

ARCHIVAL EVIDENCE ON BIAS IN AUDITORS' ASSESSMENT OF CLIENT
RISK AND THE CONSEQUENCES FOR AUDIT FEES AND AUDITOR CHANGES

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DEDICATION

To my dad, William Brian Hallman, who passed away just as I was beginning work on my Ph.D., four years prior to the writing of this dissertation. He was the most intelligent man I have ever met and he continues to inspire me today. I miss him dearly.

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TABLE OF CONTENTS

Acknowledgements.....	ii
List of Tables and Figures.....	iv
Abstract.....	v
Chapter	
1. Introduction.....	1
2. Literature Review and Hypothesis Development	5
3. Research Design.....	10
4. Primary Results.....	21
5. Additional Analysis	27
6. Conclusion	35
References.....	37
Appendix	
A. Variable Definitions.....	31
B. Sample Construction.....	43
Vita.....	58

List of Tables and Figures

Table	Page
1. Descriptive Statistics.....	44
2. Absolute Value of Abnormal Accruals as a Function of Relative Restatement Risk.....	45
3. Propensity to Receive a Going Concern Opinion as a Function of Relative Bankruptcy Risk.....	47
4. Audit Fees as a Function of Relative Restatement and Bankruptcy Risk.....	49
5. Propensity to Switch Auditors as a Function of Relative Restatement and Bankruptcy Risk.....	50
6. Positive and Negative Bias Modeled Separately.....	51
7. Client Outcomes as a Function of Relative Restatement and Bankruptcy Risk.....	52
8. Propensity Score Matching.....	53
9. Cross-sectional Tests.....	54
10. Test of DDAR's Impact on Bias at Deloitte.....	56

Figure	Page
1. Illustrated Example of Risk Bias Calculation.....	57

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Abstract

As part of planning and performing financial statement audits, auditors are required to make judgments regarding client risk. These judgments permeate the audit process, driving decisions regarding client acceptance, audit pricing, the extent of audit testing, and the nature of auditors’ written opinions. Although auditors may aim to assess each client’s risk independently, prior research suggests individuals’ draw on their idiosyncratic experiences and environments for benchmarks against which to contrast the case at hand. These “contrast effects” can result in judgments that deviate from those that would be reached using normative principles and may cause bias in auditors’ assessment of client risk. Consistent with this theory, the archival evidence presented in this paper shows that, after controlling for clients’ *actual* risk levels, auditors perform more (less) conservative audits and charge higher (lower) audit fees when clients *appear* riskier (less risky) in the context of other clients audited by the same practice office. Moreover, clients subject to increased (decreased) conservatism and higher (lower) audit fees due to auditors’ biases are more (less) likely to switch auditors during the following period.

1. INTRODUCTION

For the past several decades researchers have provided robust evidence that individuals' decisions are influenced by contextual information, even when such information is normatively irrelevant. In general, this literature finds that humans abhor forming judgments in a vacuum. We prefer instead to use comparative information whenever possible and often turn to salient reference points in our environments or personal experiences for benchmarks. In other words, "human judgment is context dependent" and, because contextual details often differ from one decision to the next, these judgments exhibit predictable directional biases (Bless and Schwarz 2010, 320).

This paper examines whether auditors' over-rely on contextual information when they evaluate client risk. Auditors are required to evaluate client risk at the beginning of every engagement and must tailor the nature and timing of their audit procedures to the risk level of each client (see the PCAOB's Auditing Standard No. 12). Although auditors may attempt to perform an independent risk assessment for each client, prior work on "contrast effects" in the field of psychology suggests that, when forming judgments, individuals contrast the case at hand with contextual benchmarks. Building on this theory, this paper predicts that an auditor will contrast a target client against other clients in his or her environment when assessing the target client's risk. If the riskiness of these environmental benchmark firms is not representative of the population at large, the auditor's perception of risk may be skewed. In short, auditors may perceive a target firm as riskier when it is surrounded by very safe peers and as safer when it is surrounded by very risky peers.

Recent experimental studies have documented contrast effects in various accounting and finance settings. These settings include investors' reactions to earnings preannouncements (Maletta and Zhang 2012), auditors' judgments in the application of accounting standards (Asay et al. 2015), and auditors' evaluation of internal control quality (Bhattacharjee et al. 2007). Yet none have examined whether this bias affects auditors' perceptions of client risk. There is also a notable lack of archival work on contrast effects which is an important gap in the literature because, despite auditors' proven tendency to succumb to cognitive biases in laboratory experiments, there are numerous mechanisms (such as a strong regulatory environment, standardized audit procedures, multiple level review processes, and other audit quality controls) designed to prevent such bias in practice. Moreover, assuming auditor bias persists despite these countervailing mechanisms, its effect on audit outcomes remains an open question. This last point is consistent with Hogarth (1991, 285), who notes that although "auditors' judgments – like those of other professionals – have been shown to exhibit systematic errors and biases... we don't know the consequences of particular judgmental errors in the auditor's natural ecology". This paper attempts to fill this gap in the literature by providing robust archival evidence on the existence and consequences of contrasting effects in the context of auditors' client risk assessment.

Two types of client risk are chosen for use in this study because of their close link to audit risk. The Public Company Accounting Oversight Board (PCAOB) defines audit risk as "the risk that the auditor expresses an inappropriate audit opinion" (see Auditing Standard 8). In practice, there are (at least) two reasons that an auditor might issue an inappropriate audit opinion. First, the auditor might issue a standard clean opinion when

the client's financial statements contain a material misstatement. Second, the auditor might fail to modify his or her opinion when there is significant doubt about the client's ability to continue as a going concern. These two types of audit risk are driven by two corresponding types of client risk – the risk of a material misstatement and bankruptcy risk – which auditors must evaluate when planning, performing, and pricing their audits.

Using established proxies for misstatement risk [FScore from Dechow et al. (2011)] and bankruptcy risk [Zmijewski's (1984) bankruptcy prediction model], this study creates a series of empirical measures that capture the difference between a client's *actual risk* when considered in the context of the full population and its *apparent risk* when considered in the context of a restricted set of peers which are likely to be most familiar to its auditor. This difference is referred to as "risk bias." Consistent with auditors contrasting the risk of a target client against that of a restricted set of familiar firms, the evidence suggests that, after controlling for actual client risk, auditors adjust both their level of conservatism and the pricing of their audits in response to a client's apparent risk. Client firms' financial statements exhibit lower levels of abnormal accruals and auditors charge higher audit fees when clients appear to have higher levels of misstatement risk. In addition, client firms have a higher likelihood of receiving a going concern opinion and auditors charge higher audit fees when clients appear to have higher levels of bankruptcy risk. Further investigation confirms that these effects apply both to clients which appear more risky than they actually are (i.e. positive risk bias is associated with conservative treatment by auditors) as well as to clients which appear less risky than they actually are (i.e. negative risk bias is associated with lax treatment by auditors). These results are robust to alternative variable definitions and model specifications, as

well as numerous controls and propensity-score matching for client size, office size, actual risk levels, and audit firm size. Moreover, there is no evidence that proxies for risk bias predict negative outcomes over-and-above actual risk levels. That is, misstatement risk bias does not predict actual misstatements and bankruptcy risk bias does not predict actual bankruptcies, indicating that auditors' fixation on apparent risk levels is not justified.

This study also examines the impact of risk bias on client retention. Controlling for actual client risk, the evidence suggests that clients which appear riskier in the context of other clients at their current auditor are more likely to switch to a new auditor during the following period. Krishnan (1994, 200) suggests that auditor switches are triggered by "auditors' use of conservative judgments for some clients." He finds that the threshold for a modified report is lower for some clients than for others, and that clients are more likely to switch auditors when subjected to lower thresholds. DeFond and Subramanyam (1998) examine auditors' enforcement of conservative accruals and come to a similar conclusion. The findings of this paper suggest that risk bias may be one reason for such heterogeneity in auditor conservatism and for the related decision by clients to switch auditors.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

There is a burgeoning literature in the field of cognitive psychology exploring humans' tendency to rely on comparative values when forming judgments (Bless and Schwarz 2010). In general, this literature finds that overreliance on contextual reference points frequently causes predictable directional bias in judgments (Tversky and Kahneman 1974; Epley and Gilovich 2005; Critcher and Gilovich 2008). More specifically, the literature on "contrast effects" finds that individuals will contrast a given stimuli against other contextual stimuli to which they have been recently exposed (Feldman and Lynch 1988). This result is both intuitive and empirically robust. For example, consumers perceive products as less expensive when placed in a high-price context versus a low-price context (Adaval and Monroe 2002). Similar effects have been shown in the context of performance evaluation (Sumer and Knight 1996), product quality (Lynch et al. 1991), and in many other settings (e.g. Stapel et al. 1998; Wedell et al. 1987; Eden 1990).

More recently, contrast effects have been demonstrated using experiments in accounting and finance. Maletta and Zhang (2012) show that investors contrast the earnings preannouncements of peer firms and and Asay et al. (2015) find evidence of a contrasting effect in auditors' selection of accounting standards. Bhattacharjee et al. (2007), whose work is most closely related to this paper, examine contrast effects in auditors' assessment of internal control quality. They note that auditors are often required to make similar control evaluations for multiple clients and, although they may attempt to consider each client independently, theory predicts that other clients' control quality may act as a benchmark against which the quality of a target client's controls are

contrasted. They demonstrate this effect experimentally using two groups of auditors. The first group (Group 1) is given a strong set of controls to evaluate and the second group (Group 2) is given a weak set of controls to evaluate. Both groups are then asked to evaluate a common set of controls. Bhattacharjee et al. find that, consistent with contrast effects, Group 1, which was originally exposed to a set of strong controls, is more likely to evaluate the common set of controls as weak and Group 2, which was originally exposed to a weak set of controls, is more likely to evaluate the common set of controls as strong.

This paper predicts a contrast effect in auditors' assessment of client risk. When assessing risk, auditors may compare a target client to other clients in their environment. If client risk varies across auditors' environments (because, for instance, some audit offices have higher risk client portfolios than others) then contrast theory predicts that auditors' perceptions of client risk will vary predictably as a result. This would cause auditors to perceive clients evaluated in the context of relatively safe firms as riskier than they actually are and clients evaluated in the context of relatively risky firms as safer than they actually are. Moreover, because auditors' perceptions of client risk are an important determinant of how they conduct their audits (Bedard and Johnstone 2004; Mock and Wright 1999; Bell et al. 2001; O'Donnell and Schultz 2005), bias in their perceptions of risk should be observable in audit outcomes.¹ This prediction is stated (in alternative form) as *Hypothesis 1*:

¹ Prior research finds that auditors react to perceived client risk by increasing their levels of conservatism. For example, Cahan and Zhang (2006) suggest that, following the demise of Arthur Andersen, the remaining Big-5 auditors viewed the financial statements of ex-Andersen clients as less credible and as having a higher risk of misstatement. As a result of this heightened perception of misstatement risk, Cahan and Zhang hypothesize (and show) that ex-Andersen clients were treated with additional conservatism by their successor auditors. Specifically, they show that ex-Andersen clients exhibited significant decreases in

Hypothesis 1: Controlling for actual risk, clients that appear more (less) risky in the context of other clients in the environment are treated more (less) conservatively by their auditor.

The increase in risk bias predicted by *Hypothesis 1* is also likely to affect audit pricing. Prior work suggests that, in addition to increasing their levels of conservatism, auditors respond to heightened levels of perceived client risk by increasing both audit effort and billing rates relative to clients with lower perceived risk (Bedard and Johnstone 2004). Thus one consequence of contrast effects in auditors' assessment of client risk would be higher (lower) total audit fees for clients that appear more (less) risky than they actually are. This leads to Hypothesis 2, stated in alternative form:

Hypothesis 2: Controlling for actual risk, clients that appear more (less) risky in the context of other clients in the environment are charged higher (lower) audit fees by their auditor.

