June 2022

# Do Auditors Respond to Changes in Clients' Analyst Coverage? Evidence from a Natural Experiment

Mohammad Alkhamees
*University of South Florida*

# Do Auditors Respond to Changes in Clients' Analyst Coverage? Evidence from a Natural Experiment

by

Mohammad Alkhamees

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Business Administration
with a concentration in Accountancy
Lynn Pippenger School of Accountancy
Muma College of Business
University of South Florida

Major Professor: Dahlia Robinson, Ph.D.
Carlos Jimenez-Angueira, Ph.D.
Tom Smith, Ph.D.
Ninon Sutton, Ph.D.

Date of Approval:
June 1st, 2022

Keywords: Brokerage Merger/Closure, Information Asymmetry, Auditor Effort, Financial Reporting Quality

## ACKNOWLEDGEMENTS

I would like to express my deepest appreciation to my supervisor Dr. Dahlia Robinson for her invaluable supervision, support, and patience during my Ph.D. study at the University of South Florida. Her immense knowledge, expertise, and feedback helped me throughout the research journey.

I would also like to extend my appreciation to my committee members; Dr. Ninon Sutton, Dr. Carlos Jimenez Angueira, and Dr. Tom Smith for their guidance and feedback throughout the research process.

I am also grateful to my many colleagues at USF, especially my cohort members for all the good times and support we had together. I am especially grateful to Juliana Kralik and Rich Mautz for their feedback and time during the writing of this dissertation.

I could not have undertaken this journey without my family and friends support, especially my parents who encouraged me and stood beside me throughout my entire academic journey.

Lastly, and most importantly, my Ph.D. journey would not have been possible without the company of my wife Aisha Alkhunaini, who supported me throughout my studies.

## TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## ABSTRACT

Prior research has established that analysts serve as an important monitor of management and improve the quality of firms' financial reporting. In this study, I utilize the natural experiment resulting from the mergers and closures of brokerage houses, to examine whether this exogenous change in firms' information environment impacts the audit process. Specifically, I examine whether reductions in analyst coverage have an effect on auditor effort proxied by audit fees and audit report lag, as well as financial reporting quality, measured by future restatements. I find that client firms pay significantly higher audit fees following an exogenous reduction in analyst coverage but do not experience delays in issuance of audit reports, suggesting that the increase in auditor effort does not compromise audit report timeliness. On average, losing coverage from one analyst translates into a 5.2% increase in audit fees. In the high information asymmetry sample (i.e., firms in the lowest analyst coverage tercile), losing coverage from one analyst translates into a 7.8% increase in audit fees. Further, client firms are more likely to restate their financial statement following a decrease in analyst coverage, which is consistent with prior research findings that firms financial reporting quality deteriorate following a decrease in analyst coverage. Collectively, these results suggest that auditors respond quickly to changes in clients' information environment.

# CHAPTER ONE:

# INTRODUCTION

I examine whether changes in analyst coverage affect the audit process. Specifically, I look at the effect of an exogenous decrease in analyst coverage on audit fees, audit report lag, and the probability of future restatements. Prior literature has shown that analysts affect the information environment of the firms they follow and influence managers financial reporting behaviors (e.g., LaFond and Roychowdhury 2008; Yu 2008; Irani and Oesch 2016) which in turn may affect the audit process (Gotti, Han, Higgs, and Kang 2012). Therefore, in this study, I investigate whether the loss of analyst coverage has any attendant effect on the audit process. While analyst coverage is potentially endogenous, I utilize a natural experiment setting resulting from brokerage houses mergers and closures, which generate exogenous variation in analyst coverage (Hong and Kacperczyk 2010; Kelly and Ljungqvist 2012). This exogenous shock alleviates the endogeneity concerns that have limited prior research from examining the direct effect of analyst coverage on the audit process. While firms disseminate information to investors through financial statements, verifying financial statements is costly for individual investors, which create a demand for independent third-party verification who can objectively monitor public firms and alleviate agency problems resulting from the separation of ownership and control (Jensen and Meckling 1976). External auditors and financial analysts play a major role in mitigating agency costs by assuming the role of information intermediaries between management and owners. Specifically, auditors audit the information contained in published financial

statements and attest to its faithful representation of client information, while analysts closely follow corporate activities and issue earnings forecasts that investors can rely on.

Auditors serve as an information intermediary as part of their informational role in capital markets (i.e., assurance role). Auditors have a greater access to private information than investors and provide independent verification of manager-prepared financial statements (Watts and Zimmerman 1981). This role demands greater transparency from the client which is potentially subject to varying levels of information asymmetry (Willenborg 1999). Because information comes to investors directly from managers, an agency conflict arises from the fact that managers, who are being monitored by investors, are the ones disclosing information to investors. This agency conflict creates a demand for auditors as an independent third party who can objectively audit information disclosed by managers and protect the interest of investors. Ultimately, auditors' assurance role affects the information environment of their clients positively by mitigating agency costs and reducing the information gap between managers and investors. Moreover, auditors have an insurance role in capital markets. Because investors often use audited financial statements as the basis for asset-allocation decisions, the insurance role provides investors with a claim on the auditors in the event of an audit failure (Mansi, Maxwell, and Miller 2004). Overall, auditors add value to capital markets by reducing the information asymmetry gap between managers and investors and providing investors with some protection against possible future losses (Mansi et al. 2004).

Financial analysts on the other hand can add value to firms by reducing agency costs associated with the separation of ownership and control (Jensen and Meckling 1976). Analysts extensive finance and industry knowledge along with access to resources that facilitate their ability to reproduce high quality research, make them well suited to act as information

intermediary who bridge the information asymmetry gap between management and outside investors (i.e., analyst informational role). While most of the input used in analyst research comes from public sources, analysts' superior ability to process complex information in a timely manner and communicate their opinions to less informed investors can contribute greatly to improving the overall information environment of the firms they follow. Prior studies have shown that analysts play a role in shaping the corporate information environment (Lang, Lins, and Miller 2004; Beyer, Cohen, Lys, and Walther 2010). Specifically, prior research suggests that firms with larger analyst following are less likely to manage their earnings (Yu 2008). These firms benefit by having lower audit fees (Gotti et al. 2012).

Moreover, analysts act as an additional monitoring device to the firms they cover by interacting with management on a regular basis and raising various questions about corporate strategy and earnings numbers during earnings release conference calls (i.e., analyst monitoring role). While analysts do not directly monitor managements' activities, their reproduction and analysis of public and private information that are distributed to investors through research reports and other media outlets, can make management's (mis)behavior more visible to shareholders (Healy and Palepu 2001; Lang et al. 2004). In fact, analysts appear to limit managerial opportunism in various ways, including reducing information risk in financial reporting. Consistent with this significant monitoring role, Dyck, Morse, and Zingales (2010) assert that when financial reports are inspected by analysts, managers are less likely to engage in fraudulent financial reporting.

Additionally, the extant research provides robust evidence that analysts play an important role in mitigating firms' agency problems, not only through their ability to summarize and distribute information to investors (i.e., analyst informational role) but also through their

presence to affect information quality (i.e., analyst monitoring role). However, a major concern with prior research findings is the potential endogeneity of analyst coverage. That is, analysts could choose to cover well governed firms, which could drive the effect found in previous studies. Therefore, examining changes of analyst coverage on the audit process might be problematic because of the potential endogeneity problems arising from the fact that agency costs variables (i.e., analyst coverage) are choice variables (DeFond and Zhang 2014). The existing literature has shown that analysts tend to cover firms with a better information environment and less severe agency problems (e.g., Lang and Lundholm 1996; Francis, Hanna, and Philbrick 1997; Bushman, Piotroski, and Smith 2005). Unobservable firm heterogenous characteristics that could be correlated with analyst coverage and the firms they follow could potentially result in biased coefficient estimates.

To examine the direct effect of analyst coverage on the audit process and overcome endogeneity concerns, I rely on two sources of exogenous shocks to analyst coverage that reduced the number of analysts following specific firms. The first shock is brokerage house mergers (Hong and Kacperczyk 2010), where both houses cover the same stock before the merger and the surviving entity continue to cover that stock after the merger is completed. This will result in two analysts covering the same stock and one of them will be dismissed to reduce redundancy and avoid culture clash (Wu and Zang 2009). The second shock is brokerage house closures (Kelly and Ljungqvist 2012), where broker houses decide to close their business and dismiss all of their employed analysts, which in turn will affect all covered firms regardless of their heterogenous characteristics. A key advantage of exploiting this natural experiment (i.e., broker exits) is that it not only resolves endogeneity concerns, but also deals with the omitted

variable problem, by allowing multiple shocks to affect different firms at different times (Chen, Harford, and Lin 2015).

Prior studies find that the exogenous reduction in analyst coverage increases firms' cost of capital (Kelly and Ljungqvist 2012), increases earnings management activities (Irani and Oesch 2016), decreases investment efficiency and the quality of corporate governance (Chen et al. 2015), decreases investment and financing activities (Derrien and Kecskes 2013), and reduces stock liquidity (Balakrishnan, Billings, Kelly, and Ljungqvist 2014). More recent studies also find that the exogenous reduction in analyst coverage increases the likelihood of disclosing non-GAAP earnings per share (EPS) numbers (Christensen, Gomez, Ma, and Pan 2021), increases aggressive corporate tax planning (Chen, Chiu, and Shevlin 2018), increases firms' ex ante expected crash risk (Kim, Lu, and Yu 2019), and increases firms' likelihood of switching to higher quality auditors (Fung, Wang, Zhang, and Zhu 2022). Collectively, these findings suggest that a decrease in analyst coverage exacerbate firms' agency problems which increases information asymmetry.

Analysts serve as external monitors to the firms they follow, and their presence helps reduce the level of information asymmetry. As the loss of analyst coverage reduces the supply of public information and decreases external monitoring, I posit that auditors, could adjust their assessment of the audit engagement and its required effort (i.e., audit fees) when the level of analyst coverage changes, potentially signaling an increase in information asymmetry. Further, I examine whether the audit report timeliness (audit report lag) is negatively affected after the exogenous changes in analyst coverage, since audit report lag can also capture auditor effort (Knechel and Payne 2001; Knechel, Rouse, and Schelleman 2009). Therefore, it is important to rely on multiple proxies to examine changes in auditor effort (DeFond and Zhang 2014). Finally,

I expect the probability of future restatements to increase following a reduction in analyst coverage. Since prior research finds evidence that firms' financial reporting quality deteriorates after exogenous changes in analyst coverage when using (real)earnings management as their proxy for financial reporting quality (Irani and Oesch 2016; Chen et al. 2015), I extend the literature by examining whether such deterioration can also be captured by the probability of a future restatement. A major advantage of relying on future restatements as a proxy for financial reporting quality is that restatement is also a very direct measure of the actual audit quality that uses an output of the audit process and is associated with lower measurement errors relative to several other measures (DeFond and Zhang 2014).

Although there is a fairly rich literature focusing on the impact of these exogenous analyst changes, to date, there is only one other study that has examined the effect, if any, of these events on the audit process. Fung et al. (2022) examine the effect of coverage shocks on the demand for audit quality and find that firms are more likely to switch to higher quality auditor following reductions in analyst coverage. My study differs from Fung et al. (2022) in two major aspects. First, Fung et al. (2022) motivate their study purely from agency problem perspective, whereas my study examines whether the auditor responds to deteriorations in financial reporting quality documented in prior studies (e.g., Chen et al. 2015; Irani and Oesch 2016) that could have an impact on the audit process. Second, Fung et al. (2022) focus on clients' reaction to reductions in coverage and whether they demand higher quality audits to substitute for lost coverage. However, my study focuses on the auditors' response rather than the client. Accordingly, I fill this gap in the literature by examining whether exogenous changes in analyst coverage affect (1) audit fees, (2) audit report lag, and (3) financial reporting quality.

