.32)	(-0.22)
CUR	+	0.041***	0.041***	0.041***	0.042***	0.044***	0.042***
		(4.57)	(4.55)	(4.52)	(4.72)	(4.92)	(4.68)
EMP	+	-0.068***	-0.070***	-0.067***	-0.072***	-0.075***	-0.079***
		(-6.07)	(-6.19)	(-5.98)	(-6.40)	(-6.74)	(-6.99)
REGIND	+	0.225***	0.232***	0.223***	0.235***	0.232***	0.196***
		(3.26)	(3.36)	(3.23)	(3.41)	(3.36)	(2.82)

Table 2.8. Multivariate analysis and test of *H1* using *SPECF3* as the dependent variable (continued).

LOSS	−	0.002	-0.023	0.008	-0.036	-0.044	-0.028
		(0.03)	(-0.44)	(0.16)	(-0.69)	(-0.84)	(-0.55)
LEV	−	0.122	0.104	0.128*	0.095	0.094	0.092
		(1.61)	(1.37)	(1.68)	(1.26)	(1.24)	(1.22)
ATURN	−	-0.089***	-0.094***	-0.091***	-0.090***	-0.092***	-0.116***
		(-3.47)	(-3.68)	(-3.54)	(-3.52)	(-3.59)	(-4.45)
RD	+	0.499***	0.525***	0.528***	0.450***	0.381***	0.415***
		(9.46)	(9.01)	(9.78)	(8.16)	(8.27)	(8.94)
N		27,409	27,409	27,409	27,409	27,409	27,409
Pseudo R^2		0.1000	0.1003	0.0993	0.0930	0.0991	0.0999

t statistics in parentheses below coefficient estimates. Reported significance levels are based on two-tailed tests.
* $p < .10$, ** $p < .05$, *** $p < .01$

The model is estimated as a logit binary choice model by maximum likelihood from a dataset that pools firm-year observations over the period 2003-2010. Statistical inferences are based on White (1980) heteroskedasticity-adjusted robust variance estimates. The continuous variables are winsorized at 3%.

The dependent variable *SPECF*3* is the unobserved net benefit from choosing an industry specialist auditor, observed as *SPECF3*=1 if audit firm annual industry market share is 30% or more; *SPECF3*=0 otherwise.

ACINT represents the variable measuring accrual intensity for each model. The accrual intensity test variables are *ACINTA_TAC*, *ACINTA_STA*, *ACINTD_TAC*, *ACINTD_STA*, and *HPACC*/*HNACC*.

ACCINTA_TAC is the absolute value of total accruals, where total accruals equal net income (Compustat IBC + XIDOC) – operating activities net cash flow (Compustat OANCF). *ACINTA_STA* is *ACINTA_TAC* plus depreciation (Compustat DPC). *ACINTD_TAC* is sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC). Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), deflated by sales (Compustat SALE).

HPACC = 1 if income increasing accruals are higher than the industry-year median, 0 otherwise. Income increasing accruals are comprised of increases in current asset operating accounts and decreases in current liability operating accounts. Since Compustat codes increases in current asset accounts as a negative value and decreases in current liability accounts as a negative value, total income increasing accruals = [min(RECCH,0) + min(INVCH,0) + min(APALCH,0) + min(TXACH,0) + min(AOLOCH,0)] × (-1), where min(·) is the minimum value function operator that evaluates to the minimum of the two arguments (e.g., min(-1,0) = -1). *HNACC*=1 if total income decreasing accruals are higher than the industry-year median, 0 otherwise. Income decreasing accruals are comprised of decreases in current asset operating accounts, increases in current liability operating accounts, and depreciation expense. Since Compustat codes decreases in current asset accounts as a positive value and increases in current liability accounts as a positive value, total income increasing accruals = [max(RECCH,0) + max(INVCH,0) + max(APALCH,0) + max(TXACH,0) + max(AOLOCH,0) + DEPC] , where max(·) is the maximum value function operator that evaluates to the maximum of the two arguments (e.g., min(-1,0) = 0).