Hypotheses 1 and 2 predict that bias in auditors' assessment of risk results in some (positive risk bias) clients being treated with high levels of conservatism and being charged high audit fees, while other (negative risk bias) clients are treated with low levels of conservatism and are charged lower fees. Krishnan (1994) suggests that this is precisely the sort of idiosyncratic treatment which triggers some client firms to switch auditors. Several studies find that clients are more likely to switch auditors after receiving a going concern opinion, which is one manifestation of auditor conservatism (Lennox 2000; Chan et al. 2006). DeFond and Subramanyam (1998) discover a similar effect in the context of auditors that enforce the conservative use of accruals. Thus, clients subject to positive risk bias by their current auditor may be more likely to switch auditors in the

abnormal accruals during their first year with a new auditor, relative to clients who were never audited by Andersen.

future, while clients subject to negative risk bias may be less likely to switch. This prediction is stated (in alternative form) as *Hypothesis 3*:

Hypothesis 3: Controlling for actual risk, clients that appear more (less) risky in the context of other clients in the environment are more (less) likely to switch auditors.

The preceding discussion notwithstanding, there are several reasons why the contrast effects documented by previous experimental work may not be observed in an archival investigation of auditors' client risk assessment. First, practicing auditors face a unique regulatory environment. Since 2002 the PCAOB has had both inspection and disciplinary authority over public company auditors, and has implemented standards intended to systematize auditors' assessment of client risk. Auditing Standard No. 12 dictates six steps that all public company auditors must take as part of their risk assessment procedures.² In addition, some firms have implemented proprietary tools designed to further standardize the assessment of client risk. For instance, following Deloitte's failed audit of Adelphia – a particularly risky client – and the related issuance of Accounting and Auditing Enforcement Release No. 2237 by the Securities and Exchange Commission, "Deloitte now uses a proprietary financial analysis tool ('Deloitte Radar' or 'DDAR') to assist in its assessment of substantially all of its U.S. public company clients with publicly traded equity securities as to their potential for financial

² The risk assessment procedures listed in Auditing Standard No. 12 include: (1) obtaining an understanding of the company and its environment; (2) obtaining an understanding of internal control over financial reporting; (3) considering information from the client acceptance and retention evaluation, audit planning activities, past audits, and other engagements performed for the company; (4) performing analytical procedures; (5) conducting a discussion among engagement team members regarding the risks of material misstatement; and (6) inquiring of the audit committee, management, and others within the company about the risks of material misstatement.

statement fraud or business failure. This information is used by Deloitte in planning its risk-based audit procedures” (US Securities and Exchange Commission, 2005, page 12).³

In addition to the countervailing effects of a strong regulator and formal risk benchmarking procedures, auditor specialization may compensate for a general cognitive bias. Auditors often become specialists in specific tasks or for particular types of clients. Some research suggests that subject matter expertise may mitigate cognitive biases. The impact of expertise on cognitive biases is a matter debated in the literature, but one which is particularly important when examining how these biases affect auditors’ assessment of client risk. Because auditors often specialize, their judgments in practice – as they pertain to their area of specialization – may be less prone to the types of bias that experiments reveal in a general laboratory setting. Joyce and Biddle (1981, pg. 122) note that “it is conceivable (perhaps likely) that trained professionals would use fundamentally different cognitive strategies in working problems related to their expertise – strategies much more in tune with normative principles.”

Given the regulated environment in which auditors operate, the existence of proprietary tools specifically designed to reduce the subjectivity involved in client risk assessment, and the countervailing effects of expertise, it remains an open question whether auditors succumb to risk bias.

³ The author of this paper worked as an auditor with Deloitte for several years and has used “Deloitte Radar” in practice. The tool benchmarks a particular client’s financial position and risk levels against a group of peer firms and requires that the audit engagement team obtain explanations when the client appears to be an outlier for a given metric. The benchmarks used by Deloitte Radar are chosen according to objective criteria by individuals that are not part of the audit engagement team and who are not based in the practice office responsible for the audit.

3. RESEARCH DESIGN

3.1 Audit Outcomes Model

Hypothesis 1 predicts that, after controlling for actual risk, clients that appear riskier relative to surrounding firms will be treated more conservatively by their auditors (and vice-versa). The following model is used to test this hypothesis:

$$\text{Audit Outcome}_{it} = \alpha + \beta * \text{Risk Bias}_{it} + \gamma * \text{Actual Client Risk}_{it} + \delta'X + \varepsilon \quad (1)$$

where the subscripts i and t denote firm and year respectively. Two proxies for *Actual Client Risk* are used. First, the FScore developed by Dechow et al. (2011) is used to capture clients' misstatement risk (*Misstatement Risk*). Second, Zmijewski's (1984) model is used to measure clients' bankruptcy risk (*Bankruptcy Risk*). These risk metrics, as well as a set of control variables (contained in the vector X in Equation 1 and discussed in more detail below) are used to predict two audit outcomes.⁴ When *Misstatement Risk* is used as the risk metric, the absolute value of performance adjusted discretionary accruals (*Absolute Value of Abnormal Accruals*) is used as the dependent variable (Kothari et al. 2005; Jones 1991).⁵ When *Bankruptcy Risk* is used as the risk metric, an indicator variable set equal to 1 for firm-years that receive a going concern opinion and set to 0 otherwise (*Going Concern*) is used as the dependent variable.

⁴ The control variables in vector X include year and industry (2-digit SIC) fixed effects. The majority of results are robust to the use of metropolitan statistical area (MSA) fixed effects as well. However, because the dichotomous dependent variables (such as *Going Concern*) do not vary within some MSAs, the use of MSA fixed effects results in significant sample attrition.

⁵ The absolute value of abnormal accruals is used in all of the tabulated analyses. As a robustness test, the analyses are also performed using the signed value of abnormal accruals and the absolute value of total working capital accruals. As expected, the signs on variables of interest are reversed when negative abnormal accruals is used. Otherwise, results are similar to those presented in the tabulated analyses.

Ex-ante, the group of peer firms which an auditor is most likely to use as points of contrast is unclear. The psychology literature emphasizes that “salient” benchmarks are more likely to cause bias (Epley and Gilovich 2005; Bless and Schwarz 2010). This suggests that auditors are more likely to contrast the risk of a target client against that of a small and local set of peer firms. However, individual auditors work as part of highly complex and interconnected firms. Moreover, while decisions regarding client risk assessment are ultimately the purview of the audit partner, the entire engagement team may contribute to the risk assessment process. This could have the effect of broadening the set of peer firms used for contrasting. For this reason, four different peer groups are considered when measuring *Risk Bias* in Equation 1: (1) firms that are both within the same industry and audited by the same practice office; (2) firms audited by the same practice office regardless of industry; (3) firms that are both within the same industry and audited by the same firm; and (4) firms audited by the same firm regardless of industry.⁶ Combining these four groups with the two measures of risk discussed above (i.e. misstatement risk and bankruptcy risk) results in eight proxies for potential risk bias: *Misstatement Risk Bias (Measured Relative to Office-Industry)*, *Misstatement Risk Bias (Measured Relative to Office)*, *Misstatement Risk Bias (Measured Relative to Firm-Industry)*, *Misstatement Risk Bias (Measured Relative to Firm)*, *Bankruptcy Risk Bias (Measured Relative to Office-Industry)*, *Bankruptcy Risk Bias (Measured Relative to Office)*, *Bankruptcy Risk Bias (Measured Relative to Firm-Industry)*, and *Bankruptcy Risk Bias (Measured Relative to Firm)*. These variables are calculated as follows:

⁶ Single-digit SIC codes are used to define industries for purposes of defining peer groups.

Misstatement Risk Bias (Measured Relative to Peer Group X) =

$$\frac{\text{Rank of Misstatement Risk in Peer Group X}}{\text{Number of Clients in Peer Group X}} - \frac{\text{Rank of Misstatement Risk in Population}}{\text{Number of Clients in Population}} \quad (2)$$

Bankruptcy Risk Bias (Measured Relative to Peer Group X) =

$$\frac{\text{Rank of Bankruptcy Risk in Peer Group X}}{\text{Number of Clients in Peer Group X}} - \frac{\text{Rank of Bankruptcy Risk in Population}}{\text{Number of Clients in Population}} \quad (3)$$

where “Peer Group X” is one of the four peer groups defined above.

As an example, consider calculating *Misstatement Risk Bias (Measured Relative to Office)* using using Equation (2). The numerator in the first quotient indicates the rank of the variable *Misstatement Risk* for a given firm-year within the group of all firms audited by the same practice office during the same year; the denominator in the first quotient indicates the total number of firms audited by the same audit office during the year; the numerator in the second quotient indicates the rank of the variable *Misstatement Risk* for the given firm-year within the group of all firms audited by any auditor during the same year; and the denominator in the second quotient indicates the total number of firms receiving an audit by any auditor during the year. Thus the first quotient in Equation (2) is a number between 0 and 1 which captures how risky (in terms of potential misstatements) a given firm appears when contrasted against the limited set of other firms audited by the same practice office, while the second quotient is a number between 0 and 1 which captures how risky the same firm appears when evaluated in the full risk

spectrum.⁷ The difference between these two measures is a number between -1 and 1 which captures the degree to which the auditor's confined reference group may impact his or her perception of risk for the target client. A value of 0 indicates that the target client falls into the same percentile of risk within its reference group as it does in the full sample of firms receiving audits during the same period. In this case there is no risk of bias because the firm's risk appears the same regardless of whether it is evaluated in the context of the entire sample or just those clients in the relevant reference group. Values greater than 0 indicate that the firm falls into a higher percentile of risk within its reference group than it does in the full sample and may therefore appear riskier than it actually is, while values less than 0 indicate the opposite. Figure 1 provides an example and visual depiction of the process and interpretation described above.⁸

[Insert Figure 1 Here]

The first proxy for Audit Outcomes related to Equation (1) (Absolute Value of Abnormal Accruals) is expected to take on lower values when auditors treat their clients more conservatively. Because Hypothesis 1 predicts that, *ceteris paribus*, auditors will treat clients with high relative risk levels more conservatively, the expected sign for the coefficients on the misstatement risk bias proxies is negative. As discussed previously, actual misstatement risk is controlled for in the model. It is worth noting that the predicted sign for the coefficient on actual misstatement risk is positive – opposite of the

⁷ A limitation of this design is that it only captures public firms which appear in both Compustat and Audit Analytics. However, given the systematic differences between private and public firms, it seems unlikely that auditors use private firms as benchmarks when assessing the risk of their public clients.

⁸ This example for calculating *Misstatement Risk Bias (Measured Relative to Office)* generalizes in an obvious way to the other seven measures of risk bias, with one caveat. Where the term "Population" in Equation (2) indicates all firms receiving audits during the year in the example, the "Population" is limited to firms within the same industry-year (single-digit SIC code) when the industry-related reference groups (Office-Industry and Firm-Industry) are used.

predicted sign for misstatement risk bias (i.e. high risk clients are expected to have higher abnormal accruals). This helps allay concerns that the misstatement risk bias measures are simply capturing actual risk rather than a contrasting effect.

The second proxy for audit outcomes is the issuance of a going concern opinion (*Going Concern*). Because the issuance of a going concern opinion is one form of conservative behavior by auditors (Krishnan 1994), the expected sign for the coefficients on the bankruptcy risk bias proxies is positive.

A broad set of client and auditor characteristics are controlled for in vector \mathbf{X} of Equation 1. First, because auditors' general level of conservatism may vary with the overall risk level of their client portfolio, the office-year median value of the risk metrics discussed above (*Misstatement Risk* and *Bankruptcy Risk*) are included in the models (*Median Office Misstatement Risk* and *Median Office Bankruptcy Risk*).⁹ A proxy for audit office size (*Audit Office Size*), equal to the natural log of the sum of all client assets, is included to control for the impact of office size on client treatment (Francis et al. 2013; Choi et al. 2010; Francis and Yu 2009). An indicator variable (*Big4*) – which is set equal to 1 if an observation's auditor is a member of the Big4 and set to 0 otherwise – is included to help control for the well-documented differences between the clients of Big4 and non-Big4 auditors, and for the differences in incentives and capabilities of these groups of auditors (DeAngelo 1981). Proxies for local and national industry leadership (*Local Market Industry Leader* and *National Market Industry Leader*) are also included

⁹ The goal of controlling for median office risk is to ensure that any relationship between the proxies for potential risk bias and audit outcomes relates to the given client's position within the risk continuum of the office, rather than the position of the office in the risk continuum of the broader market.

in the models to account for differences in the audits conducted by industry experts (Francis et al. 2005; Krishnan 2003; Ferguson et al. 2003; Taylor 2000).

