

THREE ESSAYS ON CONTAGION AND NETWORK ISSUES

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ABSTRACT OF THE DISSERTATION

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This dissertation consists of three essays that examine contagion and network-related issues. In the first essay, we document that the contagion effect of earnings management is much broader than documented by Chiu, et al (2013). We find that firms are exposed to the spillover effect of earnings management by contagious firms when directors on their corporate boards also serve as directors on corporate boards of other firms at the same time and even when the contagious firms do not restate their reported earnings. These findings thus confirm that earnings management behavior, measured by absolute discretionary accruals, spills over from contagious firms to other firms with common corporate board directors. The contagion effect is stronger as the number of interlinked directors between contagious and affected firms increases, and it is especially stronger when interlinked directors have accounting expertise. We, however, do not find a stronger contagion effect of directors with finance expertise or any other non-accounting expertise. Furthermore, we do not find any significant difference in the contagion effect when institutional shareholdings in the Affected firms are significant or interlinked directors are independent or executive.

The second essay examines the contagion effect of SEC comment letters through auditor offices. Using 7,451 initial comment letters for 10-K filings during the years 2005-2015, we discover that firms are more likely to receive comment letters after the SEC discovered a material deficiency in clarity or explanation in the 10-K filings of their industry peers audited by the same auditor office. Such contagion effect is only observable in auditor office whose clients receive accounting-related comment letters, and is attenuated by auditor office size. We also find that auditor offices develop expertise in resolving comment letters. Particularly, their client firms experience lower remediation costs (i.e., fewer topics in comment letters and fewer rounds of conversations) of addressing 10-K comment letters in the subsequent years. Overall, findings in this paper suggest that auditor offices are an important channel from which the SEC identifies firms in the comment letter review process.

In the third essay, we collect data on the career paths of accountants who work at the SEC to examine the effect of revolving doors on their effort while at the SEC. We examine outbound accountants, that is accountants who leave the SEC for jobs at big four accounting firms. We also examine inbound accountants that are hired by the SEC from the big four accounting firms. We find no systematic evidence that the regulatory effort (as captured by the severity of the comment letters they issue) of outbound and inbound accountant is different from others. The exceptions are 1) outbound accountants that join big 4 firms issue less severe comment letters to clients of their prospective employer in the last year of service at the SEC and 2) inbound accountants that are hired from the big four accounting firms issue less severe comment letters to clients of their prior employer in the

first year of their service at the SEC. The evidence points to some detrimental effect of revolving doors for accountants.

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TABLE OF CONTENTS

ABSTRACT OF THE DISSERTATION	ii
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
ESSAY 1: Contagion Effect of Earnings Management and Interlink among Board Directors across Firms: The Role of Accounting Expertise	1
1. Introduction.....	1
2. Literature review and hypotheses development.....	7
2.1 Corporate Directors' Network	7
2.2 Earnings Management Behavior and Corporate Boards.....	8
2.3 Hypotheses	10
3. Sample Selection and Research Design.....	16
3.1 Sample Selection.....	17
3.2 Identification of Common Directors between Contagious and Affected Firms	18
3.3 Calculation of Discretionary Accruals.....	19
3.4 Regression Model	19
4. Empirical results	21
4.1 Summary Statistics and Correlations	21
4.2 Regression Results	22
4.3 Sensitivity Test for H1	27
4.4 Robustness Tests.....	27
4.5 Endogeneity Concern.....	29
5. Conclusion	30
ESSAY 2: Contagion Effect of SEC Comment Letters on Firms with Interconnected Auditor Office.....	49

1. Introduction.....	49
2. Background and Hypotheses Development	53
2.1 SEC’s 10-K Review Process.....	53
2.2 The Determinants and Consequences of Comment Letter	54
2.3 The Contagion Effect of Low-Quality Audits	55
2.4 Hypotheses Development	56
3. Sample, Research Design and Descriptive Statistics	60
3.1 Sample.....	60
3.2 Research Design.....	61
3.3 Descriptive Statistics.....	64
4. Results Analysis.....	65
4.1 The Contagion Effect of Comment Letters in Auditor Office	65
4.2 Contagion Effect for Larger versus Smaller Offices	67
4.3 The Effect of Auditor Office’s Experience.....	67
4.4 Robustness Test	69
5. Conclusion	70
ESSAY 3: Revolving Doors for SEC Accountants	83
1. Introduction.....	83
2. Related literature and hypotheses	87
2.1 Literature review	87
2.2 SEC comment letter process	88
3. Data and research design	89
3.1 Data collection process	89
3.2 Data Description	91
3.3 Measuring the severity of comment letters	92
4. Outbound Accountants.....	95
4.1 Multivariate Analysis for Outbound Accountants	96
4.2 Outbound Accountants that join Big 4 Accounting Firms.....	98
5. Inbound revolvers	101