To identify firms affected by broker exits for the period 2000 to 2008, I obtain a list of brokerage mergers from Hong and Kacperczyk (2010) and a list of brokerage closures from Kelly and Ljungqvist (2012). For mergers, I require affected firms to be covered by both brokers one year before the merger and continue to be covered by the surviving entity one year after the merger. For closures, I require affected firms to be covered by the closed broker in the year preceding the closure and continue to be covered by other analysts one year after the closure.[1] I then merge the list of affected firms with the intersection of COMPUSTAT and Audit Analytics and keep firms that have the required variables in both the pre (t-1) and post (t+1) periods which result in a final sample of 1,814 firm-year observations. The decision to keep only the pre and post years is consistent with prior literature (e.g., Chen et al. 2015; Chen et al. 2018; Christensen et al. 2020; Kim et al. 2019) and allows me to ensure that I am likely only capturing the direct effect of exogenous changes in analyst coverage on the audit process.

I find evidence of increased auditor effort after an exogenous decrease in analyst coverage. Specifically, I find that auditors charge higher fees in the period after broker exits. On average, losing coverage from one analyst translates into a 5.2% increase in audit fees, increasing average audit fees by approximately $161 thousand. Cross-sectionally, I find that the effect is driven primarily by firms covered by a small number of analysts or firms with lower institutional ownership. For those firms, losing coverage from one analyst translates into a 7.8% increase in audit fees, increasing average audit fees by approximately $109 thousand. This is consistent with prior research findings that suggest that information asymmetry levels increase following a decrease in analyst coverage, and this is particularly strong for firms with initial high levels of information asymmetry. Thus, auditors respond to changes in client firms' information

[1] A detailed explanation of the sample construction can be found in the research design section.

environment by increasing effort. Further, I find no significant effect on audit report lag after the exogenous decrease in analyst coverage. Auditors increase effort by charging higher fees without any resultant effect on audit report timeliness. Finally, I find that the probability of a restatement increases following a decrease in analyst coverage. The results are not only consistent with prior literature that documents deterioration in financial reporting quality after a decrease in analyst coverage (e.g., Irani and Oesch 2016; Chen et al. 2015), but also provide additional evidence that audit quality deteriorates as evident by the increased probability of future restatements. Cross-sectionally, I find that the effect is mainly driven by firms with lower institutional ownership indicating that these firms are the most vulnerable to changes in analyst coverage because of their inherent high agency costs.

The findings of this study contribute to the literature in the following ways. First, I extend the literature on the association between audit fees and corporate governance (Abbott, Parker, Peters, and Raghunandan 2003; Bedard and Johnstone 2004; Carcello, Hermanson, Neil, and Riley Jr 2002). While the prior literature has focused on board and audit committee characteristics (Gotti et al. 2012), I show that analyst monitoring affects audit fees. The results suggest that auditors perceive lower audit risk when financial analysts monitor the firm and respond by charging higher fees when analysts stop following the firm. In fact, effective external monitoring is not only helping firms lower their cost of capital (Ashbaugh, Collins, and LaFond 2004) and increase their value (Gompers, Ishii, and Metrick 2003) but is also helping them reduce the amount of fees paid to the auditor.

Second, I empirically show that auditors consider analyst coverage as an important information intermediary whose presence improves the information environment of the firms they cover. Analysts reduce the level of information asymmetry and the results indicate that

auditors carefully consider the information environment of audited firms and respond promptly to sudden changes in information asymmetry levels. Presumably, when the number of analysts following a firm suddenly decreases, auditors revisit their engagement risk assessment and increase their effort which can be captured by increased audit fees. Another explanation is that auditors charge higher audit fees when they anticipate an increase in litigation risk (Lobo and Zhao 2013). The results indicate that firms can save on audit fees by attracting more analyst coverage whose presence serves as a costless external monitoring device that can improve the overall information environment of the firms they cover.

Finally, I contribute to the growing body of literature that rely on natural experiments to establish causality and overcome endogeneity concerns (Hong and Kacperczyk 2010; Kelly and Ljungqvist 2012). Exploiting broker exits as an exogenous shock helps isolate the effect of information asymmetry on the audit process. My study contributes to the literature by examining the role of analysts as external monitors, and how their presence affects the audit process. The results of this study provide further evidence that exogenous reductions in analyst coverage increase firm's agency problems, resulting in increased information asymmetry (e.g., Irani and Oesch 2016; Christensen et al. 2021; Kim et al. 2019).

The remainder of the paper is organized as follows, section 2 reviews related literature and develops research hypotheses. Section 3 presents research design and sample collection. Section 4 presents results and robustness checks. Section 5 concludes.

## CHAPTER TWO:

## PRIOR RESEARCH AND HYPOTHESIS DEVELOPMENT

### *2.1. Analyst monitoring and broker exits*

Analysts play an important role as information intermediaries in capital markets. Investors rely on analysts to analyze financial statements, issue earnings forecasts, critique corporate policy, and, most importantly, recommend buying, holding, or selling a stock (Francis and Soffer 1997; Asquith, Mikhail, and Au 2005; Huang, Zang, and Zheng 2014). Most prior research on analysts have focused on how analysts apply extensive pressure on managers to meet their overly optimistic earnings expectations and have examined how analysts pressure increases firms' agency problems (e.g., Das, Levine, and Sivaramakrishnan 1998; Gu and Wu 2003; and Ke and Yu 2006). However, Chen et al. (2015) argues that endogeneity concerns have limited the prior research from examining the direct effect of analyst coverage on corporate governance. More recent studies have exploited a natural experiment setting (i.e., broker exits) where the effect of analyst coverage can be isolated and clearly measured without encountering these endogeneity concerns. Specifically, these studies exploit the exogenous decrease in the number of analysts covering a firm as a result of brokerage mergers and closures (Hong and Kacperczyk 2010; Kelly and Ljungqvist 2012). Following exogenous decreases in analyst coverage, firms engage in (real)earnings management activities (Irani and Oesch 2016; Chen et al. 2015), engage in tax avoidance (Chen et al. 2018), disclose non-GAAP earnings per share (EPS) numbers (Christensen et al. 2021), are more likely to switch to higher quality auditor (Fung et al. 2022),

and substitute away from equity and public debt toward bank debt (Li, Lin, and Zhan 2019). Moreover, Chen et al. (2015) finds that following a decrease in analyst coverage, firms are more likely to make value-destroying acquisitions, and CEOs are more likely to receive higher excess compensation.

In general, the prior research that examines the direct effect of analyst coverage on corporate governance and monitoring, finds that agency costs and information asymmetry increase after exogenous reductions in analyst coverage. Indeed, managers exploit the increased information asymmetry levels resulting from lost analyst coverage to facilitate their opportunistic activities. Subsequently, these opportunistic activities along with the increased levels of information asymmetry, could prompt auditors to revisit their assessment of audit risk for firms affected by broker exits and increase effort to compensate for the increased levels of information asymmetry.

### *2.2. Auditor Effort*

Audit fees are a function of effort and risk (Simunic 1980; DeFond and Zhang 2014). When auditors anticipate increased risks, they respond by increasing effort to mitigate the engagement risk, which result in higher audit fees (Bell, Landsman, and Shackelford 2001; Johnstone and Bedard 2004). Also, when pricing an audit engagement, auditors consider the information environment of the firm. Empirically, Dyck et al. (2010) documents that analysts are more likely to discover fraud than auditors, indicating that information asymmetry between managers and analysts may be lower than that between managers and auditors. Moreover, Gotti et al. (2012) provides strong evidence that audit fees are negatively related to the number of analysts covering a firm. However, the evidence in the study is limited since it only documents a

decrease in audit fees when firms attract more analyst coverage and does not provide any evidence on whether the reverse is true, that is, whether audit fees increase when firms lose coverage. Additionally, the changes in analyst coverage in their setting is inherently endogenous since they are not able to exploit a natural experiment setting where analyst coverage changes are exogenous.

The findings from studies that have utilized the natural experimental setting associated with these brokerage houses mergers and closures imply an increase in information asymmetry which would suggest that auditors are more likely to charge higher fees following exogenous decreases in analyst coverage. This argument is mostly consistent with auditor assurance role (Mansi et al. 2004). Under the auditor assurance role perspective, if the auditor perceives that the level of information asymmetry between the analyst and the client is lower than that between the auditor and the client, then a reduction in analyst coverage might affect auditors' ability to provide assurance over financial reporting, and therefore, the auditor may increase effort (i.e., charge higher audit fees) to substitute for lost analyst coverage. On the other hand, the auditor insurance role suggests that auditors can be sued in the event that investors rely on flawed financial reports, and therefore, provide some source of compensation for any damages suffered (Mansi et al. 2004). Given this perspective, since analysts are less likely to be sued or held liable in the event of an audit failure, audit fees might not significantly change as auditors' litigation risk remains constant under the insurance role of the auditor.

Even though one perspective suggests that audit fees remain unchanged after reductions in analyst coverage, prior studies provide strong evidence that firms agency costs and information asymmetry levels increase following a sudden decrease in analyst coverage (e.g., Chen et al. 2015; Irani and Oesch 2016; Li et al. 2019). Therefore, I expect audit fees to increase

as a result of increased levels of information asymmetry after broker exits. This leads to my first research hypothesis (in alternative form):

**H1**: *Ceteris paribus*, audit fees will increase following a decrease in analyst coverage.

Audit report lag serves as an additional proxy for auditor effort (Knechel and Payne 2001; Knechel et al. 2009). Moreover, audit report timeliness (i.e., audit report lag) is a function of accounting quality (Francis 2004), and the SEC passed a series of regulatory requirements that reduced the filing deadlines for many public companies (Securities and Exchange Commission 2002). Marshall, Schroeder, and Yohn (2019) argue that investors have less confidence in earnings announcements when audited financial statements are delayed. Knechel and Payne (2001) argue that the value of financial statements diminishes as the time between the end of the company's fiscal year and the release of its financial statements increases. In general, prior research findings suggest that decisions based on financial statement information may be affected by the timeliness of the release of the financial reports. Accordingly, I examine whether changes in analyst coverage negatively affect the timeliness of releasing audited financial statements. This leads to my second research hypothesis (in alternative form):

**H2:** *Ceteris paribus*, audit report lag will increase following a decrease in analyst coverage.

### *2.3. Financial Reporting Quality*

Prior studies suggest that as auditor effort increases, the likelihood of a future restatement decreases because the auditor is more likely to detect a material misstatement (Knechel et al. 2009). Empirically, Bedard and Johnstone (2004) report that auditors increase effort for clients

with higher perceived risk of earnings management, and Schelleman and Knechel (2010) find that auditors increase audit effort as a response to high levels of short-term accruals.

While prior literature documents that financial reporting quality deteriorates following a decrease in analyst coverage resulting from broker exits (e.g., Irani and Oesch 2016; Chen et al. 2015), their proxy for financial reporting quality utilizes an accruals-based measure for earnings management. In this study, I rely on the probability of future restatements as my proxy for firms financial reporting quality and examine whether firms are more likely to restate their financial statements following broker exits. A key advantage of using future restatements as a proxy for financial reporting quality is that it also captures actual audit quality and has relatively low measurement errors (DeFond and Zhang 2014).

Consistent with prior literature findings that show an overall decrease in firms' financial reporting quality following the exogenous reduction in analyst coverage (e.g., Irani and Oesch 2016; Chen et al. 2015), I expect firms' probability of future restatements to increase. This leads to my third research hypothesis (in alternative form):

**H3:** *Ceteris paribus*, the probability of a future restatement will increase following a decrease in analyst coverage.

## CHAPTER THREE:

## RESEARCH DESIGN

One of the major concerns of examining the effect of analyst coverage on audit outcome, is the fact that analyst coverage is likely endogenous. Prior studies have shown that analysts are more likely to cover firms with lower levels of information asymmetry (Lang and Lundholm 1996; Bushman et al. 2005), and the level of information asymmetry is likely correlated with individual firms' decisions and policies (Chen et al. 2015). Therefore, firms with fewer agency problems likely attract more analyst coverage. Moreover, analysts initiate and terminate coverage all the time and these decisions are likely correlated with unobservable individual firms' characteristics.