A standard set of client firm-year controls are also included in Equation 1. The natural log of client assets (*Client Size*) is included because large clients are less likely to fail and less likely to have high levels of abnormal accruals. Auditors may treat young clients, highly leveraged clients, clients with large amounts of newly acquired external financing, or clients reporting losses more conservatively, and so client age (*Age*), leverage (*Leverage*), change in leverage (*Annual Change in Leverage*), new financing (*New Finance*) and an indicator variable indicating negative income (*Loss*) are added to the model. Similarly, high levels of volatility may trigger conservative treatment by auditors, and so the rolling three-year standard deviation of cash flow (*Rolling SD of Cash Flows*) and revenue (*Rolling SD of Revenue*) are controlled for. Client performance is also likely to impact how auditors view and treat their clients, and so cash flows (*Operating Cash Flows*), market performance (*Annual Stock Return*), and return on assets (*Return on Assets*) are included in the model. Because an audit office's largest clients present a unique set of incentives and risks (Reynolds and Francis 2001), the relative size of each client (*Client Influence*) is added to the models. Finally, for specifications where *Absolute Value of Abnormal Accruals* is the dependent variable, a lagged value of abnormal accruals [*Absolute Value of Abnormal Accruals (t-1)*] and the variable *Going Concern* are included as additional controls. All continuous variables are winsorized at the 1st and 99th percentiles to limit the influence of outliers. A complete list of variables and their definitions is provided in Appendix A.

3.2 Audit Fee Model

Hypothesis 2 predicts that auditors' contrasting-induced conservative (lax) treatment of some clients will result in a higher (lower) audit fees for those clients. The following model is used to test this hypothesis:

$$\text{Log of Audit Fees}_{it} = \alpha + \beta * \text{Risk Bias}_{it} + \gamma * \text{Actual Client Risk}_{it} + \lambda'Y + \varepsilon \quad (4)$$

where the subscripts i and t take the same meanings as in Equation (1). The proxies for *Risk Bias* and *Actual Client Risk* also remain the same as in Equation 1. The dependent variable in Equation 4 is the natural log of total audit fees (*Log of Audit Fees*). The variables included in vector Y of Equation 4 largely overlap with those included in vector X of Equation 1, but also include the number of business operating segments (*Number of Business Operating Segments*) and the number of geographic operating segments (*Number of Geographic Operating Segments*) to control for the additional expense and complexity involved with auditing firms that operate in diverse business and geographic settings. In addition, an indicator variable coded as 1 for firms with financial year ends of December 31st and 0 otherwise (*December 31st Fiscal Year End*) is included to control for the typical auditor “busy season” in which audit firms often face capacity constraints (Bills et al. 2015). All continuous variables are winsorized at the 1st and 99th percentiles to limit the influence of outliers. A complete list of variables and their definitions is provided in Appendix A.

3.3 Auditor Switching Model

Hypothesis 3 predicts that auditors' conservative (lax) treatment of some clients will result in a higher (lower) probability that such clients switch auditors. The following model is used to test this hypothesis:

$$Switch_{it+1} = \alpha + \beta * Risk\ Bias_{it} + \gamma * Actual\ Client\ Risk_{it} + \delta'Z + \varepsilon \quad (5)$$

where the subscripts i and t take the same meanings as in Equation (1). The proxies for *Actual Client Risk Level* and *Risk Bias* also remain the same as in Equation (1). The dependent variable in Equation (5) takes the form an indicator variable set equal to 1 if client i is audited by a different audit firm in year $t+1$ than it was in year t ; 0 otherwise (*Switch*). Because higher values of all proxies for *Risk Bias* indicate that clients appear riskier in their local context than in the context of the entire sample, the coefficients related to each proxy are expected to be positive in Equation (5).

The set of control variables included in vector Z of Equation (5) partially overlaps with the set included in vector X of Equation (1), but is primarily based on the model of Landsman et al. (2009). It includes controls for client growth (*Asset Growth*), earnings quality (*Absolute Value of Abnormal Accruals*), performance (*Return on Assets and Loss*) and the contents of clients' balance sheets (*Inventory and Receivables*, *Cash*, and *Leverage*). Because firms often switch auditors following mergers and acquisitions, an indicator variable (*Acquisition*) – set equal to 1 if the client engaged in a merger or acquisition in the preceding two years; 0 otherwise – is included as a control. Two types of modified auditor reports are controlled for. First, the variable *Going Concern* is included in the model. Second, a separate indicator variable – set equal to 1 if an opinion is modified for any reason other than a going concern issue; 0 otherwise (*Modified Report Other Than GCAR*) – is added. The variables *Local Market Industry Leader* and *National Market Industry Leader* are included, as well as the auditor's tenure with the client (*Tenure*). Finally, a measure of the potential client-auditor mismatch suggested by Shu (2000) is included (*Mismatch*). All continuous variables are winsorized at the 1st and 99th

percentiles to limit the influence of outliers. A complete list of variables and their definitions is provided in Appendix A.

3.4 Sample Selection and Summary Statistics

The sample selection process used in this study begins with all firm-years at the intersection of the Compustat Annual and Audit Analytics Opinions databases for the years 2000 through 2014 (95,637 firm-years). The year 2000 is chosen as the initial year of the sample because Audit Analytics data from before 2000 is very sparse. The year 2014 is the last year for which data could be obtained at the time of this writing. Observations with missing values for required variables are removed, as are firm-years audited by the now defunct Arthur Andersen, resulting in an initial sample of 41,274 firm-years.¹⁰ In cases where *Going Concern* is used as the dependent variable, the convention of limiting the sample to distressed firm-years (i.e. those with negative cash flows or negative income) and firms that have not previously received a going concern opinion is followed (DeFond et al. 2002). This results in a sample of 14,193 firm-years. Finally, in supplementary analysis propensity-score matching is used, further reducing the sample to 17,153 firm-years (7,049 distressed firm-years). Appendix B details the sample selection process.

Table 1 provides descriptive statistics for the variables used in this study. The statistics for the dependent variables and the variables related to risk are of particular interest. The values of the dependent variables are generally consistent with the prior literature (Francis et al. 2005; Francis and Michas 2013; Carson et al. 2013; Francis et al.

¹⁰ Results are robust to including Arthur Andersen clients in the analysis.

2013; Landsman et al. 2009). The absolute value of abnormal accruals (*Absolute Value of Abnormal Accruals*) is equal to approximately 12 percent of total assets on average.

Approximately 11 percent of firm-years in the sample receive a going concern opinion, while 10 percent eventually restate their financials, one percent enter bankruptcy in the subsequent year, and nine percent switch auditors.

[Insert Table 1 Here]

The proxies for risk bias measured at the office level show that the mean and median firms in the sample have relative risk levels similar to their absolute risk levels; that is, the mean and median values of *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)* are close to 0. However, there is significant variability in these variables, as demonstrated by their low 25th percentiles (-.247 and -.278), high 75th percentiles (.296 and .245), and large standard deviations (.378 and .363). When the entire firm is used as the peer group with the variables *Misstatement Risk Bias (Measured Relative to Firm)* and *Bankruptcy Risk Bias (Measured Relative to Firm)* the mean and median values remain close to 0, however, there is much less variation in these measures. Both the 25th and 75th percentiles are close to 0, and the standard deviations are relatively small.¹¹ Restricting peer groups by industry using *Misstatement Risk Bias (Measured Relative to Firm-Industry)*, *Misstatement Risk Bias (Measured Relative to Office-Industry)*, *Bankruptcy Risk Bias (Measured Relative to Firm-Industry)* and *Bankruptcy Risk Bias (Measured Relative to Office-Industry)* has the expected effect of moving the mean values of the bias measures

¹¹ It should be expected that, as the sample size increases from the number of clients in an individual practice office to the number of clients in each firm, sample characteristics begin to converge to population characteristics.

away from 0. Some observations are lost when calculating these measures because they belong to office-industry-years or firm-industry-years without at least three observations.¹²

¹² In order to be included in the sample, each observation must belong to a peer group of at least three firm-years. Results are robust to increasing this restriction to 10 firm-years.

4. PRIMARY RESULTS

4.1 Tests of Hypothesis 1

Table 2 provides the results of estimating Equation 1 using *Absolute Value of Abnormal Accruals* as the dependent variable and misstatement risk bias proxies as the variables of interest. The first model (Model 1) excludes bias proxies, but includes the measure of actual client misstatement risk (*Misstatement Risk*). Consistent with the notion that high misstatement risk clients are likely to have high levels of discretionary accruals, the coefficient on *Misstatement Risk* is positive and significant. In Model 2, *Misstatement Risk Bias (Measured Relative to Office)* is added to the model and, consistent *Hypothesis 1*, the coefficient is negative and significant. This suggests that clients which appear risky by contrast with other clients of the same office are treated more conservatively by their auditors, resulting in lower levels of discretionary accruals, even after controlling for clients' actual risk levels. This effect is economically as well as statistically significant. The coefficient of -0.109 in Model 2 suggests that, holding actual risk levels (and other control variables) constant, a one standard deviation increase in the misstatement risk bias proxy (.363) results in a decrease in discretionary accruals of 3.9 percent of assets (0.363×-0.109), or approximately 30 percent of the sample mean.

[Insert Table 2 Here]

Model 3 of Table 2 replaces *Misstatement Risk Bias (Measured Relative to Office)* with *Misstatement Risk Bias (Measured Relative to Office-Industry)*. The coefficient on *Misstatement Risk Bias (Measured Relative to Office-Industry)* is negative and statistically significant, consistent with an office-industry effect. However, the magnitude of the effect is significantly ($p < .05$) smaller when measured at the office-industry level

(Model 3) than when measured at the office level (Model 2).¹³ Models 4 and 5 use the test variables *Misstatement Risk Bias (Measured Relative to Firm-Industry)* and *Misstatement Risk Bias (Measured Relative to Firm)*. The coefficients on both variables are statistically insignificant, providing no support for the hypothesis that auditors fixate on the risk levels of their firm or firm-industry client portfolios. Finally, in Model 6, all four misstatement risk bias proxies are included in the analysis. The results from the combined analysis are consistent with the individual models; the effect predicted by *Hypothesis 1* is strongest when measured at the office level using *Misstatement Risk Bias (Measured Relative to Office)*, followed by the office-industry level using *Misstatement Risk Bias (Measured Relative to Office-Industry)*.

Table 3 parallels Table 2 but uses *Going Concern* as the dependent variable and the bankruptcy risk bias proxies as the variables of interest. Following the prior literature on the determinants of going concern opinions, the sample used in Table 3 is limited to distressed firms (DeFond et al. 2002).¹⁴ The first model (Model 1) excludes proxies for risk bias, but includes the measure of actual client bankruptcy risk (*Bankruptcy Risk*). Consistent with the notion that high bankruptcy-risk clients are more likely to receive going concern opinions, the coefficient on *Bankruptcy Risk* is positive and significant. In Model 2, *Bankruptcy Risk Bias (Measured Relative to Office)* is added to the model and, consistent with the effect predicted by *Hypothesis 1*, the coefficient is positive and

¹³ The smaller magnitude and lower significance of coefficients on the industry restricted measures may be a function of noise introduced by relatively small denominators in the first quotients of Equations (1) and (2). For instance, if there are only three observations in an office-industry-year, the first quotient of Equations (2) and (3) can take only three possible values (.33, .66, or 1). The granularity of the bias measures is increased, and noise is therefore reduced, as the number of observations in a peer group increases.