6. Conclusion	102
BIBLIOGRAPHY.....	116
APPENDICES	126
Appendix A: Variable Definitions for ESSAY 1.....	126
Appendix B: Titles of corporate offices held by directors that signify accounting and finance expertise and titles of senior executive officers	130
Appendix C: Variable Definitions for ESSAY 2.....	131
Appendix D: An example of the 10-K comment letter issued by SEC	134
Appendix E: Example of the data collection process	137
Appendix F: Variable Definitions for ESSAY 3	142

LIST OF TABLES

Table 1.1 Sample Selection.....	34
Table 1.2 Descriptive Statistics.....	34
Table 1.3 Effect of Common Directors on Corporate Boards of Aggressive EM Firms and Affected Firms on Earnings Management by Affected Firms.....	38
Table 1.4 The Effect of Accounting and Finance Expertise on the Contagion Effect of Earnings Management	40
Table 1.5 The Effect of High Institutional Shareholdings on the Contagion Effect of Earnings Management	42
Table 1.6 Robustness Tests for Earnings Management Incentives.....	44
Table 1.7 Robustness Test based on Alternative Proxy for Earnings Management	46
Table 1.8 Endogeneity Issue with the Effect of Common Directors on Spillover Effect of Earnings Management	47
Table 2.1 Sample Selection.....	72
Table 2.2 Descriptive Statistics.....	72
Table 2.3 Effect of Auditor Office with SEC 10-K Comment Letter Recipients	75
Table 2.4 Joint Effects of Auditor Office Size and Auditor Office with 10-K Comment Letter Recipients	79
Table 2.5 The Cost of Remediation Estimation Results for Model (2) and (3).....	80
Table 3.1 Sample refinement	104
Table 3.2 Description of SEC Accountant Data	104
Table 3.3 Description of Comment Letters.....	105
Table 3.4 Univariate Tests for Outbound Revolvers	107
Table 3.5 Analysis of outbound revolvers	108
Table 3.6 Analysis of Outbound Accountants to Big Four Firms	110
Table 3.7 Cross Sectional Analysis of Outbound Accountants to Big 4 Accounting Firms	111
Table 3.8 Inbound Accountants	112
Table 3.9 Cross sectional Analysis of Inbound Accountants	113

LIST OF FIGURES

Figure 1.1 Firm Networks in Year 2000, 2007, and 2015	33
Figure 1.2 The Trend of Board Size, Percentage of Accounting.....	33

ESSAY 1: Contagion Effect of Earnings Management and Interlink among Board Directors across Firms: The Role of Accounting Expertise

1. Introduction

Lately a trend of interlinking of corporate directors has been observed in firms across countries, especially in the US firms. Some directors are being appointed on more than one corporate boards simultaneously and this has resulted in interlinking of directors across firms in different countries. This trend has especially gained strength after passage of the Sarbanes-Oxley Act 2002 in the USA because of its requirement that at least one director should have financial expertise. This requirement has generated a strong demand for directors with financial and accounting expertise, which has generated manifold increase in the appointment of directors on several boards. This manifold increase in interlinking of corporate directors in recent years is depicted in Figure 1.1.