To alleviate the endogeneity problem, I rely on two sources of exogenous shocks to analyst coverage – brokerage mergers and closures – that provide a natural experimental setting where analysts decision to terminate coverage of firms is not correlated with firm-specific characteristics (Hong and Kacperczyk 2010; Kelly and Ljungqvist 2012). When brokerage houses merge, they tend to have some overlap in coverage before the merger and as a result, they dismiss some analysts covering the same stock (usually from the target house) to reduce redundancy and avoid culture clash (Wu and Zang 2009). I restrict my sample to firms that were covered by both brokerage houses before the merger and continued to be covered by the merged entity, to ensure that individual firm characteristics are not likely causing the merged entity to drop coverage regardless of redundancy (Hong and Kacperczyk 2010). The second source of

exogenous shock to analyst coverage is brokerage house closures. When brokers close, they dismiss all of their analysts, and all covered firms will immediately lose some analyst coverage, regardless of individual firm characteristics (Kelly and Ljungqvist 2012). Therefore, broker mergers and/or closures provide an ideal setting to examine the effect of exogenous variation in analyst coverage on audit outcome.

*3.1. Sample selection*

To identify firms that are affected by brokerage mergers or closures, I obtain lists of all brokerage mergers and closures between 2000 and 2008 from Hong and Kacperczyk (2010) and Kelly and Ljungqvist (2012). The list of broker mergers and closures can be found in Appendix A.

I use the I/B/E/S Broker Translation file to identify the I/B/E/S broker code for each broker.[2] I then manually match each broker name with its I/B/E/S code in the I/B/E/S Detail History file to obtain a list of firms affected by broker exits. I obtain the coverage stop date for each broker from Chen et al. (2018) and follow their design by treating the six months symmetrically around the coverage stop date as the event period (month – 3, event month, month +3) because brokerage mergers and closures may take several months to complete. Figure 1 is adapted from Chen et al. (2018) to illustrate the timeline. My final merger and closure list include 13 mergers and 22 closures spanning from 2000 to 2008.

Following prior studies (Hong and Kacperczyk 2010; Chen et al. 2015; Chen et al. 2018; Christensen et al. 2021; Li et al. 2019), I use a narrow two-year window to identify affected firms to increase the likelihood that I am only capturing the direct effects of the exogenous

[2] At the time of doing this research, the I/B/E/S Broker Translation file was no longer available in the I/B/E/S database. I thank professor Novia Chen for sharing her downloaded file with me.

changes in coverage. Another reason for restricting the window is that other new analysts can make up for the diminishing coverage by initiating coverage for the affected firms in subsequent years. For mergers, I require that both bidder and target cover at least one overlapping firm in the period before the event (months -15 to -3) and continue to cover that firm for at least one year following the merger (months +3 to +15), to ensure that covered firms are not dropped by the merged entity for endogenous reasons (Chen et al. 2015; Chen et al. 2018). For closures, I require affected firms to be covered by the closed broker in the period before the event (months -15 to -3) and remain in the I/B/E/S sample for at least one year following the closure date (months +3 to +15). Following Chen et al. (2018), for both mergers and closures, I search the I/B/E/S stop file and remove firms that lost coverage before the event date (before month – 3) to ensure that coverage termination is exogenous and was not anticipated by analysts beforehand. Finally, I merge my list of affected firms with COMPUSTAT and Audit Analytics and obtain the last fiscal year that ends three months before the event (t-1), and the first fiscal year that starts three months after the event (t+1). I keep firms that have both pre (t-1) and post (t+1) COMPUSTAT / Audit Analytics variables. Table 1 shows how the final sample is constructed which include 1,814 firm-year observations of which 907 are pre (t-1) and 907 are post (t+1).[3]

### *3.2. Estimation models and variables*

[3] Of the 907 firms, 814 are unique firms. I consider the entire 907 shocks even if some firms experienced more than one shock from 2000 to 2008 as long as these shocks happened in different years. The results are not sensitive to excluding firms with multiple shocks.

*3.2.1. Audit Fees*

To examine the effect of changes in analyst coverage on auditor effort, I follow prior studies (Simunic 1980; Palmrose 1986; Francis, Reichelt, and Wang 2005; Hay, Knechel, and Wong 2006; Blankley, Hurtt, and MacGregor 2012; Lobo and Zhao 2013) and estimate the following model where the dependent variable is *AUDIT_FEES* to capture auditor effort in Equation (1):

$$AUDIT\_FEES = \beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 LEVERAGE + \beta_4 RECINV + \beta_5 ROA + \beta_6 LOSS + \beta_7 FOREIGN + \beta_8 MERGER + \beta_9 RESTRUCTURE + \beta_{10} SPECIAL + \beta_{11} BUSY + \beta_{12} BIGN + \beta_{13} REST + \beta_{14} ACCL + \beta_{15} NON\_AUDIT + \beta_{16} GC + \beta_{17} SWITCH + \beta_{18} YYFE + \beta_{19} FF12 + \varepsilon \quad (1)$$

Where:

| | |
|---|---|
| *AUDIT_FEES* | = natural log of audit fees; |
| *SHOCK* | = 1 for the period after brokerage exit and 0 for the period before brokerage exit; |
| *SIZE* | = natural log of total assets; |
| *LEVERAGE* | = total liabilities divided by total assets; |
| *RECINV* | = account receivables + inventory scaled by total assets; |
| *ROA* | = net income divided by total assets; |
| *LOSS* | = 1 if firm incurred a loss, 0 otherwise; |
| *FOREIGN* | = 1 if firm has any foreign operations, and 0 otherwise; |
| *MERGER* | = 1 if firm reported merger related cost, 0 otherwise; |
| *RESTRUCTURE* | = 1 if firm reports restructure related cost, and 0 otherwise; |
| *SPECIAL* | = 1 if firm has a special item on income statement, and 0 otherwise; |
| *BUSY* | = 1 if a firm's fiscal year is December 31st, 0 otherwise; |
| *BIGN* | = 1 if firm is audited by Big N auditor, 0 otherwise; |
| *REST* | = 1 if firm financial statements are restated, 0 otherwise; |
| *ACCL* | = 1 if firm is an accelerated filer[4], 0 otherwise; |
| *NON_AUDIT* | = natural log of non-audit fees; |
| *GC* | = 1 if the auditor issues a going concern audit opinion, 0 otherwise; |
| *SWITCH* | = 1 if firm switches auditor in the post period, 0 otherwise; |
| *YYFE* | = control for years fixed effects; and |
| *FF12* | = control for industry fixed effects based on Fama-French 12 industry classification. |

[4] A firm is considered an accelerated filer by the SEC if the firm has a public float of $75 million or more (SEC 2020).

The coefficient of interest is *SHOCK* which capture the period following broker exits. If the auditor increases audit fees as a result of lost coverage, I expect the coefficient on *SHOCK* to be positive and significant. Following prior literature examining the factors affecting audit fees, I control for firm size (*SIZE*), the presence of mergers (*MERGER*) or foreign operations (*FOREIGN*), and the issuance of a going concern opinion (*GC*). I also control for audit risk by including (*ROA*), (*LOSS*), (*LEVERAGE*). Finally, I control for financial reporting quality and audit quality (*REST*), (*BIGN*) and whether a firm has a December fiscal year end (*BUSY*) (Simunic 1980; Palmrose 1986; Francis et al. 2005; Hay et al. 2006; Blankley et al. 2012; Lobo and Zhao 2013). To minimize the effect of outliers, all continuous variables are winsorized at the 10$^{th}$ and 90$^{th}$ percentile respectively[5].

To examine whether the effect of lost coverage is greater for firms with initial high levels of information asymmetry, I partition the sample into two groups based on the number of analysts following the firm prior to the change where I employ splits based on both tercile and median. Since the level of institutional holding is another proxy for information asymmetry levels, I also partition the sample into two groups based on the percentage of institutional ownership and use both tercile and median splits.

### *3.2.2. Audit Report Lag*

I also examine whether changes in analyst coverage affect audit report timeliness. Consistent with prior studies (Kneckel and Payne 2001; Abernathy, Guo, Kubick, and Masli 2019; Ashton, Graul, and Newton 1989; Kinney and McDaniel 1993; Schwartz and Soo 1996; Cullinan 2003; Ettredge, Li, and Sun 2006; Munsif, Raghunandan, and Rama 2012; Blankley,

[5] The results are qualitatively similar when winsorizing at the 1$^{st}$ and 99$^{th}$ percentile.

Hurtt, and MacGregor 2014), I use audit report lag as my proxy for audit report timeliness and estimate the following model in Equation (2):

$$ARL = \beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 LEVERAGE + \beta_4 RECINV + \beta_5 ROA + \beta_6 LOSS + \beta_7 FOREIGN + \beta_8 MERGER + \beta_9 RESTRUCTURE + \beta_{10} SPECIAL + \beta_{11} BUSY + \beta_{12} BIGN + \beta_{13} REST + \beta_{14} ACCL + \beta_{15} OCF + \beta_{16} EXTRA + \beta_{17} DISC + \beta_{18} FILE\_404 + \beta_{19} AUDIT\_FEES + \beta_{20} NON\_AUDIT + \beta_{21} GC + \beta_{22} G\_SEG + \beta_{23} B\_SEG + \beta_{24} SWITCH + \beta_{25} YYFE + \beta_{26} FF12 + \varepsilon \quad (2)$$

Where:

| | |
|---|---|
| *ARL* | = natural log of audit lag which is the number of days between the fiscal year-end and the date of the audit report; |
| *SHOCK* | = 1 for the period after brokerage exit and 0 for the period before brokerage exit; |
| *SIZE* | = natural log of total assets; |
| *LEVERAGE* | = total liabilities divided by total assets; |
| *RECINV* | = account receivables + inventory scaled by total assets; |
| *ROA* | = net income divided by total assets; |
| *LOSS* | = 1 if firm incurred a loss, 0 otherwise; |
| *FOREIGN* | = 1 if firm has any foreign operations, and 0 otherwise; |
| *MERGER* | = 1 if firm reported merger related cost, 0 otherwise; |
| *RESTRUCTURE* | = 1 if firm reports restructure related cost, and 0 otherwise; |
| *SPECIAL* | = 1 if firm has a special item on income statement, and 0 otherwise; |
| *BUSY* | = 1 if a firm's fiscal year is December 31st, 0 otherwise; |
| *BIGN* | = 1 if firm is audited by Big N auditor, 0 otherwise; |
| *REST* | = 1 if firm financial statements are restated, 0 otherwise; |
| *ACCL* | = 1 if firm is an accelerated filer, 0 otherwise; |
| *OCF* | = operating cash flow scaled by total assets; |
| *EXTRA* | = 1 if firm has extraordinary items, 0 otherwise; |
| *DISC* | = 1 if firm has discontinued operation, 0 otherwise; |
| *FILE_404* | = 1 if the firm has an auditor internal control report, 0 otherwise; |
| *AUDIT_FEES* | = natural log of audit fees; |
| *NON_AUDIT* | = natural log of non-audit fees; |
| *GC* | = 1 if the auditor issues a going concern audit opinion, 0 otherwise; |
| *G_SEG* | = the natural log of 1 plus the number of geographic segments; |
| *B_SEG* | = the natural log of 1 plus the number of business segments; |
| *SWITCH* | = 1 if firm switches auditor in the post period, 0 otherwise; |
| *YYFE* | = control for years fixed effects; and |
| *FF12* | = control for industry fixed effects based on Fama-French 12 industry classification. |

Similar to the previous model, the coefficient of interest is *SHOCK*. If changes in analyst coverage negatively affect audit report timeliness, then I expect *SHOCK* to be positive and

significant. Consistent with prior literature, I control for the firms' operations complexity by including firm's size (*SIZE*), the presence of mergers (*MERGER*) or foreign operations (*FOREIGN*), the number of business segments (*B_SEG*), and the number of geographical segments (*G_SEG*). I also control for auditor opinion (*GC*), audit fees (*AUDIT_FEES*), and non-audit fees (*NON_AUDIT*) to capture auditor effort. To account for firms' various risks, I include firms' return on assets (*ROA*) and leverage (*LEVERAGE*), operating cash flow (*OCF*), the incurrence of a loss (*LOSS*), whether a firm reported an extraordinary item (*EXTRA*), and whether a firm announced a discontinued operation (*DISC*). Finally, I control for firms' internal control quality and the external auditor by including auditor internal control report (*FILE_404*), whether the external auditor is a big4 (*BIGN*), whether the firm has a December fiscal year end (*BUSY*), and whether the firm is an accelerated filer (*ACCL*) (Knechel and Payne 2001; Abernathy et al. 2019; Ashton et al. 1989; Kinney and McDaniel 1993; Schwartz and Soo 1996; Cullinan 2003; Ettredge et al. 2006; Munsif et al. 2012; Blankley et al. 2014). Similar to the previous model, all continuous variables are winsorized at the 10$^{th}$ and 90$^{th}$ percentile[6] respectively. Also, to examine the cross-sectional effect of lost coverage on firms with initial high levels of information asymmetry, I partition the sample into two groups based on the number of analysts following (institutional ownership) where I employ both tercile and median splits.