¹⁴ As discussed in Section III above, “distressed” refers to firms which have 1) negative cash flows, 2) negative income, or 3) both negative cash flows and negative income.

significant. This suggests that clients which appear risky relative to other clients of the same office are treated more conservatively by their auditors, resulting in more going concern opinions, even after controlling for clients' actual risk levels. This effect is economically as well as statistically significant. Based on the results in Model 2, holding actual risk levels (and other control variables) constant, the marginal effect of a move from one half a standard deviation below to one half a standard deviation above the mean of *Bankruptcy Risk Bias (Measured Relative to Office)* (e.g. a change from -.19 to .19) is an approximately 2.4 percentage point increase in the likelihood of receiving a going concern opinion.

[Insert Table 3 Here]

Models 3 and 4 of Table 3 replace *Bankruptcy Risk Bias (Measured Relative to Office)* with *Bankruptcy Risk Bias (Measured Relative to Office-Industry)* and *Bankruptcy Risk Bias (Measured Relative to Firm-Industry)*. The coefficient on both variables is positive and statistically significant, consistent with an industry-based contrasting effect. However, the magnitude of the effect is significantly smaller ($p < .01$) when measured at the office-industry level (Model 3) or firm-industry level (Model 4) than when measured at the office level (Model 2). Model 5 uses the test variable *Bankruptcy Risk Bias (Measured Relative to Firm)* and finds no statistically detectable effect on the propensity of a firm to receive a going concern opinion. Finally, in Model 6, all four bankruptcy risk bias proxies are included in the analysis. Consistent with the individual models, the effect predicted by *Hypothesis 1* is strongest when measured at the office level using *Bankruptcy Risk Bias (Measured Relative to Office)*.

The results from Tables 2 and 3 suggest that auditors do succumb to contrast effects when assessing client risk and that auditor conservatism varies predictably as a result. Although the effect of contrasting on audit outcomes is consequential in its own right, it may also produce secondary effects for audit pricing and client turnover. The following two subsections are devoted to testing this possibility. Because the strongest evidence from Tables 2 and 3 supports the notion that auditors contrast using the risk levels of other clients within their home office (rather than on the risk levels of clients within the same industry or within the entire audit firm), subsequent tests use only the office-level bias proxies.

4.2 Test of Hypothesis 2

Table 4 provides the results from estimating Equation (4) which models audit fees as a function of relative client risk. Model 1 uses *Misstatement Risk Bias (Measured Relative to Office)* and Model 2 uses *Bankruptcy Risk Bias (Measured Relative to Office)*. *Hypothesis 2* predicts that clients which appear riskier (less risky) in the context of nearby peers will pay higher (lower) audit fees, regardless of their actual risk levels. Consistent with this prediction, the coefficients on both risk bias proxies are positive and significant. Both models are log-level and estimated using OLS. The coefficients may therefore be interpreted as the percentage change in fees associated with a one unit change in the risk bias proxies. Accordingly, a one-unit increase in *Misstatement Risk Bias (Measured Relative to Office)* (e.g. an increase from -.5 to .5) is associated with a 14 percent increase in audit fees while a similar change in *Bankruptcy Risk Relative to Office* is associated with a 19 percent increase in audit fees.

[Insert Table 4 Here]

4.3 Test of Hypothesis 3

Table 5 – Panel A provides the results from estimating Equation (5) which models auditor switches as a function of risk bias. Model 1 uses *Misstatement Risk Bias (Measured Relative to Office)* and Model 2 uses *Bankruptcy Risk Bias (Relative to Office)*. Hypothesis 3 predicts that because clients which appear riskier (less risky) when contrasted with proximate peers are treated with higher (lower) levels of auditor conservatism and charged higher (lower) audit fees, regardless of their actual risk levels, such clients will be more (less) likely to switch auditors. Consistent with this prediction, the coefficients on both risk bias proxies are positive and significant. These effects are of economic, as well as statistical significance. Based on the estimation of Models 1 and 2, a one unit change in *Misstatement Risk Bias (Measured Relative to Office)* or *Bankruptcy Risk Bias (Measured Relative to Office)* results in a roughly 2.5 or 1.8 percentage point increase in the probability that the client firm changes auditors.

[Insert Table 5 Here]

The results from Models 1 and 2 of Table 5 – Panel A are intuitive, but are not descriptive of an audit market in equilibrium. If risk levels are stable over time, and if clients subject to auditor bias are more likely to switch auditors, then all clients should eventually find suitable auditors. This would result in relatively homogenous client portfolios within audit offices and no observable relationship between relative risk levels and auditor switching behavior by clients. However, relative risk levels may not be stable. By construction, both office-based relative risk bias proxies can change because of

either 1) a change in the risk for an individual client or 2) a change in risk for the portfolio of clients held by an audit office. If either of these risk levels change over time, so long as they do not move in tandem, relative risk levels will also shift. This may encourage clients that find themselves drifting closer to the top of their audit office's client-risk distribution to consider switching auditors. To test this possibility, Models 3 and 4 of Table 5 – Panel A use cumulative three-year changes in the risk bias proxies (i.e. *3-Year Change in Misstatement Risk Bias* and *3-Year Change in Bankruptcy Risk Bias*) as test variables. Coefficients on the change versions of the risk bias proxies are both positive and significant, suggesting that as firms move towards the top of their audit office's client-risk distribution they become more likely to change auditors.

Switching auditors will only provide a client with relief from contrasting-related conservatism if the client's relative risk level changes as a result. Thus, if increased auditor conservatism due to contrast effects is driving clients to switch auditors then they should engage new auditors with higher risk portfolios, thereby reducing their own relative risk level. Table 5 – Panel B provides the mean and median changes in clients' risk bias levels following auditor switches. Both means and both medians are significantly lower than 0 indicating that, on average, firms switch to new auditors with higher risk client portfolios. This has the effect of lowering clients' relative risk, potentially alleviating the overly conservative treatment experienced by clients with their original auditors.

5. ADDITIONAL ANALYSIS

5.1 Modeling Positive and Negative Risk Bias Separately

The relative bias metrics used in this study naturally partition clients into those that are likely to be perceived as riskier than they actually are (those with positive values of the bias proxies) and those that are likely to be perceived as less risky than they actually are (those with negative values of the bias proxies). Thus far, no distinction has been made between these two groups, yet the effects documented in Section IV may not be symmetrical and the overall effect documented in previous analyses may be driven by either group. To further investigate this possibility, four new variables are created.

Misstatement Risk Bias (Positive) is set equal to *Misstatement Risk Bias (Measured Relative to Office)* if *Misstatement Risk Bias (Measured Relative to Office)* is positive; 0 otherwise. *Misstatement Risk Bias (Negative)* is set equal to the absolute value of *Misstatement Risk Bias (Measured Relative to Office)* if *Misstatement Risk Bias (Measured Relative to Office)* is negative; 0 otherwise. *Bankruptcy Risk Bias (Positive)* and *Bankruptcy Risk Bias (Negative)* are similarly defined with regard to *Bankruptcy Risk Bias (Measured Relative to Office)*. The primary models from tables 2, 3, 4, and 5 are then re-estimated using the separate positive and negative versions of the risk bias variables. The results are presented in Table 6.

[Insert Table 6 Here]

Across all six models in Table 6, both the positive and negative risk bias variables are significant in the expected direction (i.e. positive risk bias is associated with more conservative treatment, higher audit fees, and a higher likelihood of auditor switching while the reverse is true for negative risk bias). However, the magnitude of the

coefficients is not symmetrical across positive and negative risk bias. For instance, Model 1 in Table 6 suggests that auditors do seem to constrain the use of accruals by positive misstatement risk bias clients, however the relaxing of such constraints for negative misstatement risk bias clients appears to be a much stronger effect. On the other hand, Model 2 reveals that, while negative misstatement risk bias clients receive an audit fee discount, positive misstatement risk bias clients are charged a comparatively large fee premium. Model 3 shows that the auditor switching associated with *Misstatement Risk Bias*, as documented in Table 5, is driven largely by negative risk bias clients' reluctance to leave their current auditor, although positive risk bias clients are slightly more likely to leave their auditors. For each model using *Misstatement Risk Bias (Positive)* and *Misstatement Risk Bias (Negative)* (i.e. Models 1, 2, and 3) the difference in the absolute value of the coefficients on the two variables is significant at $p < .05$ or better. The difference in magnitude of the coefficients on *Bankruptcy Risk Bias (Positive)* and *Bankruptcy Risk Bias (Negative)* in Models 5, and 6 is significant in the same direction as in Models 2 and 3 for misstatement risk bias. The difference in Model 4 is not statistically significant.

5.2 Risk Bias and Client Firm Outcomes

The analysis to this point has proceeded under the implicit assumption that contrasting effects, as captured by the relative risk variables *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)*, is an arbitrary function of each offices' client portfolio and has no relationship with actual client-level outcomes. Table 7 explicitly tests this assumption. If, in fact, the measures of "bias" used in the preceding analyses are associated with negative client outcomes such

as restatements and bankruptcies, auditors may be justified in treating clients with high relative risk levels more conservatively. In other words, if *Misstatement Risk Bias (Measured Relative to Office)* predicts actual misstatements or if *Bankruptcy Risk Bias (Measured Relative to Office)* predicts actual bankruptcies, the relationship between these variables and auditors' conservative treatment of clients may represent a rational response and not a behavioral bias.

The dependent variables in Models 1 and 2 of Table 7 are *Misstatement* (an indicator variable equal to 1 if a client-firm eventually restates its issued financial statements; 0 otherwise) and *Bankruptcy (t+1)* (an indicator variable equal to 1 if a client files for bankruptcy in year t+1; 0 otherwise), respectively. The test variables are the same as in the previous tests – namely, *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)*.¹⁵ Although both proxies for actual client risk (*Misstatement Risk* and *Bankruptcy Risk*) predict negative client outcomes, the risk bias variables are statistically insignificant, indicating that there is no observable relationship between measured risk bias and related client outcomes. Thus, the relationship between contrast effects and audit outcomes evidenced by the analyses in Tables 2 through 4 appears to represent an unsupportable bias on the part of auditors.

[Insert Table 7 Here]

¹⁵ As discussed in reference to Table 6, the bias metrics used in this study naturally partition clients into those that are likely to be perceived as riskier than they actually are (those with positive values of the bias proxies) and those that are likely to be perceived as less risky than they actually are (those with negative values of the bias proxies). Including these positive and negative components separately in the models of Table 7 does not change the (lack of) results.

5.3 Propensity Score Matching

There are likely to be important differences between clients with high and low values of the test variables *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)*. Importantly, these *relative* risk proxies may be capturing some component of *actual* client risk (although the test in Table 7 helps to rule out this possibility).¹⁶ Ideally, all firms in the sample would have the same level of actual risk but different levels of relative risk, so that actual risk could be ruled out as an explanation for the observed relationship between relative risk and audit outcomes. Although Equation (1) includes controls for numerous client and auditor characteristics (including proxies for clients' actual risk), significant imbalance in these characteristics may render their inclusion as controls in typical multivariate regression models insufficient to remove bias (Armstrong et al. 2010). To examine this possibility, the samples used in the original analysis are split into two groups based on the values of the risk bias proxies. The first group includes observations that fall in the top quartile of measured risk bias and the second group includes all other observations.

The first four columns of Table 8 – Panel A examine the average values of actual risk (i.e. *Misstatement Risk* and *Bankruptcy Risk*), as well as several other key variables (i.e. *Median Office Misstatement Risk*, *Median Office Bankruptcy Risk*, *Client Size*, *Office Size*, and *Big N*) across the risk bias partitions. Column three provides the differences in means. Column four provides standardized differences (i.e. the “bias” percentages),

¹⁶ Alternatively, clients relative risk may capture some auditor characteristic not sufficiently controlled for in previous models. The inclusion of auditor variables in the propensity score matching procedure documented in this section helps address this concern.

which have advantages over simple t-tests when assessing balance in covariates (Austin 2009).¹⁷

[Insert Table 8 Panel A Here]

Nearly all of the differences shown in the “Before Match” portion of Table 8 – Panel A are highly statistically significant. Moreover, the standardized differences indicate worrisome levels of covariate imbalance. There is no consensus on when standardized differences indicate the potential for bias, however several researchers have offered “rules of thumb”. For instance, Rosenbaum and Rubin (1983) use a cut-off of 20 percent to indicate a “substantial difference”, but other researchers have suggested 10 percent (Austin 2009). Using either standard, many of the variables in Table 8 – Panel A are potentially problematic. One common method of addressing covariate imbalance is to use a propensity-score matched sample (Austin 2009). Propensity-score matching was first suggested by Rosenbaum and Rubin (1983), and attempts to maximize differences in a variable of interest [in the case at hand, *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)*] while minimizing differences in potentially confounding covariates.