[Insert Figure 1.1 here]

The phenomenon of interlinking of corporate directors or common directors on the corporate boards of two or more firms, which is also known as network of directors across firms, raises an interesting question. Is this phenomenon good for firms or will it result in problems that will be of greater concern to investors and regulators? It is well established in the literature that social and economic networks serve as channels for information flow and at the same time these networks are expected to have a significant influence on individuals' behavior and on their decisions (Rogers 2003, Jackson 2008). Given this evidence in the social and economic literature, Chiu et al. (2013) examined whether the network of directors on corporate boards would also affect managerial behavior of earnings

management, especially when one of the interlocked firm aggressively manages the reported earnings and restates the financial statements. Their findings document the contagion effect of earnings management when one of the interlinked firm restates its financial statements. They interpret their findings to suggest that managerial behavior of earnings manipulations by firms that result in restating their annual financial statements impacts earnings management behavior of other firms whose directors are interconnected through their appointment on the corporate boards of both firms. Their findings thus confirm that there is a spill-over or contagion effect of earnings management, which may reduce the quality of reported earnings of the affected firms. Their evidence is, however, limited to the firms that restate their reported earnings in the financial statements. It would be of interest to investors to know whether the contagion effect is restricted to the firms that restate their reported earnings or it has wider application, meaning that the contagion effect of earnings management, especially aggressive earnings management, will spread to other firms with interconnected directors even when the contagion firm does not restate its reported earnings.

We argue in this study that the spillover effect of earnings management is especially contagious when firms engage in aggressive management and it is likely to spread to other firms that have interlinked directors. As discussed in the theoretical research on social network, human behavior can spread across firms through a series of mechanisms, especially through a network (Bikhchandani, David et al. 1992). This evidence suggests that the network of directors across different firms is likely to influence managerial behavior of interconnected firms. We, therefore, conjecture that aggressive earnings management in a firm will create the contagion effect on other firms when directors of the

contagious firm are also directors of other firms.

Additionally, we argue that this contagion effect is expected to be stronger as the number of common directors among the corporate boards of contagious and affected firms increases. Moreover, we conjecture that the contagion effect will also become stronger when interconnected directors have accounting expertise. We, however, do not expect the contagion effect to be stronger when interconnected directors have finance or other non-accounting expertise. Our expectation of stronger contagion effect for firms with accounting expertise is based on the argument that directors with accounting expertise will be a better conduit for the spillover effect because they have better understanding of accrual accounting and its weaknesses.

We also examine whether a higher percentage of institutional shareholdings, which is found to have a significant influence on managerial decision making (Cornett, Marcus et al. 2007, Huang, Paul 2016, Grinstein, Michaely 2005), will moderate the contagion effect of earnings management. Given recent emphasis on investors' activism (Cornett, Marcus et al. 2007, Callen, Fang 2013, Huang, Paul 2016) it would be interesting to know whether institutions with large shareholdings will actively monitor managerial behavior and thus provide a deterrent to management against the spread of earnings management. We also conduct additional analyses to examine whether the impact of interconnected directors on earnings management would differ when interconnected directors are executive or independent directors. Because executive directors are also associated with the decision making process, we argue that the contagion effect is expected to be stronger when interconnected directors are executive, especially when they hold senior executive positions in the affected firms.

In order to identify the sample for the study, we started with all firms irrespective of the fact whether they restated their reported earnings or not. First, we identify firm years when managers engaged in aggressive earnings management. Firms years with top quantile of discretionary accruals are identified as the subsample of aggressive earnings management firms, i.e. contagious firm observations (N= 11,845 observations). Second, we identify firm years that have common directors with contagious firm observations. We identify the firm year observations from the non-contagious firm year subsample with interconnected directors with contagious firm year observations and classify them as the target firm year observations (N= 47,379 observations). Third, we identify the number of links (number of common directors) between contagious and affected firms. Fourth, we examine whether interlinked directors have accounting expertise, finance expertise, or other non-accounting expertise. We capture and code different types of links, such as a single director link, multi-directors links, link with accounting expertise, finance expertise, or other non-accounting expertise.