Please refer to Table 2.1 for operational definitions of all other variables.

Table 2.9. Multivariate analysis and test of *H1* using *SPECF1* as the dependent variable. Sample restricted to Big 4 clients.

$$Prob_{(SPECF1=1)} = 1/[1+Exp(-\beta_0 - \beta_1\,ACINT - \beta_2\,SIZE - \beta_3\,CAPINT - \beta_4\,ISS - \beta_5\,LCYC - \beta_6\,PE - \beta_7\,CUR - \beta_8\,EMP - \beta_9\,REGIND - \beta_{10}\,LOSS - \beta_{11}\,LEV - \beta_{12}\,ATURN - \beta_{13}\,RD)]$$

	Expected sign	Accrual intensity based on:					
		Total Accruals		Short-term Accruals		Income Incr/Decr. Separated	
		ACINTA_TAC	*ACINTD_TAC*	*ACINTA_STA*	*ACINTD_STA*	*HPACC*	*HNACC*
Intercept		-4.467***	-4.468***	-4.455***	-4.473***	-4.612***	-4.621***
		(-21.73)	(-21.64)	(-21.62)	(-21.81)	(-22.03)	(-22.35)
ACINTA_TAC	?	-0.225***					
		(-3.00)					
ACINTD_TAC	?		-0.504***				
			(-3.74)				
ACINTA_STA	?			-0.314***			
				(-4.30)			
ACINTD_STA	?				-0.046		
					(-0.32)		
HPACC	?					-0.190***	
						(-3.91)	
HNACC	?						-0.408***
							(-7.37)
SIZE	+	0.088***	0.086***	0.086***	0.091***	0.097***	0.124***
		(5.92)	(5.79)	(5.81)	(6.11)	(6.16)	(7.56)
CAPINT	+	0.011	0.013	0.018	0.002	0.001	-0.001
		(0.64)	(0.72)	(1.02)	(0.11)	(0.04)	(-0.08)
ISS	+	0.257***	0.252***	0.253***	0.264***	0.294***	0.335***
		(13.45)	(13.04)	(13.18)	(13.77)	(14.47)	(15.65)
LCYC	+	0.172***	0.186***	0.198***	0.148***	0.143***	0.141***
		(8.62)	(8.73)	(9.23)	(7.94)	(7.84)	(7.75)
PE	+	0.079	0.087	0.078	0.081	0.087	0.065
		(1.35)	(1.49)	(1.33)	(1.38)	(1.48)	(1.11)
CUR	+	0.152***	0.171***	0.155***	0.147***	0.166***	0.157***
		(4.34)	(4.77)	(4.44)	(4.13)	(4.71)	(4.52)
EMP	+	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		(-0.52)	(-0.59)	(-0.53)	(-0.54)	(-0.46)	(-0.38)

Table 2.9. Multivariate analysis and test of *H1* using *SPECF1* as the dependent variable. Sample restricted to Big 4 clients (continued).

REGIND	+	0.054***	0.053***	0.054***	0.054***	0.055***	0.049***
		(4.40)	(4.30)	(4.36)	(4.47)	(4.53)	(4.05)
LOSS	−	-0.015	-0.016	-0.013	-0.019	-0.023	-0.028**
		(-1.09)	(-1.09)	(-0.93)	(-1.34)	(-1.63)	(-1.99)
LEV	−	-0.007	-0.003	-0.014	0.004	-0.018	-0.079
		(-0.09)	(-0.04)	(-0.17)	(0.05)	(-0.22)	(-0.96)
ATURN	−	-0.093	-0.108	-0.072	-0.132*	-0.128*	-0.103
		(-1.29)	(-1.51)	(-1.00)	(-1.85)	(-1.80)	(-1.44)
RD	+	0.287***	0.273***	0.299***	0.267***	0.262***	0.261***
		(2.91)	(2.76)	(3.03)	(2.72)	(2.66)	(2.63)
N		19,672	19,672	19,672	19,672	19,672	19,672
Pseudo R^2		0.0341	0.0344	0.0348	0.0335	0.0343	0.0367