To help address the covariate imbalance shown in the “Before Match” portion of Table 8 – Panel A, a propensity score match is performed using a caliper of .03.¹⁸ The matching procedure reduces sample sizes considerably, however, the loss of sample size

¹⁷ The formula for computing the standardized difference is $100(\bar{x}_1 - \bar{x}_{0M})/[(S_1^2 + S_{0R}^2)/2]^{1/2}$ where, \bar{x}_1 and \bar{x}_{0M} are the sample means of the treated group and the matched control group (or the treated and matched reservoir if performed before matching) and S_1^2 and S_{0R}^2 are the sample variances in the treated and control reservoir. See Rosenbaum and Rubin (1983) for more information.

¹⁸ When a treatment observation cannot be matched to a control within a caliper of .03 it is removed from the sample and so the matched samples are slightly smaller than half the size of the full samples. Unreported robustness test show that results are not sensitive to the use of a nearest neighbor match with no caliper, or to the use of a caliper of .05.

is offset by significantly better covariate balance. The “After Match” portion of Table 8 – Panel A shows differences for the same variables in the “Before Match” portion, but uses the matched sample. The differences in almost all the variables are reduced considerably. There are only three variables with means that are (weakly) statistically different (at $p < .10$) and standardized differences are all below 10 in the matched sample.

Table 8 – Panel B re-estimates the primary tests of Tables 2, 3, 4, and 5 using the matched sample. The control variables included in the original full-sample tests are also included in the models for Table 8 – Panel B but are not shown to conserve space. All of the results originally estimated in the full sample also hold in the matched sample. Thus, it appears that the results from the original analyses is not driven by covariate imbalance.

[Insert Table 8 Panel B Here]

5.4 Cross-sectional Results

Next, the primary results of this study are examined cross-sectionally. Six different variables which may impact auditors risk assessment bias are used as partitions. First, audit office size (the top decile versus bottom nine deciles) and Big-4 status are used as a partitioning variables because prior research suggests that the largest audit offices and audit firms have the ability and incentives to perform superior audits (DeAngelo 1981; Francis and Yu 2009). Next, auditor tenure is used as a partition (tenure of two years or less versus tenure greater than two years) because auditors may be especially susceptible to cognitive biases when assessing the risk of a client that is still relatively unfamiliar. Highly influential clients may prompt more careful consideration of risk by auditors, and so bias is examined separately for clients above and below the

median level of the variable *Client Influence*. Prior research suggests that expertise may dampen the impact of cognitive biases (Joyce and Biddle 1981) and so the variable *Local Market Industry Leader* is used as a partition. Finally, the substantial increase in audit market regulation following the passage of the Sarbanes Oxley Act may have reduced auditor biases. The year 2004 (the first year the PCAOB was fully operational) is therefore used as a partition.

The results of re-estimating the primary models of this study separately in the subsamples discussed above are shown in panels A through F of Table 9. Consistent with the preceding discussion, the coefficients in the left two columns are consistently larger in magnitude than the coefficients in the right two columns and, in most cases, these differences are statistically significant. Thus the cross-sectional tests provide some corroborating evidence for *Hypothesis 1*.

[Insert Table 9 Here]

5.5 The Impact of DDAR on Bias at Deloitte

As discussed in Section 2, in response to the issuance of Accounting and Auditing Enforcement Release No. 2237 by the Securities and Exchange Commission, Deloitte implemented a proprietary tool (“DDAR”) designed to help standardize its assessment of client risk. If DDAR was successful in standardizing client risk assessment, the contrasting effects demonstrated in the preceding tests should be (at least partially) mitigated at Deloitte relative to other audit firms in the post-implementation period. A difference-in-difference research design is used to test this prediction.

First, two new variables are defined. *Deloitte* is an indicator variable set equal to 1 if a firm-year is audited by Deloitte; 0 otherwise. *Post* is an indicator variable set equal to 1 if the year is 2005 or later; 0 otherwise.¹⁹ These two variables are interacted with each other and with the risk bias proxies *Misstatement Risk Bias (Measured Relative to Office)* and *Bankruptcy Risk Bias (Measured Relative to Office)*. The sample for the difference-in-difference test is limited to clients of Big 4 auditors so that the three-way interactions capture the change in contrasting at Deloitte between the pre and post periods, relative to the change for other comparable Big 4 audit firms over the same period. The results of this analysis are presented in Table 10. Consistent with the implementation of DDAR standardizing client risk assessment at Deloitte, the difference-in-difference coefficients (i.e. the coefficients on the three-way interactions) take signs opposite to their related risk bias variables and are statistically significant. Thus it appears that DDAR was successful in limiting the effect of contrasting in auditors' assessment of client risk.

[Insert Table 10 Here]

¹⁹ One limitation of this test is that a “clean” post period is difficult to define. Accounting and Auditing Enforcement Release number 2237 was issued in the year 2005, but relates to Deloitte’s audits of Adelphia for the years 1998 through 2001. The language in the enforcement release implies that Deloitte’s implementation of DDAR was in response to the Adelphia case, suggesting that implementation likely occurred sometime between the last year covered by the enforcement release (2001) and the date that the enforcement release was issued (2005). As sensitivity, each year in this period was used separately to define the *Post* variable. The year 2004 yields results similar to those presented in Table 10. The difference-in-difference coefficients (i.e. the coefficients on the three-way interactions) lose their significance when years prior to 2004 are used to define the post period.

6. CONCLUSION

This study extends the existing work on contrasting effects by providing robust archival evidence on the effect of bias in auditors' assessments of client risk. When assessing client risk, auditors are required to make highly subjective judgments about uncertain quantities (such as risk levels), and they plan and conduct their audits according to these judgments. However, auditors do not assess client risks in a vacuum – rather, they are surrounded by potential reference points. This paper predicts, and finds, that auditors contrast the risk of a target client against other firms in their environment. This results in conservative audit outcomes for clients that appear risky relative to the other clients within the audit office and, conversely, in less conservative audit outcomes for clients that appear less risky. This result holds after controlling for the clients' actual risk levels. Moreover, auditors appear to adjust their fees in response to both actual and perceived risk.

The effects of auditor contrast effects on clients' auditor-switching behavior is also examined. Because auditors risk assessment bias is, in part, a function of the risk level of the other clients of the audit office, clients may be able to avoid overly conservative treatment by switching to an auditor with a riskier client portfolio. Consistent with this hypothesis, the evidence suggests that clients with high relative risk levels are more likely to switch auditors. Clients that have large positive changes in relative risk during the previous three years are also more likely to switch auditors. Moreover, when clients switch auditors, they often choose new auditors with a higher risk client portfolio, effectively lowering their own apparent risk by comparison.

These findings represent some of the first archival evidence on the existence and consequences of contrast effects in the behavior of financial statement auditors and contribute to the extant literature on how auditors assess client risk. This paper also complements the growing experimental literature on auditors' susceptibility to contrast effects by demonstrating that these effects manifest in practice, despite countervailing mechanisms (such as prescriptive audit standards and a powerful independent regulator) which are difficult to replicate in a laboratory setting.

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Appendix A: Variable Definitions

Dependent Variables

Absolute Value of Abnormal Accruals	The absolute value of the residual from the Jones (1991) model, controlling for firm performance (Kothari et al. 2005).
Going Concern Opinion	An indicator variable equal to 1 for client-years which received a going concern opinion from their auditor; 0 otherwise (Audit Analytics item GOING_CONCERN).
Restatement	An indicator variable equal to 1 if a firm-year's financial statements were eventually restated for any reason, as reported by Audit Analytics' Restatements database; 0 otherwise.
Bankruptcy (t+1)	An indicator variable equal to 1 if the firm files for bankruptcy under Chapters 7 and 11 during the year; 0 otherwise.
Switch	An indicator variable equal to 1 if a client is audited by a different audit firm in year t than it was in year t-1; 0 otherwise.
Type I Error	An indicator variable equal to 1 if the firm receives a going concern opinion during the year and does not file for bankruptcy during the subsequent year.
Type II Error	An indicator variable equal to 1 if the firm does not receive a going concern opinion during the year and does file for bankruptcy during the subsequent year.

Variables of Interest

Restatement Risk Bias (Measured Relative to Office)	A measure of the difference between a client's restatement risk relative to the portfolio of other clients audited by the same practice office and its risk relative to the entire sample of audits performed during the same period.
Restatement Risk Bias (Measured Relative to Office-Industry)	A measure of the difference between a client's restatement risk relative to the portfolio of other clients within the same industry and audited by the same practice office and its risk relative to the entire sample of audits performed within the same industry and during the same period.
Restatement Risk Bias (Measured Relative to Firm-Industry)	A measure of the difference between a client's restatement risk relative to the portfolio of other clients within the same industry and audited by the same firm and its risk relative to the entire sample of audits performed within the same industry and during the same period.
Restatement Risk Bias (Measured Relative to Firm)	A measure of the difference between a client's restatement risk relative to the portfolio of other clients audited by the same firm and its risk relative to the entire sample of audits performed during the same period.
Bankruptcy Risk Bias (Measured Relative to Office)	A measure of the difference between a client's bankruptcy risk relative to the portfolio of other clients audited by the same practice office and its risk relative to the entire sample of audits performed during the same period.
Bankruptcy Risk Bias (Measured Relative to Office-Industry)	A measure of the difference between a client's bankruptcy risk relative to the portfolio of other clients within the same industry and audited by the same practice office and its risk relative to the entire sample of audits performed within the same industry and during the same period.
Bankruptcy Risk Bias (Measured Relative to Firm-Industry)	A measure of the difference between a client's bankruptcy risk relative to the portfolio of other clients within the same industry and audited by the same firm and its risk relative to the entire sample of audits performed within the same industry and during the same period.
Bankruptcy Risk Bias (Measured Relative to Firm)	A measure of the difference between a client's bankruptcy risk relative to the portfolio of other clients audited by the same firm and its risk relative to the entire sample of audits performed during the same period.

Risk Related Controls

Restatement Risk	A measure of a client's restatement risk based on the F-Score of Dechow et al. (2011).
Bankruptcy Risk	A measure of a client's business failure risk based on the model of Zmijewski (1984).
Median Office Restatement Risk	The value of <i>Restatement Risk</i> for the median client of a given audit practice office.
Median Office Bankruptcy Risk	The value of <i>Bankruptcy Risk</i> for the median client of a given audit practice office.

Client-Level Controls

Acquisition	An indicator variable equal to 1 if the client firm engaged in a merger or acquisition during the previous 2 years; 0 otherwise.
Age	The number of years between when a client firm first appears in the Compustat Annual database and the year of the observation.
Annual Change in Leverage	The value of <i>Leverage</i> in year t less the value of <i>Leverage</i> in year t-1.