We run OLS regressions with absolute value of discretionary accruals of the affected firm year observations as a dependent variable, and use the variables of interconnectedness of directors between the contagious firms and affected firms as test variables, and also use several control variables that are expected to influence the dependent variable of discretionary accruals. The results show that there is a positive association between absolute discretionary accruals ($|DA|$) and the variable of interconnected (common) directors (D_CD), indicating that absolute discretionary accruals are high for the affected firms if they have interconnected directors with firms involved in aggressive earnings management behavior. In other words, there is an earnings

management contagious effect when firms have interconnected directors (common directors) on their corporate boards. Second, we find that discretionary accruals are higher when the percentage of interconnected directors is high, suggesting a higher percentage of interconnected directors has a stronger spillover effect of earnings management. Third, we find that the contagious effect is stronger when the interlinked directors have strictly accounting expertise, but we find no incremental effect of interlinked directors with finance expertise or other non-accounting expertise. Fourth, our findings show that large institutional shareholdings have no significant impact on the spillover effect of earnings management from contagious firms to the affected firms. This finding suggests institutional shareholders do not concern themselves with monitoring managerial behavior of earnings management seriously, and this is inconsistent with the existing evidence in the literature on the role of institutions with large shareholdings (e.g. (Fernandes, M. Fich 2009, Williamson, Taillard et al. 2010)). Fifth, we also find that there is no significant difference in the impact of independent or executive directors of the affected firms, suggesting that the spillover effect is not influenced by directors' independence on corporate boards.

Our findings make contributions to the existing literature in the following ways. First, our findings document that aggressive earnings management by firms is likely to spill over to other firms if they have common directors on their corporate boards, which will reduce the quality of information disclosed by the affected firms. The spillover effect is not limited to the restatement of reported earnings as a result of earnings management, as reported in the literature. Findings show that aggressive earnings management is expected to trigger the contagion effect when there are interconnected directors and even when there is no restatement of the reported earnings. The spill-over effect is stronger when the

number of common directors on corporate boards increases.

Secondly, the spill-over effect is stronger especially when common directors have accounting expertise. This finding contributes to the existing literature on the corporate board directors' expertise and their monitoring role. Fernandes and M. Fich (2009) and Williamson, Taillard et al. (2010), who have examined the role of financial experience of banks' outside directors on the banks' risk and performance during the credit risk, report that they played a significant role (e.g. (Wang, Xie et al. 2015)). We, on the other hand, study a large cross-section of firms spanning a broad range of industries, and find that only accounting expertise has impact on the spillover effect, which aggravates it.

Third, our paper sheds light on the rationality of SEC's recent requirements for proxy disclosure that companies are required to provide investors with information on each director's "particular experience, qualifications, attributes or skills that qualified that person to serve as a director of the company", and "any directorships held by each director and nominee at any time during the past five years at public companies and registered investment companies" (SEC 2009). Our results support the premise that disclosure of this information will be useful because information on the background and expertise of directors would enable investors to make judgment on the expected role of these directors in monitoring managerial behavior. As expected by the SEC, disclosing background information on directors "will help shareholders make more informed voting and investment decisions" (SEC 2009).

Fourth, it contributes to the literature on the interaction between directors' independence and their monitoring role. Previous studies show that when cost of information acquisition is low, independent directors are effective in reducing earning

management and enhancing firm performance through their monitoring role (Fernandes, M. Fich 2009, Williamson, Taillard et al. 2010). Furthermore, Wang et al. (2015) show that industry expertise enhances independent directors' ability to fulfill monitoring function. Our results show that independent directors with accounting expertise may use their expertise to help managers in advancing the spillover of earnings management rather providing effective monitoring to stop the spillover effect.

The reminder of the paper is organized as follows. In Section 2, we review prior literature related to this paper and present the development of hypotheses. Section 3 describes the sample selection and explains the empirical research design. Section 4 discusses the results and their implications. Section 5 contains the concluding remarks.

2. Literature review and hypotheses development

We review literature on the network among corporate board directors, earnings management, and corporate boards that is relevant to this study.

2.1 Corporate Directors' Network

The corporate board directors' network has been examined in the literature from different perspectives. Some studies have evaluated how this network affects firms' specific operating, investing, and financing decisions. These studies have particularly examined the impact of board network on poison-pill adoption (Gerald F. Davis 1991), acquisition of firms (Pamela R. Haunschild 1993), migration from the listing in NASDAQ to NYSE (Hayagreeva Rao, Gerald F. Davis et al. 2000), backdating of stock options (John Bizjak, Michael Lemmon et al. 2009), stock option expensing (Reppenhagen 2010), offers of private equity (Stuart, Yim 2010), and use of tax shelter (Brown 2011).