### *3.2.3. Restatement*

[6] The results are qualitatively similar when winsorizing at the 1$^{st}$ and 99$^{th}$ percentile.

Finally, I examine whether changes in analyst coverage affect firms' financial reporting quality. While prior studies (e.g., Chen et al. 2015; Irani and Oesch 2016) already documented that firms are more likely to experience a deterioration in financial reporting quality following changes in analyst coverage, I use a different proxy to measure financial reporting quality by using the likelihood of a restatement (*REST*) as my dependent variable in a logit regression. I follow prior literature (Lennox 2016; Burns and Kedia 2006; Erickson, Hanlon, and Maydew 2006; Lennox and Pittman 2010; Lobo and Zhao 2013; Lennox and Li 2014) and estimate the following model in Equation (3):

$$\text{Logit } (REST = 1) = \beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 AUDIT\_FEES + \beta_4 LOSS + \beta_5 BIGN + \beta_6 US + \beta_7 GC + \beta_8 SWITCH + \beta_9 YYFE + \beta_{10} FF12 + \varepsilon^{7} \quad (3)$$

Where:

| | |
|---|---|
| *REST* | = 1 if firm financial statements are restated, 0 otherwise; |
| *SHOCK* | = 1 for the period after brokerage exit and 0 for the period before brokerage exit; |
| *SIZE* | = natural log of total assets; |
| *AUDIT_FEES* | = natural log of audit fees; |
| *LOSS* | = 1 if firm incurred a loss, 0 otherwise; |
| *BIGN* | = 1 if firm is audited by Big N auditor, 0 otherwise; |
| *US* | = 1 if firm headquarter is in the US, 0 otherwise; |
| *GC* | = 1 if the auditor issues a going concern audit opinion, 0 otherwise; |
| *SWITCH* | = 1 if firm switches auditor in the post period, 0 otherwise; |
| *YYFE* | = control for years fixed effects; and |
| *FF12* | = control for industry fixed effects based on Fama-French 12 industry classification. |

The *SHOCK* coefficient captures the probability that firms will be required to restate their financial statements. If affected firms are more likely to have their financial reporting quality deteriorate following changes in analyst coverage, then I expect affected firms to be more likely to restate their financial statements in the post period, resulting in a positive significant

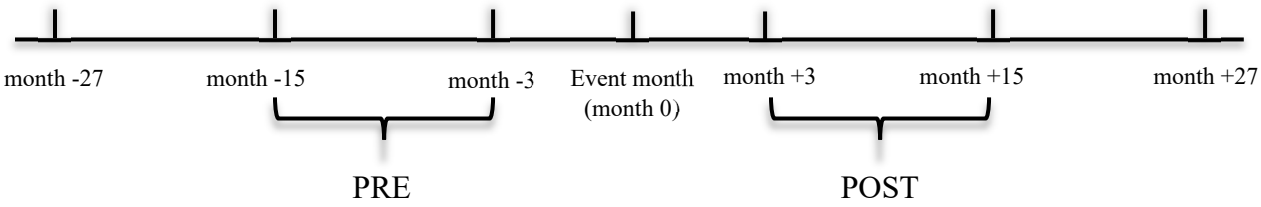
[7] This model is replicating Lennox (2016) parsimonious model for the probability of future restatement. Results are qualitatively similar when using a more specified model.

coefficient on *SHOCK*. Following prior literature on restatements (*REST*) model, I control for firm size (*SIZE*) and financial distress (*LOSS*). I also control for audit fees (*AUDIT_FEES*), auditor size (*BIGN*), auditor opinion (*GC*), and whether a firm switches auditor (*SWITCH*). Finally, I control for whether a firm is headquartered in the U.S. (*US*). (Lennox 2016; Burns and Kedia 2006; Erickson et al. 2006; Lennox and Pittman 2010; Lobo and Zhao 2013; Lennox and Li 2014). Similar to the previous models, all continuous variables are winsorized at the $10^{th}$ and $90^{th}$ percentile respectively. Also, to examine the cross-sectional effect of lost coverage on firms with initial high levels of information asymmetry, I partition the sample into two groups based on the number of analysts following (institutional ownership) using both tercile and median splits.

**Figure 1**

Figure 1 is adapted from Chen et al. (2018).

**Figure 1** Affected firms timeline




Pre-period fiscal year (t-1) ends between month -15 and month -3. Post-period fiscal year (t+1) begins between month +3 and month +15

**TABLE 1**

Sample selection

| | Firms |
|---|---|
| Firms that were covered by bidder and target houses before the merger and continued to be covered by the merged entity after the merger | 140 |
| Firms that were covered by analysts from the closed broker | 1,530 |
| | **1,670** |
| Total number of firms affected by both broker houses mergers and closures in the period (2000 – 2008) | 1,416 |
| Merge with COMPUSTAT | 1,228 |
| Merge with Audit Analytics | 907 |
| Retain firms that have both pre and post COMPUSTAT / Audit Analytics variables | |
| Final sample (1 pre and 1 post) t-1 and t+1 | **1,814 (= 907 x 2)** |

# CHAPTER FOUR:

# RESULTS

## *4.1. Descriptive statistics*

Table 2 provides descriptive statistics for firms affected by broker exits in the period prior to coverage drops (t-1). Panel A shows that while firms might lose(gain) a different number of analysts following the shock, on average, firms lose 1.2 analysts following a brokerage exit. While most of the firms affected by broker exits are large firms with an average of 12 analysts covering each firm, the range in firms' size (i.e., total assets) is quite wide, which emphasizes the importance of controlling for firm size in each regression and accounting for outliers.

Panel B shows that the audit process variables (i.e., dependent variables) are significantly different between the pre and post period. For example, audit fees, audit report lags, and the probability of future restatements all increase in the post period relative to the pre period. The univariate statistics suggests that exogenous reductions in analyst coverage have an effect on the audit process. On the other hand, the other control variables are not significantly different from each other in the post period, suggesting that there are no major changes in firms' characteristics from the pre to the post period.

## *4.2. Regression results*

Table 3 reports the results from estimation of the audit fees regression model. In panel A, column (1) reports results for the full sample. The coefficient on the *SHOCK* variable is positive and significant (p-value <0.01) consistent with firms losing analyst coverage due to exogenous broker exits pay higher audit fees in the post period, which provides support for H1. Specifically,

firms experience an average of 5.2% increase in audit fees following an exogenous reduction in analyst coverage, which is consistent with an average increase of $161 thousand in audit fees. Column (2) reports results for high coverage firms where firms are ranked in the top tercile for analyst coverage (Tercile 3) prior to coverage changes while column (3) reports results for low coverage firms (Tercile 1). I find that the effect is mainly driven by firms in the low pre-changes' analyst coverage (Tercile 1), which is consistent with my prediction that the cost of losing one analyst is greater(smaller) for firms with initial high(low) levels of information asymmetry. Firms in the lowest analyst coverage tercile (column 3) experience an average of 7.8% increase in audit fees which translate to a dollar amount of $109 thousand following an exogenous reduction in analyst coverage. In columns (4) and (5), I utilize another proxy for information asymmetry levels, and split firms into terciles based on institutional ownership percentages. The coefficient on the *SHOCK* variable is insignificant in column (4) and is marginally significant in column (5). These results suggest that the fee increase is primarily driven by those firms with relatively higher information asymmetry, which appears to be captured by number of analysts following.

In panel B, I partition the sample based on median analyst coverage and institutional holdings. The results are consistent with those reported in Panel A. Firms in the low coverage group (column 3) experience the highest significant increase in audit fees in the post period (6.3%) while firms in the high coverage group (column 2) do not experience a significant increase in audit fees following an exogenous reduction in analyst coverage. Additionally, firms in the low institutional ownership group (column 5) experience a significant increase in audit fees in the post period as well (5.8%). Collectively, the results from panels A and B indicate that average audit fees increase significantly in the post period, and the effect is being driven by these

firms with initial high levels of information asymmetry captured by both the smaller number of analysts covering the firm (column 3) and the smaller percentage of institutional ownership (column 5).

Overall, the results indicate that auditors value analysts as information intermediary and respond strongly to firms losing analyst coverage, especially for firms that have initially low levels of analyst coverage. In other words, when information asymmetry increases, auditors respond by increasing audit effort. The coefficients on the other control variables are as expected. Larger and more complex firms pay higher audit fees. The presence of foreign operations (*FOREIGN*) and restructure related costs (*RESTRUCTURE*) also result in higher audit fees. Interestingly, big-4 auditors (*BIGN*) charge higher fees in general, but the effect is only significant for firms with low levels of analyst coverage which is consistent with the fact that auditors increase effort when information asymmetry increases. Finally, firms paying higher non-audit fees (*NON_AUDIT*) and those with a December fiscal year end (*BUSY*) pay higher audit fees. These results are consistent with prior literature that auditors charge more in the busy audit season and firms paying higher non-audit fees are more likely paying higher audit fees as well.

Table 4 reports the results from the estimation of the audit report lag regression. For both panels A and B, the coefficient on *SHOCK* is insignificant in all five columns. Firms affected by exogenous changes in analyst coverage do not appear to experience any significant delays in filing the audit report, thus H2 is not supported. The combined results of audit report lag and audit fees models suggest that auditors respond to exogenous changes in analyst coverage by increasing effort without compromising the timing of filing the audit report.

The coefficients on *SIZE* and *RECINV* are negative and significant while the coefficient on *OCF* is positive and significant, suggesting that larger firms with greater resources need less time to file the audit report. The coefficient on *FILE_404* is also negative and significant across all columns indicating that the presence of auditor internal report helps firms file the audit report faster. Finally, the coefficient on restatements (*REST*) is positive and significant across all columns indicating that the presence of a restatement is positively associated with audit report delays.

Table 5 reports the results from the estimation of the restatements logistic regression. Column (1) shows that the coefficient on *SHOCK* is positive and significant (p-value <0.05) providing support for H3, which posits that firms financial reporting quality deteriorate following exogenous changes in analyst coverage. Column (2) reports results for high coverage firms and column (3) reports results for low coverage firm. Unlike the audit fees model, cross sectionally, while firms experience significant deterioration in financial reporting quality, as evidenced by the probability of future restatements, the number of analysts following a firm does appear to be significantly associated with the probability of future restatements in the post period. On the other hand, cross-sectionally, it is evident that the significant results are driven by firms with low levels of institutional ownership (column 5). The coefficient on the *SHOCK* variable is positive and significant (p-value <0.01) in column (5) for both panels A and B, which suggests that the probability of future restatements is primarily driven by firms with smaller institutional ownership. Overall, the results are consistent with prior research that utilizes an accruals-based measure to proxy for financial reporting quality and find that financial reporting quality deteriorates following exogenous changes in analyst coverage (Irani and Oesch 2016;

Chen et al. 2015). I extend their findings by showing that financial reporting quality deterioration following lost analyst coverage can also be captured by the probability of future restatements.

The coefficient on *AUDIT_FEES* is mostly insignificant which suggest that higher audit fees are not associated with the probability of a restatement. While it is more likely to expect that audit fees is strongly associated with the probability of future restatements, audit fees is endogenous and could reflect auditor risk adjustment (Johnstone and Bedard 2001, 2003).