Annual Stock Return	The cumulative stock return for the 12-month period prior to the observation's fiscal year end.
Asset Growth	Total assets in year t less total assets in year t-1, scaled by total assets in year t-1.
Cash	Total cash as of the balance sheet date scaled by total assets on the same date.
Client Influence	The log of total client-firm assets (Compustat item AT) scaled by the sum of logged total assets for all firms audited by the same audit office.
Client Size	A client-year's logged total assets (Compustat item AT) in millions of dollars.
Inventory and Receivables	The sum of a client-year's total inventory (Compustat item INV) and receivables (Compustat item REC) scaled by total assets (Compustat item AT).
Investment	Total investment assets of the client-firm at year end, measured as the sum of cash and cash equivalents, short-term investments and long term investments in equity, scaled by total assets.
Leverage	Total client-firm debt (Compustat item DLTT) scaled by total assets (Compustat item AT).
Loss	An indicator variable equal to 1 if net income (Compustat item NI) is negative; 0 otherwise.
Mismatch	An indicator variable equal to 1 if the client is mismatched with the incumbent auditor, calculated using the methodology in Shu (2000); 0 otherwise.
Modified Report (Other Than GCAR)	An indicator variable equal to 1 if the audit opinion is modified for anything other than a going concern; 0 otherwise.
New Finance	An indicator variable equal to 1 if a client firm issued new debt or equity during the year.
Operating Cash Flows	Total client-firm cash flows from operations (Compustat item OANCF) scaled by total assets.
Return on Assets	Total client-firm net income (Compustat item NI) scaled by assets (Compustat item AT).
Rolling SD of Cash Flows	The standard deviation of operating cash flows (Compustat item OANCF) for the period t-4 through t-1.
Rolling SD of Revenue	The standard deviation of client firm revenue (Compustat item REVT) for the period t-4 through t-1.
<i><u>Auditor-Level Controls</u></i>	
Audit Office Size	The logged total assets of clients audited by the audit office in the current fiscal year in billions of dollars.
Auditor Tenure	The number of continuous years in which the current firm has issued an opinion on the client's annual financial statements
Big4	An indicator variable equal to 1 if the firm's auditor is a member of the Big4; 0 otherwise.
Local Market Industry Leader	An indicator variable equal to 1 if the sum of the assets held by clients of an audit office in a given MSA and industry is higher than the sum of assets held by the clients of any other audit office in the MSA and industry; 0 otherwise
National Market Industry Leader	An indicator variable equal to 1 if the sum of the assets held by clients of an audit firm is higher than the sum of the assets held by the clients of any other firm in the country; 0 otherwise.

Appendix B: Sample construction

	<u>Restatement Risk Sample</u>	<u>Going Concern Sample</u>
Compustat firm years, 2000 - 2014	114,117	114,117
Less firm-years lost in merge with Audit Analytics	-18,480	-18,480
Combined Compustat and Audit Analytics firm-years	95,637	95,637
Less firm-years missing values for required variables and those audited by AA	-54,363	-54,363
Less firms with positive income and positive cash flows		-27,081
Initial Sample	41,274	14,193
Less firms lost in propensity-score matching	-24,121	-7,144
Matched Sample	17,153	7,049

Note: Some observations are dropped in specific tests involving binary dependent variables that are perfectly predicted by the set of control variables. This causes sample sizes in some tests to vary slightly from those shown here.

Table 1: Descriptive Statistics

Variables	Count	Mean	25th Pctl	Median	75th Pctl	Standard Deviation
<i>Dependent Variables</i>						
Absolute Value of Abnormal Accruals	41,476	0.124	0.035	0.092	0.224	0.101
Bankruptcy (t+1)	41,476	0.006	0.000	0.000	0.000	0.080
Going Concern Opinion	41,476	0.113	0.000	0.000	0.000	0.317
Log of Audit Fees	41,476	13.037	11.945	13.069	14.071	1.480
Restatement	41,476	0.109	0.000	0.000	0.000	0.311
Switch	41,476	0.105	0.000	0.000	0.000	0.307
Type I Error	41,476	0.109	0.000	0.000	0.000	0.311
Type II Error	41,476	0.002	0.000	0.000	0.000	0.042
<i>Variables of Interest</i>						
Bankruptcy Risk Bias (Measured Relative to Office)	41,476	0.025	-0.247	0.028	0.296	0.378
Bankruptcy Risk Bias (Measured Relative to Office-Industry)	24,215	0.066	-0.188	0.052	0.312	0.375
Bankruptcy Risk Bias (Measured Relative to Firm-Industry)	31,952	0.003	-0.244	-0.019	0.231	0.366
Bankruptcy Risk Bias (Measured Relative to Firm)	41,476	0.006	-0.027	-0.007	0.006	0.142
Misstatement Risk Bias (Measured Relative to Office)	41,476	-0.016	-0.278	-0.007	0.245	0.363
Misstatement Risk Bias (Measured Relative to Office-Industry)	24,215	0.090	-0.017	0.082	0.198	0.182
Misstatement Risk Bias (Measured Relative to Firm-Industry)	31,692	0.004	-0.032	0.000	0.034	0.066
Misstatement Risk Bias (Measured Relative to Firm)	41,476	0.016	-0.020	0.003	0.014	0.141
<i>Risk Related Controls</i>						
Bankruptcy Risk	41,476	-0.008	-2.624	-1.380	0.076	5.213
Median Office Misstatement Risk	41,476	0.564	0.397	0.508	0.663	0.243
Median Office Bankruptcy Risk	41,476	-0.628	-1.745	-1.257	-0.620	2.404
Misstatement Risk	41,476	0.964	0.281	0.490	0.991	2.596
<i>Client-Level Controls</i>						
Acquisition	41,476	0.309	0.000	0.000	1.000	0.462
Age	41,476	17.739	8.000	13.000	22.000	13.925
Annual Change in Leverage	41,476	0.090	-0.042	0.001	0.061	0.979
Annual Stock Return	41,476	0.630	-0.301	0.022	0.394	5.892
Asset Growth	41,476	0.470	-0.077	0.038	0.171	17.280
Cash	41,476	0.224	0.037	0.132	0.337	0.239
Client Influence	41,476	0.128	0.023	0.055	0.128	0.205
Client Size	41,476	18.953	17.264	19.076	20.740	2.573
December 31st Fiscal Year End	41,476	0.669	0.000	1.000	1.000	0.470
Inventory and Receivables	41,476	0.149	0.047	0.115	0.203	0.416
Investment	41,476	0.224	0.037	0.132	0.337	0.239
Leverage	41,476	0.855	0.291	0.490	0.701	2.230
Loss	41,476	0.428	0.000	0.000	1.000	0.495
Mismatch	41,476	0.237	0.000	0.000	0.000	0.425
Modified Report (Other Than GCAR)	41,476	0.312	0.000	0.000	1.000	0.463
New Finance	41,476	0.540	0.000	1.000	1.000	0.498
Number of Business Operating Segments	41,476	2.890	1.000	1.000	3.000	3.395
Number of Geographic Operating Segments	41,476	3.404	1.000	1.000	3.000	5.075
Operating Cash Flows	41,476	-0.096	-0.036	0.065	0.124	0.730
Return on Assets	41,476	-0.364	-0.140	0.019	0.068	1.876
Rolling SD of Cash Flows	41,476	0.216	0.031	0.059	0.125	0.706
Rolling SD of Revenue	41,476	0.247	0.071	0.141	0.271	0.339
<i>Auditor-Level Controls</i>						
Audit Office Size	41,476	23.377	21.186	24.291	25.923	3.319
Auditor Tenure	41,476	9.695	4.000	7.000	13.000	7.857
BigN	41,476	0.636	0.000	1.000	1.000	0.481
Local Market Industry Leader	41,476	0.426	0.000	0.000	1.000	0.494
National Market Industry Leader	41,476	0.194	0.000	0.000	0.000	0.395

This table provides descriptive statistics for the variables used in subsequent analysis. Variable definitions are provided in Appendix A.

Table 2: Absolute value of abnormal accruals as a function of relative restatement risk.

Variables	Model 1 Absolute Value of Abnormal Accruals	Model 2 Absolute Value of Abnormal Accruals	Model 3 Absolute Value of Abnormal Accruals	Model 4 Absolute Value of Abnormal Accruals	Model 5 Absolute Value of Abnormal Accruals	Model 6 Absolute Value of Abnormal Accruals
<i>Variables of Interest</i>						
<i>Misstatement Risk Bias (Measured Relative to Office)</i>		-0.109 (-5.14)***				-0.077 (-2.83)***
<i>Misstatement Risk Bias (Measured Relative to Office-Industry)</i>			-0.039 (-1.79)*			-0.050 (-2.40)**
<i>Misstatement Risk Bias (Measured Relative to Firm-Industry)</i>				-0.003 (-0.05)		0.045 (0.63)
<i>Misstatement Risk Bias (Measured Relative to Firm)</i>					-0.006 (-0.19)	0.033 (0.59)
<i>Risk-Related Controls</i>						
<i>Misstatement Risk</i>	0.012 (3.22)***	0.015 (3.87)***	0.012 (2.24)**	0.009 (1.66)*	0.012 (3.21)***	0.013 (1.86)*
<i>Median Office Misstatement Risk</i>	-0.028 (-1.60)	-0.059 (-3.05)***	0.005 (0.19)	-0.003 (-0.21)	-0.028 (-1.59)	-0.042 (-1.80)*
<i>Client-Level Controls</i>						
<i>Absolute Value of Abnormal Accruals (t-1)</i>	0.017 (1.61)	0.017 (1.59)	0.093 (4.54)***	0.112 (2.89)***	0.017 (1.61)	0.153 (4.47)***
<i>Age</i>	0.000 (0.49)	0.000 (0.35)	0.000 (0.14)	-0.000 (-0.85)	0.000 (0.49)	-0.000 (-0.30)
<i>Annual Change in Leverage</i>	-0.180 (-11.08)***	-0.181 (-11.12)***	-0.208 (-8.69)***	-0.223 (-6.10)***	-0.180 (-11.08)***	-0.235 (-5.75)***
<i>Annual Stock Return</i>	0.003 (2.45)**	0.003 (2.48)**	0.002 (1.23)	0.002 (1.51)	0.003 (2.45)**	-0.000 (-0.30)
<i>Client Influence</i>	-0.100 (-3.83)***	-0.045 (-1.61)	-0.255 (-1.79)*	-0.095 (-3.74)***	-0.100 (-3.87)***	-0.260 (-1.93)*
<i>Client Size</i>	-0.015 (-5.72)***	-0.015 (-5.62)***	-0.010 (-3.71)***	-0.008 (-3.44)***	-0.015 (-5.72)***	-0.008 (-2.99)***
<i>Going Concern Opinion</i>	0.066 (3.62)***	0.061 (3.32)***	0.065 (2.46)**	0.053 (2.32)**	0.066 (3.62)***	0.055 (2.02)**
<i>Investment</i>	0.065 (2.65)***	0.026 (0.95)	0.087 (3.18)***	0.043 (1.83)*	0.065 (2.65)***	0.027 (0.87)
<i>Leverage</i>	0.065 (7.81)***	0.065 (7.76)***	0.069 (5.32)***	0.076 (4.18)***	0.065 (7.82)***	0.095 (4.48)***
<i>Loss</i>	-0.030 (-4.23)***	-0.035 (-4.91)***	-0.029 (-3.56)***	-0.030 (-3.90)***	-0.030 (-4.23)***	-0.033 (-3.88)***
<i>New Finance</i>	0.031 (4.00)***	0.058 (6.09)***	0.018 (2.10)**	0.021 (2.71)***	0.031 (4.00)***	0.035 (3.19)***
<i>Operating Cash Flows</i>	-0.090 (-3.50)***	-0.092 (-3.59)***	-0.032 (-0.84)	-0.042 (-0.91)	-0.090 (-3.50)***	-0.029 (-0.54)
<i>Return on Assets</i>	-0.032	-0.030	-0.048	-0.046	-0.032	-0.022

	(-2.68)***	(-2.53)**	(-2.56)**	(-1.80)*	(-2.68)***	(-0.86)
<i>Rolling SD of Cash Flows</i>	0.119	0.119	0.187	0.186	0.119	0.274
	(6.03)***	(6.02)***	(4.67)***	(3.41)***	(6.03)***	(4.69)***
<i>Rolling SD of Revenue</i>	0.059	0.060	0.065	0.032	0.059	0.026
	(2.57)**	(2.64)***	(2.08)**	(1.52)	(2.57)**	(1.03)
<u><i>Auditor-Level Controls</i></u>						
<i>Audit Office Size</i>	-0.009	-0.010	-0.008	-0.007	-0.009	-0.010
	(-3.68)***	(-4.02)***	(-2.64)***	(-3.44)***	(-3.68)***	(-3.17)***
<i>Auditor Tenure</i>	-0.000	-0.000	0.000	-0.000	-0.000	-0.000
	(-0.24)	(-0.19)	(0.18)	(-1.22)	(-0.25)	(-0.85)
<i>BigN</i>	-0.004	-0.005	-0.004	-0.003	-0.004	0.003
	(-0.28)	(-0.40)	(-0.25)	(-0.25)	(-0.31)	(0.22)
<i>Local Market Industry Leader</i>	0.004	0.005	0.002	-0.003	0.004	-0.006
	(0.53)	(0.71)	(0.28)	(-0.45)	(0.53)	(-0.80)
<i>National Market Industry Leader</i>	0.008	0.008	0.008	0.003	0.008	0.009
	(1.39)	(1.27)	(1.17)	(0.43)	(1.38)	(1.26)
<i>Observations</i>	41274	41274	24130	31566	41274	22007
<i>R-squared</i>	0.288	0.289	0.314	0.233	0.288	0.250
<i>Industry Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Standard Error Clustering</i>	by firm					

This table models the absolute value of abnormal accruals as a function of relative risk using ordinary least squares regressions. Two-tailed test statistics and significance levels shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 3: Propensity to receive a going concern opinion as a function of relative bankruptcy risk.