Another group of studies have focused on the benefits and costs associated with board directors' network. For example, Larker et al. (2013) and Omer et al. (Omer, Shelley et al. 2016) provide evidence that firms with central board directors perform better, as reflected in the abnormal stock returns, whereas Guedj and Barnea (2009) conclude that director networks also have an impact on executive compensation. The most relevant study for this paper is by Chiu et al. (2013), which documents that directors' network also has an impact on the managers' financial reporting behavior. They specifically conclude that there is spillover effect of earnings management when firms are interconnected through common board members and earnings management results in restatement of the financial statements by contagious firms. We extend this line of research and examine whether aggressive earnings management reflected by absolute discretionary accruals has a contagion impact on other firms whose directors are also directors on the contagious firms at the same time.

2.2 Earnings Management Behavior and Corporate Boards

There is an impressive body of existing literature that examines the association between corporate boards and earnings management. Though Klein (2002) finds the level of earnings management is negatively associated with board and audit committee independence, other studies provide conflicting evidence. Some studies document insignificant association between board independence and earnings management (Irene Karamanou, Nikos Vafeas 2005, David F. Larcker, Scott A. Richardson et al. 2007), whereas others point out that the lack of significant results may be due to the endogeneity problem (Guay 2008). Bushman (2009) highlights the endogeneity problem between board independence and earnings management, i.e. board independence and earnings management could be endogenously determined by the same unobservable firm's or

person's characteristics.

Extending Bushman's (2009) line of research, we point out that directors' certain personal characteristics and directors' network across firms may influence their monitoring role over managers' earnings management behavior. We explain that inconclusive results in the literature on the monitoring role of independent directors may also be contaminated by the personal background of interconnected directors. Specifically, if independent directors are also members of boards of other firms and especially if they have accounting expertise and experience, the effectiveness of their monitoring behavior will differ from directors without these characteristics. We extend the existing research on earnings management and examine whether the spill-over effect of aggressive earnings management behavior of managers from contagious firms on the manager behavior of affected firms is influenced by other factors.

Directors' expertise is especially considered to be an important characteristic of board directors. The corporate board directors may have expertise in one of the following areas: financial, accounting, legal, and political (Burak Güner, Malmendier et al. 2008, Jayanthi Krishnan, Yuan Wen et al. 2011). Fernandes and Fich (2009) and Williamson et al. (2010) have examined the impact of financial experience of bank director on banks' risk and performance during the credit crisis, whereas Dass et al. (2014) have explained the impact of directors' expertise in the downstream (supplier) and upstream (customer) industry on firm performance. We examine in this study whether accounting expertise would influence the spillover effect of earnings management from contagious firms to the affected firms.

2.3 Hypotheses

2.3.1 Earning Management and Commonality of Directors on Corporate Boards

Theoretical research on social network suggests that human behavior can spread across firms through a series of mechanisms, especially through a (Bikhchandani, David et al. 1992). Motivation that triggers the spread of behavior can be provided by human psychology and also by economic rationality (Lones Smith, Peter Sørensen 2000, Acemoglu, Ozdaglar et al. 2010, Banerjee, Fudenberg 2004, Golub, Jackson 2010). The social psychology literature documents that individuals in the same group tend to conform to each other's behavior (Lin, Wu et al. 2014, Milgram 1963, Lin 2014). The results of empirical studies in the business environment provide support to these theoretical arguments and document that human behavior affects the spread of spillover effect, i.e. the transfer of knowledge from one firm to other firms through human behavior, especially when it is positive knowledge (Asch 1951, Milgram 1963). Some studies have shown that commonality in directors on corporate boards may serve as an important transferability mechanism that facilitates spillover of negative knowledge also from one firm to another firm (Chiu, Teoh et al. 2013). Staddon (1983) has pointed out that individuals pick up bad habits sooner than good habits.