### *4.3. Robustness checks*

#### *4.3.1. Falsification test*

The short two-year window around the event that occurred because of a natural experiment (i.e., broker exits) allows me to examine the direct effect of analyst coverage on firms' audit outcome, without running into endogeneity issues. One argument is that all firms lose(gain) analyst coverage all the time and this change will always be anticipated. While my research design is consistent with the prior literature argument that broker exits setting is entirely exogenous to firms' individual policies and choices (Chen et al. 2015), I also examine whether this loss in analyst coverage is, on average, consistent across all firms. I include affected firms along with all un-affected firms that have the required variables from I/B/E/S, COMPUSTAT, and Audit Analytics for the pre and post periods around the event date and estimate the following regression in Equation (4)

$$COVERAGE = \beta_0 + \beta_1 SHOCK + \beta_2 TREAT + \beta_3 SHOCK \text{ X } TREAT + \varepsilon \quad (4)$$

*COVERAGE* is defined as the total number of analysts following the firm. The *SHOCK* variable takes the value of 1 for the post period while the *TREAT* variable takes the value of 1 for affected firms. The coefficient of interest is the interaction between *SHOCK* and *TREAT*

(*SHOCK* X *TREAT*). A negative significant coefficient would mean that, relative to un-affected firms, affected firms significantly lose analyst coverage in the post period. Moreover, Chen et al. (2018) documents that the effect of lost coverage persists for around three years. To further validate the research design, I create a quasi-event date by pushing broker exits date three years forward (+3) and examine whether affected firms' coverage trends are still different from un-affected firms.

Table 6 reports coverage regression results for Equation (4). Column (1) shows that the coefficient on *SHOCK* X *TREAT* is negative and significant which lend a strong support for the sample identification strategy. Compared to un-affected firms, affected firms lose an average of 1.49 analysts in the post period. Further, Column (2) shows that the coefficient on *SHOCK* X *TREAT* is insignificant, which provides validation for the natural experimental setting. While analysts initiate and terminate coverage all the time, the effect is randomly distributed when I pick a date other than the event date, and the effect is only significant around event date.

*4.3.2. Difference-in-Differences*

Although the natural experiment setting alleviates the endogeneity issues, one could argue that the issue of omitted correlated variables will always be present. In Table 6, I validated the design and showed that in the entire sample, that includes both affected and un-affected firms, the parallel trend assumption is satisfied. Affected firms significantly lose analyst coverage in the post period when compared to un-affected firms. In Table 7, I estimate the three main regressions again after including all un-affected firms as control firms (Irani and Oesch 2016). I added two variables to the regressions. *TREAT* takes the value of 1 for affected firms and *SHOCK* X *TREAT* is the interaction between *SHOCK* and *TREAT* variables. It is the variable

of interest that captures the difference-in-differences (DiD) design. For brevity, I do not report the coefficients on the control variables, but they are included in the regressions. In Columns (1), (2), and (3), the coefficients on *SHOCK* X *TREAT* in all three regressions are consistent with my earlier results, indicating that results hold after including control firms in a DiD design.

**TABLE 2**

Sample consists of 1,814 firm year observations of which 907 are pre and 907 are post periods

**Panel A:** Descriptive statistics (pre period)

| | N | Mean | Standard deviation | Min | Median | Max |
|---|---|---|---|---|---|---|
| Analyst coverage: | | | | | | |
| Before brokerage exit | 907 | 12.408 | 7.812 | 1 | 11 | 48 |
| After brokerage exit | 907 | 11.164 | 7.727 | 1 | 10 | 37 |
| Firm characteristics: | | | | | | |
| *AUDIT_FEES* | 907 | 0.859 | 0.776 | 0 | 0.591 | 4.463 |
| *ARL* | 899 | 4.745 | 0.561 | 3.610 | 4.595 | 6.746 |
| *REST* | 907 | 0.098 | 0.297 | 0 | 0 | 1 |
| *SIZE* | 907 | 7.524 | 1.927 | 2.766 | 7.566 | 14.193 |
| *LEVERAGE* | 907 | 0.517 | 0.281 | 0.022 | 0.507 | 1.689 |
| *ROA* | 907 | -0.039 | 0.382 | -4.753 | 0.030 | 0.399 |
| *NET_INCOME* | 907 | 306 | 2,652 | -56,121 | 46 | 22,315 |
| *B_SEG* | 907 | 1.58 | 1 | 1 | 1 | 7 |
| *G_SEG* | 907 | 2.5 | 2 | 1 | 2 | 16 |

**Panel B:** difference in means between pre (t-1) and post (t+1) periods

| | N | Pre-period | Post-period | Difference | t-statistics |
|---|---|---|---|---|---|
| *Analyst Coverage* | 1,814 | 12.408 | 11.164 | -1.243 | -3.41*** |
| *AUDIT_FEES* | 1,814 | 0.808 | 1.027 | 0.168 | 4.55*** |
| *ARL* | 1,798 | 4.745 | 4.826 | 0.080 | 2.75*** |
| *REST* | 1,814 | 0.098 | 0.177 | 0.079 | 4.93*** |
| *SIZE* | 1,814 | 7.524 | 7.634 | 0.110 | 1.20 |
| *LEVERAGE* | 1,814 | 0.516 | 0.551 | 0.034 | 2.56** |
| *ROA* | 1,814 | -0.039 | -0.019 | 0.020 | 1.43 |
| *NET_INCOME* | 1,814 | 306 | 96 | -210 | -1.24 |
| *B_SEG* | 1,814 | 1.581 | 1.570 | -0.011 | -0.23 |
| *G_SEG* | 1,814 | 2.506 | 2.635 | 0.129 | 1.31 |

## TABLE 3

The effect of changes in analyst coverage on audit fees

Model : $AUDIT\_FEES = \beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 LEVERAGE + \beta_4 RECINV + \beta_5 ROA + \beta_6 LOSS + \beta_7 FOREIGN + \beta_8 MERGER + \beta_9 RESTRUCTURE + \beta_{10} SPECIAL + \beta_{11} BUSY + \beta_{12} BIGN + \beta_{13} REST + \beta_{14} ACCL + \beta_{15} NON\_AUDIT + \beta_{16} GC + \beta_{17} SWITCH + \beta_{18} YYFE + \beta_{19} FF12 + \varepsilon$

**Panel A:** Tercile split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) Tercile 3 Coverage | (3) Tercile 1 Coverage | (4) Tercile 3 Institutional | (5) Tercile 1 Institutional |
|---|---|---|---|---|---|
| *INTERCEPT* | -0.679*** | -0.779*** | -0.619*** | -0.478*** | -0.673*** |
| | (-10.08) | (-4.72) | (-5.85) | (-3.37) | (-6.42) |
| ***SHOCK*** | **0.051*** ** | **0.056*** | **0.075*** ** | **0.019** | **0.056*** |
| | **(2.78)** | **(1.71)** | **(2.65)** | **(0.63)** | **(1.72)** |
| *SIZE* | 0.147*** | 0.199*** | 0.133*** | 0.154*** | 0.140*** |
| | (22.14) | (14.00) | (10.64) | (12.05) | (13.43) |
| *LEVERAGE* | 0.266*** | 0.453*** | 0.182* | 0.458*** | 0.387*** |
| | (4.28) | (4.30) | (1.85) | (4.35) | (3.71) |
| *RECINV* | -0.059 | 0.004 | -0.047 | 0.173** | -0.160** |
| | (-1.38) | (0.05) | (-0.70) | (2.15) | (-2.10) |
| *ROA* | -0.173 | -0.133 | -0.017 | -0.475** | 0.076 |
| | (-1.34) | (-0.57) | (-0.08) | (-2.06) | (0.36) |
| *LOSS* | 0.002 | -0.093** | 0.104*** | -0.045 | 0.032 |
| | (0.09) | (-2.06) | (2.71) | (-1.05) | (0.77) |
| *FOREIGN* | 0.108*** | 0.156*** | 0.072*** | 0.130*** | 0.052** |
| | (6.94) | (5.76) | (2.73) | (4.95) | (1.97) |
| *MERGER* | 0.018 | -0.004 | -0.003 | -0.043 | 0.102** |
| | (0.72) | (-0.10) | (-0.06) | (-1.11) | (2.48) |
| *RESTRUCTURE* | 0.051*** | 0.054** | 0.031 | 0.032 | 0.111*** |
| | (3.32) | (2.22) | (1.16) | (1.23) | (4.18) |
| *SPECIAL* | 0.038 | -0.025 | 0.065 | -0.048 | 0.095 |
| | (0.80) | (-0.26) | (1.02) | (-0.58) | (1.23) |
| *BUSY* | 0.065*** | 0.070*** | 0.086*** | 0.058** | 0.066** |
| | (4.09) | (2.61) | (3.27) | (2.34) | (2.26) |

## TABLE 3 (Continued)

| | | | | | |
|---|---|---|---|---|---|
| *BIGN* | 0.132*** | -0.295*** | 0.137*** | -0.104* | 0.172*** |

| | | | | | |
|---|---|---|---|---|---|
| | (4.58) | (-2.91) | (3.53) | (-1.74) | (4.36) |
| *REST* | 0.029 | 0.016 | 0.026 | -0.016 | 0.042 |
| | (1.49) | (0.48) | (0.87) | (-0.47) | (1.27) |
| *ACCL* | 0.004 | -0.095* | 0.037 | -0.073 | -0.018 |
| | (0.17) | (-1.88) | (1.28) | (-1.24) | (-0.62) |
| *NON_AUDIT* | 0.476*** | 0.431*** | 0.415*** | 0.376*** | 0.511*** |
| | (17.49) | (9.71) | (7.73) | (8.25) | (11.36) |
| *GC* | 0.103 | 0.263 | 0.082 | -0.219 | 0.084 |
| | (1.34) | (1.36) | (1.50) | (-1.15) | (0.69) |
| *SWITCH* | -0.022 | -0.180** | -0.002 | -0.022 | 0.049 |
| | (-0.79) | (-3.23) | (-0.06) | (-0.40) | (1.22) |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,814 | 636 | 606 | 604 | 604 |
| $R^2$ | 0.73 | 0.74 | 0.68 | 0.72 | 0.78 |

**Panel B**: Median split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) High Coverage | (3) Low Coverage | (4) High Institutional | (5) Low Institutional |
|---|---|---|---|---|---|
| *INTERCEPT* | -0.679*** | -0.916*** | -0.572*** | -0.616*** | -0.655** |
| | (-10.08) | (-7.44) | (-6.69) | (-5.30) | (-7.67) |
| ***SHOCK*** | **0.051*** ** | **0.042** | **0.061*** ** | **0.026** | **0.056** ** |
| | **(2.78)** | **(1.57)** | **(2.60)** | **(0.99)** | **(2.25)** |
| *SIZE* | 0.147*** | 0.192*** | 0.141*** | 0.167*** | 0.143*** |
| | (22.14) | (18.01) | (14.75) | (16.15) | (16.67) |
| *LEVERAGE* | 0.266*** | 0.496*** | 0.125 | 0.349*** | 0.198** |
| | (4.28) | (5.58) | (1.57) | (3.94) | (2.38) |
| *RECINV* | -0.059 | 0.012 | -0.071 | 0.186*** | -0.083 |
| | (-1.38) | (0.20) | (-1.30) | (2.87) | (-1.38) |
| *ROA* | -0.173 | -0.218 | -0.085 | -0.396** | 0.0156 |
| | (-1.34) | (-1.17) | (-0.52) | (-2.03) | (0.10) |
| *LOSS* | 0.002 | -0.084** | 0.085*** | -0.023 | 0.017 |
| | (0.09) | (-2.35) | (2.70) | (-0.64) | (0.52) |