Variables	Model 1 Going Concern Opinion	Model 2 Going Concern Opinion	Model 3 Going Concern Opinion	Model 4 Going Concern Opinion	Model 5 Going Concern Opinion	Model 6 Going Concern Opinion
<i>Variables of Interest</i>						
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.979 (8.88)***				1.025 (3.28)***
<i>Bankruptcy Risk Bias (Measured Relative to Office-Industry)</i>			0.546 (4.46)***			-0.214 (-0.73)
<i>Bankruptcy Risk Bias (Measured Relative to Firm-Industry)</i>				0.767 (7.70)***		0.553 (1.72)*
<i>Bankruptcy Risk Bias (Measured Relative to Firm)</i>					0.072 (0.58)	0.588 (1.54)
<i>Risk-Related Controls</i>						
<i>Bankruptcy Risk</i>	0.096 (14.36)***	0.067 (9.03)***	0.106 (7.20)***	0.110 (8.31)***	0.096 (14.36)***	0.093 (5.28)***
<i>Median Office Bankruptcy Risk</i>	0.014 (1.45)	0.054 (5.30)***	0.007 (0.24)	0.033 (1.26)	0.013 (1.42)	0.080 (2.09)**
<i>Client-Level Controls</i>						
<i>Age</i>	-0.002 (-1.09)	-0.002 (-1.09)	-0.005 (-1.31)	0.001 (0.32)	-0.002 (-1.09)	-0.004 (-0.95)
<i>Annual Change in Leverage</i>	0.050 (0.83)	0.070 (1.20)	-0.064 (-0.54)	-0.109 (-1.17)	0.049 (0.83)	-0.035 (-0.26)
<i>Annual Stock Return</i>	-0.006 (-0.88)	-0.004 (-0.65)	0.011 (1.22)	-0.001 (-0.10)	-0.006 (-0.88)	0.014 (1.53)
<i>Client Influence</i>	-0.113 (-0.85)	-0.625 (-4.22)***	-0.178 (-0.10)	-0.362 (-1.24)	-0.102 (-0.76)	0.301 (0.15)
<i>Client Size</i>	-0.159 (-9.96)***	-0.162 (-10.16)***	-0.232 (-7.59)***	-0.195 (-8.96)***	-0.159 (-9.97)***	-0.250 (-7.57)***
<i>Investment</i>	-1.170 (-11.53)***	-1.153 (-11.28)***	-1.590 (-8.57)***	-1.652 (-10.73)***	-1.170 (-11.53)***	-1.536 (-7.37)***
<i>Leverage</i>	-0.177 (-4.72)***	-0.179 (-5.05)***	-0.155 (-1.75)*	-0.198 (-2.56)**	-0.177 (-4.74)***	-0.193 (-1.82)*
<i>Loss</i>	0.256 (5.53)***	0.223 (4.72)***	0.172 (1.95)*	0.160 (2.62)***	0.256 (5.53)***	0.119 (1.25)
<i>New Finance</i>	0.135 (3.49)***	0.105 (2.66)***	0.317 (4.08)***	0.291 (5.09)***	0.135 (3.48)***	0.172 (1.89)*
<i>Operating Cash Flows</i>	-0.392 (-5.03)***	-0.380 (-5.13)***	-0.759 (-4.02)***	-0.747 (-5.36)***	-0.392 (-5.05)***	-0.722 (-3.62)***
<i>Return on Assets</i>	0.042 (1.62)	0.035 (1.39)	0.161 (2.80)***	0.186 (3.68)***	0.042 (1.62)	0.154 (2.50)**
<i>Rolling SD of Cash Flows</i>	-0.051 (-1.00)	-0.041 (-0.84)	-0.400 (-1.83)*	-0.222 (-1.73)*	-0.051 (-1.00)	-0.353 (-1.57)
<i>Rolling SD of Revenue</i>	0.031	0.040	-0.112	-0.156	0.031	-0.226

<i>Auditor-Level Controls</i>	(0.48)	(0.63)	(-0.72)	(-1.42)	(0.47)	(-1.28)
<i>Audit Office Size</i>	0.010 (0.77)	0.000 (0.03)	-0.008 (-0.25)	0.009 (0.49)	0.010 (0.79)	-0.017 (-0.54)
<i>Auditor Tenure</i>	-0.004 (-0.98)	-0.003 (-0.79)	0.001 (0.24)	-0.003 (-0.59)	-0.004 (-0.96)	0.000 (0.05)
<i>BigN</i>	0.014 (0.20)	-0.017 (-0.24)	0.146 (1.05)	-0.009 (-0.10)	0.017 (0.23)	0.176 (1.18)
<i>Local Market Industry Leader</i>	0.095 (2.20)**	0.086 (1.95)*	0.048 (0.65)	0.143 (2.63)***	0.096 (2.21)**	0.050 (0.63)
<i>National Market Industry Leader</i>	0.005 (0.10)	-0.003 (-0.06)	-0.073 (-0.87)	0.010 (0.17)	0.006 (0.11)	-0.073 (-0.85)
Observations	14193	14193	5915	10701	14193	5618
Pseudo R-squared	0.245	0.256	0.301	0.282	0.245	0.317
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Standard Error Clustering	by firm	by firm	by firm	by firm	by firm	by firm

This table models the propensity for a client to receive a going concern opinion as a function of relative risk using probit regressions. Two-tailed test statistics and significance levels shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 4: Audit fees as a function of relative restatement and bankruptcy risk.

Variables	Model 1 Log of Audit Fees	Model 2 Log of Audit Fees
<i>Variables of Interest</i>		
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	0.136 (6.24)***	
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.192 (8.02)***
<i>Risk-Related Controls</i>		
<i>Misstatement Risk</i>	0.005 (3.64)***	
<i>Bankruptcy Risk</i>		0.017 (9.33)***
<i>Median Office Misstatement Risk</i>	0.005 (0.27)	
<i>Median Office Bankruptcy Risk</i>		-0.009 (-3.51)***
<i>Client-Level Controls</i>		
<i>Absolute Value of Abnormal Accruals (t-1)</i>	-0.001 (-0.94)	-0.002 (-1.48)
<i>Age</i>	0.002 (3.27)***	0.002 (2.78)***
<i>Annual Change in Leverage</i>	-0.001 (-0.20)	0.002 (0.49)
<i>Annual Stock Return</i>	0.001 (0.95)	0.001 (1.71)*
<i>Client Influence</i>	0.021 (0.55)	-0.034 (-0.89)
<i>Client Size</i>	0.493 (109.14)***	0.494 (110.24)***
<i>December 31st Fiscal Year End</i>	0.092 (6.59)***	0.087 (6.26)***
<i>Going Concern Opinion</i>	0.203 (11.82)***	0.109 (6.10)***
<i>Investment</i>	-0.042 (-1.49)	-0.043 (-1.59)
<i>Leverage</i>	0.028 (8.07)***	0.015 (4.25)***
<i>Loss</i>	0.165 (16.63)***	0.114 (11.68)***
<i>New Finance</i>	0.014 (1.36)	0.013 (1.53)
<i>Number of Business Operating Segments</i>	0.004 (2.27)**	0.005 (2.56)**
<i>Number of Geographic Operating Segments</i>	0.018 (14.11)***	0.018 (14.58)***
<i>Operating Cash Flows</i>	-0.131 (-12.00)***	-0.104 (-9.17)***
<i>Return on Assets</i>	-0.017 (-3.59)***	-0.008 (-1.62)
<i>Rolling SD of Cash Flows</i>	-0.029 (-3.02)***	-0.020 (-2.07)**
<i>Rolling SD of Revenue</i>	0.205 (11.52)***	0.182 (10.33)***
<i>Auditor-Level Controls</i>		
<i>Audit Office Size</i>	0.061 (15.45)***	0.056 (13.81)***
<i>Auditor Tenure</i>	-0.001 (-0.52)	-0.000 (-0.11)
<i>BigN</i>	0.149 (6.57)***	0.147 (6.51)***
<i>Local Market Industry Leader</i>	-0.028 (-2.38)**	-0.031 (-2.65)***
<i>National Market Industry Leader</i>	0.004 (0.26)	0.004 (0.26)
Observations	41274	41274
R-squared	0.864	0.866
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Standard Error Clustering	by firm	by firm

This table models the log of audit fees as a function of relative risk using ordinary least squares regressions. Two-tailed test statistics and significance levels shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 5:

Panel A: Propensity to switch auditors as a function of relative restatement and bankruptcy risk.

Variables	Model 1 Switch	Model 2 Switch	Model 3 Switch	Model 4 Switch
<i>Variables of Interest</i>				
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	0.260 (7.08)***			
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.192 (4.54)***		
<i>Three Year Change in Misstatement Risk Bias</i>			0.155 (4.68)***	
<i>Three Year Change in Bankruptcy Risk Bias</i>				0.096 (2.85)***
<i>Risk-Related Controls</i>				
<i>Misstatement Risk</i>	-0.006 (-1.70)*		-0.001 (-0.17)	
<i>Bankruptcy Risk</i>		-0.016 (-4.86)***		-0.013 (-3.89)***
<i>Median Office Misstatement Risk</i>	0.103 (2.52)**		0.083 (1.77)*	
<i>Median Office Bankruptcy Risk</i>		0.053 (11.36)***		0.051 (10.40)***
<i>Client-Level Controls</i>				
<i>Absolute Value of Abnormal Accruals</i>	0.045 (2.13)**	0.046 (2.14)**	0.022 (0.86)	0.053 (2.31)**
<i>Acquisition</i>	-0.148 (-6.53)***	-0.113 (-5.04)***	-0.157 (-6.06)***	-0.121 (-4.98)***
<i>Asset Growth</i>	0.000 (1.18)	0.000 (0.99)	0.000 (0.51)	0.000 (0.89)
<i>Cash</i>	-0.147 (-3.00)***	-0.232 (-5.05)***	-0.242 (-4.50)***	-0.264 (-5.46)***
<i>Going Concern Opinion</i>	0.253 (8.05)***	0.211 (5.89)***	0.245 (6.45)***	0.201 (5.15)***
<i>Inventory and Receivables</i>	0.008 (0.40)	0.005 (0.25)	-0.013 (-1.00)	-0.012 (-0.98)
<i>Leverage</i>	0.003 (0.61)	0.003 (0.49)	-0.012 (-1.74)*	-0.004 (-0.67)
<i>Loss</i>	0.097 (4.53)***	0.071 (3.20)***	0.122 (4.96)***	0.107 (4.51)***
<i>Mismatch</i>	-0.102 (-4.86)***	-0.073 (-3.44)***	-0.122 (-5.07)***	-0.067 (-2.92)***
<i>Modified Report (Other Than GCAR)</i>	-0.189 (-8.20)***	-0.182 (-7.86)***	-0.275 (-10.12)***	-0.244 (-9.54)***
<i>Return on Assets</i>	-0.012 (-1.66)*	-0.011 (-1.48)	-0.035 (-3.63)***	-0.018 (-2.26)**
<i>Auditor-Level Controls</i>				
<i>Auditor Tenure</i>	-0.092 (-20.88)***	-0.093 (-20.93)***	-0.084 (-18.75)***	-0.084 (-19.34)***
<i>Local Market Industry Leader</i>	-0.220 (-10.76)***	-0.206 (-10.05)***	-0.230 (-9.49)***	-0.213 (-9.43)***
<i>National Market Industry Leader</i>	-0.357 (-13.76)***	-0.346 (-13.40)***	-0.401 (-12.58)***	-0.396 (-13.07)***
Observations	41468	41468	32856	36859
Pseudo R-squared	0.178	0.181	0.174	0.173
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Standard Error Clustering	by firm	by firm	by firm	by firm

This table models the propensity for a client to switch auditors as a function of relative risk using probit regressions. Two-tailed test statistics and significance levels shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Panel B: Change in relative risk after an change in auditors

Change in Relative Risk After Auditor Switch:	Mean	Median
Restatement Risk Relative to Office	-0.078***	-0.075***
Bankruptcy Risk Relative to Office	-0.092***	-0.079***

This table shows the man and median change in clients' relative risk following a change in auditor. *** Indicates a significant difference from zero at p<.01. Variable definitions are provided in Appendix A.