We extend Chiu et al.'s (2013) line of research and examine whether commonality in directors on corporate boards of firms results in spread of earnings management behavior from one firm to another. In other words, does earnings management behavior gets transferred from one firm to another when there is interlocking of directors. The existing study by Chiu et al. (2013) documents that earnings management behavior of firms that restate their financial statements spills over to other firms if they have common directors

on their corporate boards. In this study, we argue that aggressive earnings management behavior in one firm, even if firms do not restate their financial statements, will spill over to other firms if directors on their corporate board directors also serve on the corporate board of the firm that engages in aggressive earnings management. It is well documented in the literature that corporate boards are expected to provide effective advice and monitoring so that undesirable managerial behavior that reduces the reliability of information for investors and acts against enhancing firm value, is discouraged (John, Senbet 1998, Eisenberg, Sundgren et al. 1998, Baysinger, Butler 1985). If commonality of directors across firms results in transfer of earnings management behavior, it will work against achieving the desired objectives of higher reliability and enhancing firm value. Thus, it is an empirical question whether commonality of directors on different firms would work as an undesirable characteristic of corporate boards that would encourage transfer of earnings management behavior that reduces reliability of reported information and also results in lower firm value.

The spillover effect of earnings management from the firm that engages in aggressive earnings management to other firms with common directors is supported by the following two factors. First, as mentioned earlier, it is well established in the literature that there is spillover effect of knowledge among individuals when they work together or interact with one another (e.g. (Lin, Wu et al. 2014, Milgram 1963, Lin 2014)). Based on this evidence, we argue that the mechanism established by commonality of directors on the boards of directors will facilitate transfer of earnings management behavior from contagious firms to the affected firms. In other words, whatever common directors learn in one firm, including earnings management, may consider it appropriate to apply that

knowledge in other firms. Thus, we expect common directors on corporate boards of firms use earnings management knowledge gained from a firm with aggressive earnings management to other firms because it is considered to be an acceptable behavior. Transfer of earnings management behavior is also supported by the evidence in the literature that individuals pick up bad habits sooner than good habits (Staddon 1983).

Second, it is documented in the social literature (Hillman, Nicholson et al. 2008, Weisbach, Hermalin 1998, Stiles 2001, Gino, Ayal et al. 2009) that directors' tolerance may play an important role in accepting bad behavior of managers of earnings management in a firm. Because tolerance is likely to get imbibed in managers' personal characteristics, it will encourage directors to accept the earnings management behavior as a given norm across firms (Gino, Ayal et al. 2009, Sah 1991). Chiu et al. (2013) explain in their study how rational individuals follow the behavior of others based on their direct observations. Consistent with their findings, we argue that bad behavior of firms which engage in earnings management is also carried over to other firms with common directors. Chiu et al.'s (2013) findings, however, show that the spillover effect will take place when earnings management of contagious firms results in restating the financial statements. We extend their logic of the spillover effect of earnings management to all firms whether they restate their financial statements or not.

Associated with arguments presented above, there is another question: Whether an increase in the number of common directors between contagious and affected firms will strengthen or aggravate the spillover effect. It can be argued that as the number of interlinked directors between contagious and affected increases, the likelihood of spillover effect and the strength of this effect would increase because a higher number of interlinked

directors will have a stronger voice and stronger influence on managerial behavior. We develop the following hypotheses to test above expectations:

H1a: There is a positive association between absolute discretionary accruals and commonality of directors on the corporate boards of contagious and affected firms.

H1b: The positive association between absolute discretionary accruals and commonality of directors becomes stronger when the number of common directors on the contagious and affected firms increases.

2.3.2. Role of Accounting Expertise

The SEC (2002) defines financial expertise based on : “(1) education and experience as a principal financial officer, principle accounting officer, controller, public accountant or auditor or experience in one or more positions that involve the performance of similar functions; (2) experience actively supervising a principal financial officer, principal accounting officer, controller, public accountant, auditor or person performing similar functions; (3) experience overseeing or assessing the performance of companies or public accountants with respect to the preparation, auditing or evaluation of financial statement; or (4) other relevant experience.”

Based on this definition, Badolato et al. (2014) present that financial expertise can be classified into the following three subcategories: accounting, supervisory, and finance expertise. In this study, we especially focus on accounting expertise because strong accounting background of principle accounting officers, controllers, public accountants or auditors or experience in one or more these positions will enable them to have a better understanding of the accrual accounting methodology. They will be able to have a better

understanding of the firm's financial and accounting systems, and the accounting procedures used by managers to manipulate the reported earnings number, etc. They are also expected to be more sensitive to the quality of reported financial information. Moreover, given their knowledge of rules and regulations, they can provide appropriate guidance to prepare the financial reports and provide information on the perceived cost and benefit associated with earnings management (Bikhchandani, David et al. 1992). They can also guide management how and under what circumstances a specific accounting item can be managed, and what would be the possibility that earnings management would be caught and what would be the associated (Chiu, Teoh et al. 2013).