**TABLE 3 (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| *FOREIGN* | 0.108*** | 0.135*** | 0.077*** | 0.155*** | 0.067*** |

| | | | | | |
|---|---|---|---|---|---|
| | (6.94) | (6.33) | (3.63) | (7.10) | (3.10) |
| *MERGER* | 0.018 | 0.028 | -0.047 | -0.034 | 0.074** |
| | (0.72) | (0.87) | (-1.31) | (-1.00) | (2.18) |
| *RESTRUCTURE* | 0.051*** | 0.079*** | 0.036* | 0.0167 | 0.087*** |
| | (3.32) | (3.90) | (1.70) | (0.78) | (4.12) |
| *SPECIAL* | 0.038 | -0.014 | 0.052 | -0.062 | 0.103* |
| | (0.80) | (-0.20) | (0.88) | (-0.88) | (1.70) |
| *BUSY* | 0.065*** | 0.055** | 0.065*** | 0.079*** | 0.038* |
| | (4.09) | (2.46) | (3.09) | (3.73) | (1.65) |
| *BIGN* | 0.132*** | -0.059 | 0.134*** | -0.109** | 0.173*** |
| | (4.58) | (-0.93) | (4.30) | (-2.19) | (4.94) |
| *REST* | 0.029 | 0.024 | 0.018 | 0.006 | 0.044* |
| | (1.49) | (0.89) | (0.74) | (0.23) | (1.68) |
| *ACCL* | 0.004 | -0.063* | 0.039 | -0.026 | 0.007 |
| | (0.17) | (-1.70) | (1.56) | (-0.49) | (0.28) |
| *NON_AUDIT* | 0.476*** | 0.408*** | 0.436*** | 0.381*** | 0.518*** |
| | (17.49) | (11.69) | (10.52) | (9.96) | (13.85) |
| *GC* | 0.103 | 0.0313 | 0.119 | 0.098 | 0.142 |
| | (1.34) | (0.20) | (1.49) | (0.65) | (1.63) |
| *SWITCH* | -0.022 | -0.109** | 0.019 | -0.058 | 0.000 |
| | (-0.79) | (-2.41) | (0.58) | (-1.28) | (0.03) |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,814 | 946 | 868 | 822 | 992 |
| $R^2$ | 0.73 | 0.72 | 0.72 | 0.74 | 0.75 |

t-statistics are reported in parentheses. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).

## TABLE 4

The effect of changes in analyst coverage on audit report lag

Model : $ARL = \beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 LEVERAGE + \beta_4 RECINV + \beta_5 ROA + \beta_6 LOSS + \beta_7 FOREIGN + \beta_8 MERGER + \beta_9 RESTRUCTURE + \beta_{10} SPECIAL + \beta_{11} BUSY + \beta_{12} BIGN + \beta_{13} REST +$

$\beta_{14}\,ACCL + \beta_{15}\,OCF + \beta_{16}\,EXTRA + \beta_{17}\,DISC + \beta_{18}\,FILE\_404 + \beta_{19}\,AUDIT\_FEES + \beta_{20}\,NON\_AUDIT + \beta_{21}\,GC + \beta_{22}\,G\_SEG + \beta_{23}\,B\_SEG + \beta_{24}\,SWITCH + \beta_{25}\,YYFE + \beta_{26}\,FF12 + \varepsilon$

**Panel A:** Tercile split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) Tercile 3 Coverage | (3) Tercile 1 Coverage | (4) Tercile 3 Institutional | (5) Tercile 1 Institutional |
|---|---|---|---|---|---|
| *INTERCEPT* | 4.856*** | 4.917*** | 4.819*** | 5.109*** | 4.664*** |
| | (58.76) | (20.20) | (39.42) | (28.53) | (30.89) |
| ***SHOCK*** | **-0.014** | **-0.029** | **-0.019** | **-0.024** | **-0.063** |
| | **(-0.71)** | **(-0.68)** | **(-0.62)** | **(-0.69)** | **(-1.59)** |
| *SIZE* | -0.028*** | -0.019 | -0.018 | -0.028* | 0.002 |
| | (-3.44) | (-0.90) | (-1.26) | (-1.68) | (0.13) |
| *LEVERAGE* | 0.009 | 0.152 | -0.031 | -0.076 | 0.051 |
| | (0.14) | (1.05) | (-0.29) | (-0.61) | (0.37) |
| *RECINV* | -0.141*** | -0.243** | -0.193*** | -0.125 | -0.144 |
| | (-2.96) | (-2.29) | (-2.63) | (-1.31) | (-1.48) |
| *ROA* | 0.037 | 0.167 | 0.077 | 0.369 | -0.279 |
| | (0.23) | (0.46) | (0.30) | (1.17) | (-0.92) |
| *LOSS* | 0.066** | 0.065 | 0.073* | 0.074 | 0.064 |
| | (2.38) | (1.05) | (1.77) | (1.50) | (1.19) |
| *FOREIGN* | -0.015 | 0.020 | 0.011 | 0.022 | -0.034 |
| | (-0.81) | (0.51) | (0.38) | (0.63) | (-0.98) |
| *MERGER* | -0.004 | 0.059 | -0.073 | -0.024 | 0.039 |
| | (-0.17) | (1.19) | (-1.49) | (-0.54) | (0.74) |
| *RESTRUCTURE* | -0.016 | 0.004 | -0.023 | -0.005 | -0.068** |
| | (-0.97) | (0.13) | (-0.81) | (-0.15) | (-1.97) |
| *SPECIAL* | 0.029 | 0.033 | 0.096 | -0.115 | 0.264*** |
| | (0.56) | (0.13) | (1.42) | (-1.20) | (2.71) |
| *BUSY* | 0.012 | -0.039 | 0.079*** | 0.009 | 0.081** |
| | (0.67) | (-1.08) | (2.81) | (0.31) | (2.15) |
| *BIGN* | -0.004 | -0.025 | 0.052 | -0.125* | 0.002 |
| | (-0.14) | (-0.19) | (1.25) | (-1.82) | (0.04) |

**TABLE 4 (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| *REST* | 1.564*** | 1.611*** | 1.517*** | 1.551*** | 1.577*** |
| | (73.55) | (35.73) | (46.62) | (39.51) | (37.30) |

| | | | | | |
|---|---|---|---|---|---|
| *ACCL* | 0.029 | 0.033 | 0.013 | 0.027 | 0.043 |
| | (1.22) | (0.49) | (0.42) | (0.40) | (1.17) |
| *OCF* | 0.142** | -0.125 | 0.225*** | -0.185 | 0.277*** |
| | (2.09) | (-0.64) | (2.68) | (-1.09) | (2.77) |
| *EXTRA* | 0.032 | 0.046 | 0.053 | 0.116** | 0.020 |
| | (1.30) | (1.03) | (1.17) | (2.46) | (0.43) |
| *DISC* | 0.017 | 0.044 | 0.006 | -0.009 | 0.002 |
| | (0.82) | (1.05) | (0.17) | (-0.28) | (0.05) |
| *FILE_404* | -0.142*** | -0.260*** | -0.163*** | -0.199*** | -0.187*** |
| | (-4.96) | (-3.50) | (-4.19) | (-3.66) | (-3.57) |
| *AUDIT_FEES* | 0.027 | -0.009 | 0.055 | -0.023 | -0.035 |
| | (1.03) | (-0.17) | (1.23) | (-0.46) | (-0.66) |
| *NON_AUDIT* | -0.049 | -0.127 | -0.046 | -0.036 | 0.004 |
| | (-1.52) | (-1.95) | (-0.76) | (-0.63) | (0.07) |
| *GC* | 0.103 | 0.256 | -0.012 | 0.510** | 0.006 |
| | (1.23) | (1.00) | (-0.14) | (2.32) | (0.04) |
| *G_SEG* | 0.022 | 0.009 | 0.019 | 0.006 | 0.015 |
| | (1.59) | (0.34) | (0.88) | (0.24) | (0.56) |
| *B_SEG* | -0.014 | -0.001 | -0.042 | 0.041 | -0.029 |
| | (-0.79) | (-0.03) | (-1.36) | (1.31) | (-0.83) |
| *SWITCH* | 0.051* | 0.006 | 0.092** | 0.032 | -0.009 |
| | (1.70) | (0.08) | (2.24) | (0.50) | (-0.19) |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,798 | 628 | 602 | 598 | 600 |
| $R^2$ | 0.78 | 0.73 | 0.84 | 0.80 | 0.75 |

**TABLE 4 (Continued)**

**Panel B:** Median split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) High Coverage | (3) Low Coverage | (4) High Institutional | (5) Low Institutional |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| *INTERCEPT* | 4.856*** | 4.874*** | 4.867*** | 5.083*** | 4.771*** |
| | (58.76) | (28.87) | (47.98) | (36.33) | (42.68) |
| ***SHOCK*** | **-0.014** | **-0.022** | **-0.032** | **-0.007** | **-0.033** |
| | **(-0.71)** | **(-0.67)** | **(-1.23)** | **(-0.26)** | **(-1.16)** |
| *SIZE* | -0.028*** | -0.023 | -0.021* | -0.029** | -0.028** |
| | (-3.44) | (-1.54) | (-1.77) | (-2.20) | (-2.47) |
| *LEVERAGE* | 0.009 | 0.099 | -0.063 | -0.103 | 0.131 |
| | (0.14) | (0.90) | (-0.73) | (-1.03) | (1.36) |
| *RECINV* | -0.141*** | -0.127* | -0.162*** | -0.069 | -0.183*** |
| | (-2.96) | (-1.69) | (-2.66) | (-0.94) | (-2.63) |
| *ROA* | 0.037 | 0.143 | -0.011 | 0.268 | -0.047 |
| | (0.23) | (0.54) | (-0.05) | (1.06) | (-0.21) |
| *LOSS* | 0.066** | 0.084* | 0.034 | 0.060 | 0.073* |
| | (2.38) | (1.92) | (0.98) | (1.51) | (1.87) |
| *FOREIGN* | -0.015 | -0.003 | -0.030 | -0.000 | -0.034 |
| | (-0.81) | (-0.11) | (-1.25) | (-0.00) | (-1.32) |
| *MERGER* | -0.004 | 0.022 | -0.026 | -0.019 | 0.009 |
| | (-0.17) | (0.58) | (-0.66) | (-0.52) | (0.25) |
| *RESTRUCTURE* | -0.016 | -0.009 | -0.024 | -0.007 | -0.043* |
| | (-0.97) | (-0.40) | (-1.04) | (-0.29) | (-1.74) |
| *SPECIAL* | 0.029 | -0.036 | 0.087 | -0.087 | 0.081 |
| | (0.56) | (-0.44) | (1.38) | (-1.13) | (1.16) |
| *BUSY* | 0.012 | -0.026 | 0.044* | -0.030 | 0.060** |
| | (0.67) | (-0.96) | (1.93) | (-1.25) | (2.23) |
| *BIGN* | -0.004 | -0.111 | 0.029 | -0.055 | 0.004 |
| | (-0.14) | (-1.46) | (0.86) | (-0.99) | (0.10) |
| *REST* | 1.564*** | 1.612*** | 1.529*** | 1.565*** | 1.562*** |
| | (73.55) | (49.67) | (56.06) | (51.65) | (51.62) |
| *ACCL* | 0.029 | 0.057 | -0.002 | 0.006 | 0.021 |
| | (1.22) | (1.26) | (-0.09) | (0.11) | (0.74) |

**TABLE 4 (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| *OCF* | 0.142** | -0.051 | 0.188** | -0.190 | 0.211** |
| | (2.09) | (-0.38) | (2.50) | (-1.38) | (2.54) |
| *EXTRA* | 0.032 | 0.046 | 0.021 | 0.080** | -0.013 |

| | | | | | |
|---|---|---|---|---|---|
| | (1.30) | (1.39) | (0.56) | (2.27) | (-0.37) |
| *DISC* | 0.017 | 0.041 | -0.016 | 0.002 | 0.024 |
| | (0.82) | (1.37) | (-0.59) | (0.08) | (0.78) |
| *FILE_404* | -0.142*** | -0.139*** | -0.147*** | -0.159*** | -0.145*** |
| | (-4.96) | (-2.69) | (-4.43) | (-3.51) | (-3.73) |
| *AUDIT_FEES* | 0.027 | -0.017 | 0.072* | -0.005 | 0.053 |
| | (1.03) | (-0.41) | (1.89) | (-0.13) | (1.38) |
| *NON_AUDIT* | -0.049 | -0.091 | 0.022 | -0.038 | -0.066 |
| | (-1.52) | (-1.98) | (0.45) | (-0.83) | (-1.38) |
| *GC* | 0.103 | 0.431** | -0.003 | 0.287* | 0.035 |
| | (1.23) | (2.31) | (-0.03) | (1.73) | (0.35) |
| *G_SEG* | 0.022 | 0.028 | 0.025 | 0.007 | 0.037* |
| | (1.59) | (1.37) | (1.36) | (0.38) | (1.95) |
| *B_SEG* | -0.014 | -0.010 | -0.025 | -0.007 | -0.033 |
| | (-0.79) | (-0.43) | (-0.98) | (-0.33) | (-1.31) |
| *SWITCH* | 0.051* | 0.024 | 0.073** | 0.056 | 0.050 |
| | (1.70) | (0.45) | (2.14) | (1.11) | (1.29) |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,798 | 936 | 862 | 816 | 982 |
| $R^2$ | 0.78 | 0.76 | 0.83 | 0.81 | 0.78 |

t-statistics are reported in parentheses. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).