Table 6: Positive and negative bias modeled separately.

Variables	Model 1 Absolute Value of Abnormal Accruals	Model 2 Log of Audit Fees	Model 3 Switch	Model 4 Going Concern Opinion	Model 5 Log of Audit Fees	Model 6 Switch
<i>Variables of Interest</i>						
<i>Misstatement Risk Bias (Positive)</i>	-0.044 (-2.68)***	0.167 (5.87)***	0.120 (2.12)**			
<i>Misstatement Risk Bias (Negative)</i>	0.098 (5.76)***	-0.110 (-4.09)***	-0.418 (-6.94)***			
<i>Bankruptcy Risk Bias (Positive)</i>				1.044 (7.93)***	0.257 (8.50)***	0.141 (2.47)**
<i>Bankruptcy Risk Bias (Negative)</i>				-0.837 (-4.29)***	-0.131 (-4.34)***	-0.261 (-3.91)***
Difference [abs(Positive) - abs(Negative)]	-0.054***	0.057***	-0.298**	0.207	0.126**	-0.12*
Observations	41274	41274	41468	14193	41274	41468
R-squared	0.299	0.864			0.866	
Pseudo R-squared			0.178	0.256		0.181
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Standard Error Clustering	by firm	by firm	by firm	by firm	by firm	by firm

This table reperforms the primary tests from tables 3, 4, 5, and 6 using separate variables to capture positive and negative relative risk. Models 3, 4, and 6 use probit regressions, all other models use ordinary least squares regressions. Control variables are included but not shown to conserve space. Two-tailed test statistics and significance levels are shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10.

Table 7: Client outcomes as a function of relative restatement and bankruptcy risk.

Variables	Model 1 Restatement	Model 2 Bankruptcy (t+1)
<i>Variables of Interest</i>		
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.018 (-0.41)	
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.494 (1.60)
<i>Risk-Related Controls</i>		
<i>Misstatement Risk</i>	0.008 (2.28)**	
<i>Bankruptcy Risk</i>		0.145 (4.74)***
<i>Median Office Misstatement Risk</i>	0.073 (1.79)*	
<i>Median Office Bankruptcy Risk</i>		-0.011 (-0.40)
<i>Client-Level Controls</i>		
<i>Absolute Value of Abnormal Accruals (t-1)</i>	0.001 (0.33)	
<i>Age</i>	-0.005 (-5.68)***	-0.008 (-1.82)*
<i>Annual Change in Leverage</i>	-0.021 (-1.57)	0.068 (0.57)
<i>Annual Stock Return</i>	0.001 (0.48)	-0.183 (-3.61)***
<i>Client Influence</i>	0.058 (0.89)	0.295 (0.95)
<i>Client Size</i>	0.053 (8.30)***	0.218 (6.37)***
<i>Going Concern Opinion</i>	-0.073 (-2.01)**	1.488 (14.57)***
<i>Investment</i>	-0.151 (-3.07)***	-0.268 (-1.03)
<i>Leverage</i>	0.003 (0.39)	-0.273 (-1.77)*
<i>Loss</i>	0.049 (2.41)**	0.272 (2.46)**
<i>New Finance</i>	0.064 (2.89)***	0.116 (1.12)
<i>Operating Cash Flows</i>	0.016 (0.60)	-0.203 (-1.57)
<i>Return on Assets</i>	-0.023 (-2.21)**	0.614 (3.88)***
<i>Rolling SD of Cash Flows</i>	0.017 (0.94)	0.056 (0.64)
<i>Rolling SD of Revenue</i>	0.070 (2.34)**	0.061 (0.42)
<i>Auditor-Level Controls</i>		
<i>Audit Office Size</i>	-0.015 (-2.45)**	-0.015 (-0.48)
<i>Auditor Tenure</i>	0.003 (1.85)*	-0.005 (-0.61)
<i>BigN</i>	0.083 (2.40)**	0.064 (0.37)
<i>Local Market Industry Leader</i>	-0.026 (-1.32)	-0.086 (-0.87)
<i>National Market Industry Leader</i>	0.048 (2.10)**	0.174 (1.55)
Observations	41202	13546
Pseudo R-squared	0.057	0.401
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Standard Error Clustering	by firm	by firm

Column one of this table models the propensity for a client to restate the current year financials as a function of relative restatement risk using a probit regression. Column two of this table models the propensity for a client to go bankrupt in the following year as a function of relative bankruptcy risk using a probit regression. Two-tailed test statistics and significance levels are shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 8: Propensity Score Matching

Panel A: Results of matching

	Before Match				After Match			
	Mean Treated	Mean Control	Difference	Bias	Mean Treated	Mean Control	Difference	Bias
<i>Restatement Risk Matching</i>								
Restatement Risk	1.799	0.688	1.111***	36%	1.799	1.728	0.071*	8%
Median Office Restatement Risk	0.558	0.566	-0.008***	-3%	0.558	0.553	0.005	2%
Client Size	18.516	19.097	-0.581***	-23%	18.516	18.494	0.022	1%
Office Size	22.425	23.691	-1.266***	-37%	22.425	22.351	0.074	2%
Big N	0.589	0.651	-0.062***	-13%	0.589	0.586	0.003	7%
<i>Bankruptcy Risk Matching</i>								
Bankruptcy Risk	1.811	-0.728	2.539***	66%	1.811	1.691	0.12*	4%
Median Office Bankruptcy Risk	-0.853	-0.648	-0.205***	-10%	-0.853	-0.872	0.019	2%
Client Size	18.200	18.394	-0.194***	-11%	18.200	18.281	-0.081*	-6%
Office Size	23.230	23.188	0.042	1%	23.230	23.200	0.03	1%
Big N	0.671	0.549	0.122***	25%	0.671	0.677	-0.006	-4%

This table provides differences in for key variables between treatment and control samples, both before and after matching. Treatment firms are those in the top quartile of relative risk. Control firms are those in the bottom three quartiles of relative risk. Two-tailed test statistics and significance levels are shown for all differences. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Panel B: Performance of tests in tables 3, 4, 5, and 6 using a matched sample.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variables	Absolute Value of Abnormal Accruals	Log of Audit Fees	Switch	Going Concern Opinion	Log of Audit Fees	Switch
Misstatement Risk Bias (Measured Relative to Office)	-0.064 (-3.39)***	0.087 (2.92)***	0.257 (4.24)***			
Bankruptcy Risk Bias (Measured Relative to Office)				1.137 (7.09)***	0.198 (4.01)***	0.475 (3.71)***
Observations	17153	17153	17221	7003	7049	7023
R-squared	0.314	0.858			0.812	
Pseudo R-squared			0.169	0.248		0.224
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Standard Error Clustering	by firm	by firm	by firm	by firm	by firm	by firm

This table provides the results of performing the primary tests from tables 3, 4, 5, and 6 using a matched sample. Models 3, 4, and 6 use probit regressions, all other models use ordinary least squares regressions. Control variables are included but not shown to conserve space. Two-tailed test statistics and significance levels are shown for all variables. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 9: Cross-sectional test

Panel A	Small Audit Office (Stronger Predicted Effect)		Large Audit Office (Weaker Predicted Effect)		Difference
Variables	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.105 (-8.26)***		-0.056 (-2.01)**		-0.049**
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.933 (8.24)***		0.785 (1.50)	0.148
Panel B	Non-Big 4 Auditor (Stronger Predicted Effect)		Big 4 Auditor (Weaker Predicted Effect)		Difference
Variables	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.138 (-4.16)***		-0.078 (-9.39)***		-0.06**
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.815 (5.49)***		0.264 (2.64)***	0.551***
Panel C	Low Tenure (Stronger Predicted Effect)		High Tenure (Weaker Predicted Effect)		Difference
Variables	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.101 (-3.22)***		-0.066 (-5.95)***		-0.035
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		1.132 (5.81)***		0.923 (6.62)***	0.209
Panel D	Low Influence Client (Stronger Predicted Effect)		High Influence Client (Weaker Predicted Effect)		Difference
Variables	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.092 (-7.74)***		-0.065 (-4.51)***		-0.027*
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		1.601 (7.44)***		0.675 (4.88)***	0.926***
Panel E	Non-Industry Leader Auditor (Stronger Predicted Effect)		Industry Leader Auditor (Weaker Predicted Effect)		Difference
Variables	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.099 (-4.19)***		-0.062 (-5.45)***		-0.037*
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		0.957 (7.13)***		0.217 (1.85)*	0.74***

Panel F Variables	Pre-SOX (Stronger Predicted Effect)		Post-SOX (Weaker Predicted Effect)		Difference
	Absolute Value of Abnormal Accruals	Going Concern	Absolute Value of Abnormal Accruals	Going Concern	
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.100 (-3.77)***		-0.065 (-5.48)***		-0.035*
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		1.318 (6.94)***		0.759 (5.39)***	0.559***

This table examines auditor risk assessment bias cross-sectionally. Additional controls are included in the models but not tabulated to conserve space. Two-tailed test statistics and significance levels shown for all variables in table. Differences between the magnitude of coefficients across partitions are provided in the last column, and significance levels are indicated. Statistical significance is denoted as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

Table 10: Test of DDAR's impact on bias at Deloitte

Variables	Model 1 Absolute Value of Abnormal Accruals	Model 2 Going Concern Opinion
<i>Variables of Interest</i>		
<i>Misstatement Risk Bias (Measured Relative to Office)</i>	-0.076 (-5.22)***	
<i>Misstatement Risk Bias * Deloitte * Post</i>	0.035 (2.18)**	
<i>Bankruptcy Risk Bias (Measured Relative to Office)</i>		1.247 (4.15)***
<i>Bankruptcy Risk Bias * Deloitte * Post</i>		-0.842 (-2.12)**
<i>Other Variables</i>		
<i>Misstatement Risk Bias * Post</i>	-0.010 (-0.83)	
<i>Misstatement Risk Bias * Deloitte</i>	-0.005 (-0.82)	
<i>Bankruptcy Risk Bias * Post</i>		-0.309 (-0.92)
<i>Bankruptcy Risk Bias * Deloitte</i>		-0.039 (-0.06)
<i>Deloitte</i>	0.006 (0.98)	-0.078 (-0.20)
<i>Post</i>	0.058 (1.59)	0.810 (3.41)***
<i>Deloitte * Post</i>	0.000 (0.07)	-0.029 (-0.07)
Observations	26258	8257
R-squared	0.345	
Pseudo R-squared		0.304
Other Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Standard Error Clustering	by firm	by firm

This table uses a difference in difference approach to test whether the implementation of DDAR coincided with a reduction in risk assessment bias for Deloitte relative to the other Big 4 audit firms. Additional controls are included in the models but not tabulated to conserve space. Two-tailed test statistics and significance levels shown for all variables in table. Statistical significance is indicated as follows: *** p<.01, ** p<.05, *p<.10. Variable definitions are provided in Appendix A.

VITA

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