On one hand, accounting expertise of directors can play an important role in providing effective monitoring of managerial behavior that may moderate the spillover effect of earnings management. On the other hand, this expertise can be used to guide and advise management how to use earnings management that can minimize penalty if earnings management is caught. In view of the argument that spillover of earnings management may be considered as an acceptable behavior, we examine whether the spillover effect is stronger when interlinked director(s) has (have) accounting expertise or accounting expertise would moderate the spillover effect.

Directors are considered to have accounting expertise if they serve or have experience as Chief Financial Officer (CFO), Chief Accounting Officer (CAO), or Controller. Information on their professional background and experience is provided in the Capital IQ database, which gives information on titles held by each director since 1950s. We construct a list of titles based on our search of Capital IQ data base (see Appendix B). We find that corporate officers with the following titles in the database generally have

accounting expertise: CFO, CAO, Controller, and other accounting professional. Thus, we define directors that experience on similar positions as accounting expertise. Similarly, we define directors with finance expertise if they have held one or more of the following positions since 1950: Head of Corporate Finance, Head of Investment Banking, Investment Banking Professional, Investment Professional, Chief Investment Officer, Treasurer, and analysts. Directors with experience in other areas, such as marketing, legal, IT, production, etc., are considered directors with non-financial accounting expertise.

The following null hypothesis is developed to test the impact of accounting expertise of common directors on the association between absolute discretionary accruals and commonality in directors:

H2: There is no effect of accounting expertise on the positive association between absolute discretionary accruals and commonality of directors on the Corporate Boards of contagious and affected firms.

2.3.3 Role of Institutional Shareholders

Whereas independent corporate boards and internal control mechanism provide internal control mechanism, institutional shareholdings provide strong external control mechanism (Ajinkya, Bhojraj et al. 2005, Roychowdhury 2006, Cornett, Marcus et al. 2007, Chung, Firth et al. 2002). It has been presented in the literature that institutional shareholders with substantial shareholdings are becoming more active (Hadani, Goranova et al. 2011, Denes, Karpoff et al. 2017, Gillan, Starks 2000) and they are now more inclined to use their power to ensure that managers' decisions are in the best interest of shareholders and that the reliability of reported information is ensured so that investors can make more

informed investment decisions. Institutional shareholders' activism is especially evident in the firms' disclosure policies, especially comprehensive disclosures and high reliability of disclosures (Dan S. Dhaliwal, Oliver Zhen Li et al. 2011, Bushee, Noe 2000, WELKER 1995).

Based on evidence in the literature, it can be argued that higher institutional shareholdings will be associated with lower spillover effect of earnings management behavior from contagious firms to the affected firms. Thus, strict monitoring by institutional shareholders will lower the use of earnings management by affected firms. But on the other hand, findings of some studies show that institutional shareholders are not that active in monitoring managerial behavior because they leave the monitoring function for the internal control system or the board of directors, and they remain focused on investments (Burns, Kedia et al. 2010, Agrawal, Mandelker 1990, Chen, Harford et al. 2007, Hadani, Goranova et al. 2011). If institutional shareholders are not actively taking part in monitoring managerial behavior, we argue that there will be no significant impact of institutional shareholdings on the association between discretionary accruals and commonality of directors. We develop a null hypothesis to the impact of institutional shareholdings on the association between discretionary accruals and common directors on corporate boards of contagious and affected firms.

H3: There is no significant impact of institutional shareholders on the positive association between absolute discretionary accruals and commonality of directors on the Corporate Boards of contagious and affected firms.

3. Sample Selection and Research Design

This section discusses the procedure for sample selection, presents the empirical

research design, and explains proxies used for different factors included in the analyses.