t statistics in parentheses below coefficient estimates. Reported significance levels are based on two-tailed tests.
* $p < .10$, ** $p < .05$, *** $p < .01$
The model is estimated as a logit binary choice model by maximum likelihood from a dataset that pools firm-year observations over the period 2003-2010. Statistical inferences are based on White (1980) heteroskedasticity-adjusted robust variance estimates.
The dependent variable *SPECF***1* is the unobserved net benefit from choosing an industry specialist auditor, observed as *SPECF1*=1 if the auditor with the highest annual industry market share exceeds the second largest annual industry market share by at least 10%; *SPECF1*=0 otherwise.
ACINT represents the variable measuring accrual intensity for each model. The accrual intensity test variables are *ACINTA_TAC*, *ACINTA_STA*, *ACINTD_TAC*, *ACINTD_STA*, and *HPACC*/*HNACC*.

ACCINTA_TAC is the absolute value of total accruals, where total accruals equal net income (Compustat IBC + XIDOC) – operating activities net cash flow (Compustat OANCF). *ACINTA_STA* is *ACINTA_TAC* plus depreciation (Compustat DPC). *ACINTD_TAC* is sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), and (6) depreciation and other long-term charges (Compustat DPC). Sum of the absolute value of the following accrual components: (1) change in accounts receivable (Compustat RECCH), (2) change in inventory (Compustat INVCH), (3) change in accounts payable (Compustat APALCH), (4) change in taxes payable (Compustat TXACH), (5) net change in other current assets (Compustat AOLOCH), deflated by sales (Compustat SALE).

HPACC = 1 if income increasing accruals are higher than the industry-year median, 0 otherwise. Income increasing accruals are comprised of increases in current asset operating accounts and decreases in current liability operating accounts. Since Compustat codes increases in current asset accounts as a negative value and decreases in current liability accounts as a negative value, total income increasing accruals = [min(RECCH,0) + min(INVCH,0) + min(APALCH,0) + min(TXACH,0) + min(AOLOCH,0)] × (-1), where min(·) is the minimum value function operator that evaluates to the minimum of the two arguments (e.g., min(-1,0) = -1). *HNACC*=1 if total income decreasing accruals are higher than the industry-year median, 0 otherwise. Income decreasing accruals are comprised of decreases in current asset operating accounts, increases in current liability operating accounts, and depreciation expense. Since Compustat codes decreases in current asset accounts as a positive value and increases in current liability accounts as a positive value, total income increasing accruals = [max(RECCH,0) + max(INVCH,0) + max(APALCH,0) + max(TXACH,0) + max(AOLOCH,0) + DEPC] , where max(·) is the maximum value function operator that evaluates to the maximum of the two arguments (e.g., min(-1,0) = 0).

Please refer to Table 2.1 for operational definitions of all other variables.

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VITA

Wael Aguir was born in Soussa, Tunisia, on October 18th, 1977. He is the son of Fawzia Aguir Sakly and Mahmoud Aguir. Wael has two sisters: Wiem and Iness. Wael graduated in 2000 with a Bachelor's degree in Accounting Studies from the Institut Supérieur de Gestion in Soussa. He then earned a D.E.A. in Accounting in 2002 from the Institut Supérieur de Comptabilité et d'Administration des Entreprises (I.S.C.A.E.) in Tunis, Tunisia. Wael worked for an accounting firm in Soussa, Tunisia for some time before he received a Fulbright scholarship in 2003. Wael then joined the Rawl's College of Business at Texas Tech University where he earned his M.S. in Accounting.

Wael enjoys the outdoors, good music, fine cuisine, and good company. He is an avid fan of the Etoile Sportive du Sahel, and he also supports the Red Raiders and the San Antonio Spurs.