## TABLE 5

The effect of changes in analyst coverage on the probability of a future restatement

Model : Logit (*REST* = 1) = $\beta_0 + \beta_1 SHOCK + \beta_2 SIZE + \beta_3 AUDIT\_FEES + \beta_4 LOSS + \beta_5 BIGN + \beta_6 US + \beta_7 GC + \beta_8 SWITCH + \beta_9 YYFE + \beta_{10} FF12 + \varepsilon$

**Panel A:** Tercile split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) Tercile 3 Coverage | (3) Tercile 1 Coverage | (4) Tercile 3 Institutional | (5) Tercile 1 Institutional |
|---|---|---|---|---|---|
| *INTERCEPT* | -3.668*** | -3.897*** | -6.387*** | -2.809 | -3.016*** |
| | [<0.01] | [<0.01] | [<0.01] | [0.11] | [<0.01] |
| ***SHOCK*** | **0.355**** | **0.559*** | **0.046** | **0.063** | **1.018***** |
| | **[<0.05]** | **[0.06]** | **[0.88]** | **[0.84]** | **[<0.01]** |
| *SIZE* | -0.032 | 0.233 | -0.001 | -0.038 | -0.180 |
| | [0.68] | [0.22] | [0.99] | [0.80] | [0.19] |
| *AUDIT_FEES* | 0.404* | -0.096 | 0.410 | -0.336 | 0.856** |
| | [0.08] | [0.80] | [0.33] | [0.43] | [<0.05] |
| *LOSS* | 0.186 | -0.540 | 0.536* | 0.329 | -0.276 |
| | [0.28] | [0.14] | [0.07] | [0.27] | [0.38] |
| *BIGN* | -0.243 | - | -0.173 | -1.202** | 0.366 |
| | [0.42] | | [0.68] | [<0.05] | [0.46] |
| *US* | 0.523 | -0.721 | 1.766* | 0.467 | -0.238 |
| | [0.18] | [0.17] | [0.09] | [0.70] | [0.60] |
| *GC* | 0.647 | - | 0.796 | 2.048 | 0.529 |
| | [0.35] | | [0.31] | [0.16] | [0.66] |
| *SWITCH* | -0.046 | - | 0.206 | -0.392 | -0.137 |
| | [0.87] | | [0.62] | [0.52] | [0.76] |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,814 | 636 | 606 | 604 | 604 |
| *Frequency of REST* | 250 | 78 | 89 | 85 | 78 |
| $R^2$ | 0.09 | 0.08 | 0.13 | 0.15 | 0.11 |

**TABLE 5 (Continued)**

**Panel B:** Median split by analyst coverage (columns 2, 3) and institutional ownership (columns 4, 5)

| | (1) All | (2) High Coverage | (3) Low Coverage | (4) High Institutional | (5) Low Institutional |
|---|---|---|---|---|---|
| *INTERCEPT* | -3.668*** | -4.310*** | -5.505*** | -3.491** | -3.648*** |

| | | | | | |
|---|---|---|---|---|---|
| | [<0.01] | [<0.01] | [<0.01] | [<0.05] | [<0.01] |
| ***SHOCK*** | **0.355**** | **0.493*** | **0.262** | **-0.077** | **0.605***** |
| | **[<0.05]** | **[0.07]** | **[0.30]** | **[0.78]** | **[<0.01]** |
| *SIZE* | -0.032 | 0.109 | -0.024 | 0.090 | -0.051 |
| | [0.68] | [0.46] | [0.84] | [0.48] | [0.58] |
| *AUDIT_FEES* | 0.404* | 0.130 | 0.458 | -0.088 | 0.533* |
| | [0.08] | [0.69] | [0.20] | [0.80] | [0.08] |
| *LOSS* | 0.186 | -0.184 | 0.517** | 0.377 | 0.075 |
| | [0.28] | [0.49] | [<0.05] | [0.13] | [0.75] |
| *BIGN* | -0.243 | 0.433 | -0.387 | -1.00** | -0.039 |
| | [0.42] | [0.59] | [0.28] | [<0.05] | [0.92] |
| *US* | 0.523 | -0.148 | 2.101** | 0.650 | 0.475 |
| | [0.18] | [0.74] | [<0.05] | [0.85] | [0.26] |
| *GC* | 0.647 | -11.99 | 0.971 | 1.061 | 0.843 |
| | [0.35] | [0.99] | [0.22] | [0.41] | [0.30] |
| *SWITCH* | -0.046 | -0.338 | 0.071 | -0.467 | 0.295 |
| | [0.87] | [0.49] | [0.83] | [0.36] | [0.37] |
| *Year fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *Industry fixed effects* | Yes | Yes | Yes | Yes | Yes |
| *N* | 1,814 | 946 | 868 | 822 | 992 |
| *Frequency of REST* | 250 | 122 | 128 | 116 | 134 |
| $R^2$ | 0.09 | 0.08 | 0.13 | 0.11 | 0.09 |

p-values are reported in brackets. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).

## TABLE 6

Compare changes in analyst coverage between affected and unaffected firms

Model : $COVERAGE = \beta_0 + \beta_1 SHOCK + \beta_2 TREAT + \beta_3 SHOCK \times TREAT + \varepsilon$

| (1) Actual event-date | (2) Quasi event-date (+3 years) |
|---|---|

| | | |
|---|---|---|
| *INTERCEPT* | 5.268*** | 5.426*** |
| | (139.13) | (151.54) |
| *SHOCK* | 0.246*** | 0.495*** |
| | (4.60) | (9.77) |
| *TREAT* | 7.139*** | 6.112*** |
| | (41.75) | (30.39) |
| ***SHOCK* X *TREAT*** | **-1.489*** ** | **0.013** |
| | **(-6.16)** | **(0.05)** |
| *N* | 36,994 | 44,984 |
| $R^2$ | 0.07 | 0.04 |

t-statistics are reported in parentheses. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).

## TABLE 7

The effect of changes in analyst coverage on audit fees, audit report lag, and the probability of a restatement

Model (1) : $AUDIT\_FEES = \beta_0 + \beta_1 SHOCK + \beta_2 TREAT + \beta_3 SHOCK \text{ X } TREAT + CONTROLS + \varepsilon$
Model (2) *:* $ARL = \beta_0 + \beta_1 SHOCK + \beta_2 TREAT + \beta_3 SHOCK \text{ X } TREAT + CONTROLS + \varepsilon$

Model (3) : Logit (*REST* = 1) = $\beta_0 + \beta_1$ *SHOCK* + $\beta_2$ *TREAT* + $\beta_3$ *SHOCK* X *TREAT* + *CONTROLS* + $\varepsilon$

| | Pred. sign | (1) *AUDIT_FEES* | (2) *ARL* | (3) *REST* |
|---|---|---|---|---|
| *INTERCEPT* | | -0.525*** | 4.979*** | -2.871*** |
| | | (-46.03) | (310.18) | [<0.01] |
| *SHOCK* | | -0.003 | -0.026*** | 0.142*** |
| | | (-1.01) | (-6.71) | [<0.01] |
| *TREAT* | | -0.023*** | -0.026** | -0.178 |
| | | (-2.69) | (-2.39) | [0.13] |
| ***SHOCK* X *TREAT*** | + | **0.036*** ** | **-0.008** | **0.279*** |
| | | **(2.97)** | **(-0.54)** | **[0.06]** |
| *Controls* | | Yes | Yes | Yes |
| *Year fixed effects* | | Yes | Yes | Yes |
| *Industry fixed effects* | | Yes | Yes | Yes |
| *N* | | 36,994 | 36,488 | 36,994 |
| *Frequency of REST* | | - | - | 5,645 |
| $R^2$ | | 0.71 | 0.76 | 0.08 |

t-statistics are reported in parentheses. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).
p-values are reported in brackets. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively (two-tailed).

## CHAPTER FIVE:

## CONCLUSION

Exploiting two sources of exogenous shocks to analyst coverage, broker mergers and closures, I examine whether changes in analyst coverage affect the audit process. Specifically, I investigate whether changes in analyst coverage affect audit fees, audit report lag, and future restatements. I find that auditors respond to increased levels of information asymmetry by charging significantly higher audit fees following an exogenous reduction in analyst coverage. Further, I find that the effect is more pronounced for firms with smaller initial analyst coverage which is consistent with prior research findings that firms' information asymmetry levels increase following a reduction in analyst coverage. I also find no significant changes in audit report lag following a reduction in analyst coverage indicating that auditors respond to changes in information asymmetry levels by increasing effort (i.e., charge higher fees) without negative effects on audit report timeliness. Finally, consistent with the prior literature, I find that firms are more likely to have future restatements following a reduction in analyst coverage, consistent with a decrease in financial reporting quality following an exogenous decrease in analyst coverage.

The findings of this paper contribute to the literature in several ways. First, I extend the literature on the association between audit fees and corporate governance. I show that analyst monitoring affects auditor effort (i.e., audit fees). The results suggest that auditors perceive lower audit risk when financial analysts monitor the firm and respond by charging higher fees when analysts stop following the firm. Second, I empirically show that auditors consider analyst coverage as an important information intermediary whose presence improves the information environment of the firms they cover. Analysts reduce the level of information asymmetry, and the results indicate that auditors carefully consider the information environment of audited firms and respond promptly to sudden changes in information asymmetry levels. Finally, I contribute

to the growing body of literature that rely on natural experiments to establish causality and overcome endogeneity concerns (Hong and Kacperczyk 2010; Kelly and Ljungqvist 2012). Exploiting broker exits as an exogenous shock helps isolate the effect of information asymmetry on the audit process. This paper contributes to the literature by examining the role of analyst as external monitors and how their presence affect the audit process.

## REFERENCES

Abbott, L. J., Parker, S., Peters, G. F., & Raghunandan, K. (2003). The association between audit committee characteristics and audit fees. *Auditing: A Journal of Practice & Theory*, *22*(2), 17-32.

Abernathy, J. L., Guo, F., Kubick, T. R., & Masli, A. (2019). Financial statement footnote readability and corporate audit outcomes. *Auditing: A Journal of Practice & Theory*, *38*(2), 1-26.

Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics*, *42*(1-2), 203-243.

Ashton, R. H., Graul, P. R., & Newton, J. D. (1989). Audit delay and the timeliness of corporate reporting. *Contemporary Accounting Research*, *5*(2), 657-673.

Asquith, P., Mikhail, M. B., & Au, A. S. (2005). Information content of equity analyst reports. *Journal of Financial Economics*, *75*(2), 245-282.

Balakrishnan, K., Billings, M. B., Kelly, B., & Ljungqvist, A. (2014). Shaping liquidity: On the causal effects of voluntary disclosure. *The Journal of Finance*, *69*(5), 2237-2278.

Bedard, J. C., & Johnstone, K. M. (2004). Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions. *The Accounting Review*, *79*(2), 277-304.

Bell, T. B., Landsman, W. R., & Shackelford, D. A. (2001). Auditors' perceived business risk and audit fees: Analysis and evidence. *Journal of Accounting Research*, *39*(1), 35-43.

Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics*, *50*(2-3), 296-343.

Blankley, A. I., Hurtt, D. N., & MacGregor, J. E. (2012). Abnormal audit fees and restatements. *Auditing: A Journal of Practice & Theory*, *31*(1), 79-96.

Blankley, A. I., Hurtt, D. N., & MacGregor, J. E. (2014). The relationship between audit report lags and future restatements. *Auditing: A Journal of Practice & Theory*, *33*(2), 27-57.

Burns, N., & Kedia, S. (2006). The impact of performance-based compensation on misreporting. *Journal of Financial Economics*, *79*(1), 35-67.

Bushman, R. M., Piotroski, J. D., & Smith, A. J. (2005). Insider trading restrictions and analysts' incentives to follow firms. *The Journal of Finance*, *60*(1), 35-66.

Carcello, J. V., Hermanson, D. R., Neal, T. L., & Riley Jr, R. A. (2002). Board characteristics and audit fees. *Contemporary Accounting Research*, *19*(3), 365-384.

Securities and Exchange Commission. (2002, November 15). *Acceleration of Periodic Report Filing Dates and Disclosure Concerning Website Access to Reports*. Final rule: Acceleration of periodic report filing dates and disclosure concerning website access to reports. Retrieved May 16, 2022, from https://www.sec.gov/rules/final/33-8128.htm

Securities and Exchange Commission. (2020, April 23). *Accelerated Filer and Large Accelerated Filer Definitions*. Retrieved May 16, 2022, from https://www.sec.gov/corpfin/secg-accelerated-filer-and-large-accelerated-filer-definitions

Chen, N. X., Chiu, P. C., & Shevlin, T. (2018). Do analysts matter for corporate tax planning? Evidence from a natural experiment. *Contemporary Accounting Research*, *35*(2), 794-829.

Chen, T., Harford, J., & Lin, C. (2015). Do analysts matter for governance? Evidence from natural experiments. *Journal of Financial Economics*, *115*(2), 383-410.

Christensen, T. E., Gomez, E., Ma, M., & Pan, J. (2021). Analysts' role in shaping non-GAAP reporting: evidence from a natural experiment. *Review of Accounting Studies*, *26*(1), 172-217.

Cullinan, C. P. (2003). Competing size theories and audit lag: evidence from mutual fund audits. *Journal of the American Academy of Business, Cambridge*.

Das, S., Levine, C. B., & Sivaramakrishnan, K. (1998). Earnings predictability and bias in analysts' earnings forecasts. *The Accounting Review*, 277-294.

DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics*, *58*(2-3), 275-326.

Derrien, F., & Kecskés, A. (2013). The real effects of financial shocks: Evidence from exogenous changes in analyst coverage. *The Journal of Finance*, *68*(4), 1407-1440.

Dyck, A., Morse, A., & Zingales, L. (2010). Who blows the whistle on corporate fraud? *The Journal of Finance*, *65*(6), 2213-2253.

Erickson, M., Hanlon, M., & Maydew, E. L. (2006). Is there a link between executive equity incentives and accounting fraud? *Journal of Accounting Research*, *44*(1), 113-143.

Ettredge, M. L., Li, C., & Sun, L. (2006). The impact of SOX Section 404 internal control quality assessment on audit delay in the SOX era. *Auditing: A Journal of Practice & Theory*, *25*(2), 1-23.

Francis, J. R. (2004). What do we know about audit quality? *The British Accounting Review*, 36(4), 345-368.

Francis, J. R., Reichelt, K., & Wang, D. (2005). The pricing of national and city-specific reputations for industry expertise in the US audit market. *The Accounting Review*, *80*(1), 113-136.

Francis, J., & Soffer, L. (1997). The relative informativeness of analysts' stock recommendations and earnings forecast revisions. *Journal of Accounting Research*, *35*(2), 193-211.

Francis, J., Hanna, J. D., & Philbrick, D. R. (1997). Management communications with securities analysts. *Journal of Accounting and Economics*, *24*(3), 363-394.

Fung, S. Y. K., Wang, Z., Zhang, L., & Zhu, X. (2022). Exogenous Loss of Analyst Coverage and Choice of Audit Quality. *Accounting Horizons*.

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics*, *118*(1), 107-156.

Gotti, G., Han, S., Higgs, J. L., & Kang, T. (2012). Managerial stock ownership, analyst coverage, and audit fee. *Journal of Accounting, Auditing & Finance*, *27*(3), 412-437.

Gu, Z., & Wu, J. S. (2003). Earnings skewness and analyst forecast bias. *Journal of Accounting and Economics*, *35*(1), 5-29.

Hay, D. C., Knechel, W. R., & Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research*, *23*(1), 141-191.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1-3), 405-440.

Hong, H., & Kacperczyk, M. (2010). Competition and bias. *The Quarterly Journal of Economics*, *125*(4), 1683-1725.

Huang, A. H., Zang, A. Y., & Zheng, R. (2014). Evidence on the information content of text in analyst reports. *The Accounting Review*, *89*(6), 2151-2180.

Irani, R. M., & Oesch, D. (2016). Analyst coverage and real earnings management: Quasi-experimental evidence. *Journal of Financial and Quantitative Analysis*, *51*(2), 589-627.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360.

Johnstone, K. M., & Bedard, J. C. (2001). Engagement planning, bid pricing, and client response in the market for initial attest engagements. *The Accounting Review*, *76*(2), 199-220.

Johnstone, K. M., & Bedard, J. C. (2003). Risk management in client acceptance decisions. *The Accounting Review*, *78*(4), 1003-1025.

Ke, B., & Yu, Y. (2006). The effect of issuing biased earnings forecasts on analysts' access to management and survival. *Journal of Accounting Research*, *44*(5), 965-999.

Kelly, B., & Ljungqvist, A. (2012). Testing asymmetric-information asset pricing models. *The Review of Financial Studies*, *25*(5), 1366-1413.

Kim, J. B., Lu, L. Y., & Yu, Y. (2019). Analyst coverage and expected crash risk: Evidence from exogenous changes in analyst coverage. *The Accounting Review*, *94*(4), 345-364.

Kinney Jr, W. R., & McDaniel, L. S. (1993). Audit delay for firms correcting quarterly earnings. *Auditing: A Journal of Practice & Theory*, *12*(2), 135.

Knechel, W. R., & Payne, J. L. (2001). Additional evidence on audit report lag. *Auditing: A Journal of Practice & Theory*, *20*(1), 137-146.

Knechel, W. R., Rouse, P., & Schelleman, C. (2009). A modified audit production framework: Evaluating the relative efficiency of audit engagements. *The Accounting Review*, *84*(5), 1607-1638.

LaFond, R., & Roychowdhury, S. (2008). Managerial ownership and accounting conservatism. *Journal of Accounting Research*, *46*(1), 101-135.

Lang, M. H., & Lundholm, R. J. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review*, 467-492.

Lang, M. H., Lins, K. V., & Miller, D. P. (2004). Concentrated control, analyst following, and valuation: do analysts matter most when investors are protected least? *Journal of Accounting Research*, *42*(3), 589-623.

Lennox, C. S. (2016). Did the PCAOB's restrictions on auditors' tax services improve audit quality? *The Accounting Review*, *91*(5), 1493-1512.

Lennox, C., & Li, B. (2014). Accounting misstatements following lawsuits against auditors. *Journal of Accounting and Economics*, *57*(1), 58-75.

Lennox, C., & Pittman, J. (2010). Auditing the auditors: Evidence on the recent reforms to the external monitoring of audit firms. *Journal of Accounting and Economics*, *49*(1-2), 84-103.

Li, X., Lin, C., & Zhan, X. (2019). Does change in the information environment affect financing choices? *Management Science*, *65*(12), 5676-5696.

Lobo, G. J., & Zhao, Y. (2013). Relation between audit effort and financial report misstatements: Evidence from quarterly and annual restatements. *The Accounting Review*, *88*(4), 1385-1412.

Mansi, S. A., Maxwell, W. F., & Miller, D. P. (2004). Does auditor quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research*, *42*(4), 755-793.

Marshall, N. T., Schroeder, J. H., & Yohn, T. L. (2019). An incomplete audit at the earnings announcement: Implications for financial reporting quality and the market's response to earnings. *Contemporary Accounting Research*, *36*(4), 2035-2068.

Munsif, V., Raghunandan, K., & Rama, D. V. (2012). Internal control reporting and audit report lags: Further evidence. *Auditing: A Journal of Practice & Theory*, *31*(3), 203-218.

Palmrose, Z. V. (1986). Audit fees and auditor size: Further evidence. *Journal of Accounting Research*, 97-110.

Schelleman, C., & Knechel, W. R. (2010). Short-term accruals and the pricing and production of audit services. *Auditing: A Journal of Practice & Theory*, *29*(1), 221-250.

Schwartz, K. B., & Soo, B. S. (1996). The association between auditor changes and reporting lags. *Contemporary Accounting Research*, *13*(1), 353-370.

Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, 161-190.

Watts, R., & Zimmerman, J. (1981). The markets for independence and independent auditors.

Willenborg, M. (1999). Empirical analysis of the economic demand for auditing in the initial public offerings market. *Journal of Accounting Research*, *37*(1), 225-238.

Wu, J. S., & Zang, A. Y. (2009). What determine financial analysts' career outcomes during mergers? *Journal of Accounting and Economics*, *47*(1-2), 59-86.

Yu, F. F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics*, *88*(2), 245-271.

# APPENDICES

## APPENDIX A

List of broker mergers and closures

*Merger list*

| Event Date | Target House | Bidder House |
|---|---|---|
| May – 2000 | Wit Capital, Ltd. | SoundView Technology |
| October – 2000 | Donaldson Lufkin & Jenrette | CSFB |
| January – 2001 | Chase Manhattan | JP Morgan |
| February – 2001 | Wasserstein Perella & Co. | Dresdner Kleinwort. |
| April – 2001 | ING Financial Markets | ABN Amro |
| June – 2001 | Epoch Partners, Inc. | Goldman Sachs |
| July – 2001 | Josephthal Lyon & Ross | Fahnestock & Co. |
| August – 2001 | SunTrust Equitable Securities | Robinson-Humphrey—subsidiary of Smith Barney |
| October – 2001 | Tucker Anthony Sutro Capital Markets | RBC Dain Rauscher or Dain Rauscher Wessels |
| June – 2005 | Parker/Hunter, Inc. | Janney Montgomery Scott LLC |
| January – 2007 | Ryan Beck & Co. | Stifel Financial |
| September – 2007 | Cochran, Caronia Securities, LLC | Fox-Pitt Kelton |
| January – 2008 | CIBC World Markets | Oppenheimer |

*Closure list*

| Event Date | Closed broker |
|---|---|
| June – 2000 | Brown Brothers Harriman & Co. |
| June – 2000 | J. C. Bradford & Co. |
| October – 2000 | George K. Baum & Co. |
| July – 2001 | Emerald Research |
| July – 2001 | Conning& Co. |
| October – 2001 | Hoak, Breedlove, Wesneski, & Co. |
| March – 2002 | ABNAMRO |
| July – 2002 | Frost Securities, Inc. |
| July – 2002 | Robertson Stephens |
| August – 2002 | Vestigo-Fidelity Capital Markets |
| April – 2003 | Commerce Capital Markets, Inc. |
| July – 2003 | The Chapman Company |

| | |
|---|---|
| February – 2004 | Montauk Capital Markets Group |
| October – 2004 | Schwab Soundview Capital Markets |
| March – 2005 | J. B. Hanauer & Co. |
| May – 2005 | Tradition Asiel Securities, Inc. |
| June – 2005 | IRG Research |
| August – 2005 | Wells Fargo Securities |
| March – 2006 | Moors& Cabot, Inc. |
| April – 2007 | Cohen Bros. & Co. |
| June – 2007 | Prudential Equity Group, Inc. |
| November – 2007 | Nollenberger Capital Partners |