3.1 Sample Selection

Though data on corporate boards are available from different sources, we decided to extract it from the Capital IQ data base that covers over 4.5 million professionals and over 2.4 million people including executives of private and public companies and their board members, and investment professionals. Moreover, this dataset is available on WRDS and thus is easily accessible. We decided not to use the Risk Metrics because it primarily focuses on relatively large firms in the S&P 1500, and we did not use the BoardEx data because it has changed its data collection methodology several times, which reduces the comparativeness of data across different time periods.

We start the sample selection process with all firm observations in the Capital IQ data base for the period from 2003 to 2015 ($N = 214,241$). We drop firms with head offices outside North America and also delete Utilities and Financial. Additionally, we drop observations with missing data on directors and control variables. As a result of this screening process, we are left with 59,224 observations. These observations are used to calculate discretionary accruals. Data for calculation of discretionary accruals and other financial data are extracted from the Compustat Financial database. Using the modified Jones model, adjusted with growth rate, we calculate discretionary accruals for all observations. Next, we rank all observations based on the descending order of absolute discretionary accruals for each year. We divide the ranked sample into five quintiles. Firm-year observations in the top quintile, i.e. 11,870 observations, with highest discretionary accruals are considered as highly aggressive earnings management firm year observations, which are identified as earnings management contagious firms. The remaining

observations of 47,379 are the test group observations, which are termed as affected firms, or target firms. The sample selection details are provided in Table 1.1, Panel A.

We identify different types of directors' links between contagious and affected firms based on data on corporate board directors for the sample firms over the sample period. The total number of directors on corporate boards of sample for sample years is 262, 649 (Table 1.1, Panel B)

[Insert Table 1.1 here]

3.2 Identification of Common Directors between Contagious and Affected Firms

Consistent with Larcker et al.'s (2013) definition on the corporate board network connections, we consider firms as connected (interlinked) if they share at least one director on their corporate boards. If there is no common director on the corporate boards of contagious and affected firms, there is no connection between the boards and thus between firms.

We capture connections between directors of contagious and affected firms by creating different indicator variables. First, we classify connected firms and non-connected firms by creating an indicator variable of common directors (D_CD), which is coded as 1 when firms are connected with at least one common director, and 0 otherwise, i.e. non-connected firms. Next we create the indicator variable D_CD1, which takes the value of 1 when there is only one common director, otherwise 0; indicator variable D_CD_MT1 which is coded as 1 when there are two or more common directors on the contagious and affected firms, otherwise 0. We create the variable NUM_CD to reflect the number of common directors on the boards of contagious and affected firms. This variable is coded

as 0 where is no common directors on the two groups of the firms, and as 1, 2, 3 when there are 1, 2, or 3 common directors respectively, the value of this variable is continuous value of number of years. In addition, we create the variable for percentage of common directors. Additionally, we identify whether common directors on the contagious firms holding the position of an independent or executive director on the affected firms, where the executive officers include the Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Operating Officer (COO), and Chief Accounting Officer (CAO).

3.3 Calculation of Discretionary Accruals

We calculate discretionary accruals using the following modified Jones Model with Growth (ROA) (Kothari, Li et al. 2009) estimated by two-digit SIC code and year (requiring 10 firm-year observations in each industry):

$$\frac{TAC_{jt}}{AT_{jt-1}} = \alpha \frac{1}{AT_{jt-1}} + \beta \frac{(\Delta REV_{jt} - \Delta AR_{jt})}{AT_{jt-1}} + \gamma \frac{PPE_{jt}}{AT_{jt-1}} + \delta ROA_{jt} + e_{jt} \quad (1)$$

We measure $|DA|$ as the absolute value of the error term for firm i in year t from the above equation.

3.4 Regression Model

To test hypothesis H1, we use the regression model in equation (2) and examine whether the affected firms that common directors with contagious firms (D_CD) are associated with higher discretionary accruals. In other words, we examine whether corporate board connections have a spillover effect on earnings management that results in higher discretionary accruals.

$$\begin{aligned}
|DA_i| = & \beta_0 + \beta_1 D_CD_i + \beta_2 LAG_|DA|_i + \beta_3 BOARD_SIZE_i + \beta_4 NUM_LINK_i \\
& + \beta_5 FIRM_SIZE_i + \beta_6 OCF_i + \beta_7 LOSS_i + \beta_8 ROA_i + \beta_9 LEVERAGE_i \\
& + \beta_{10} DELTA_SIZE_i \\
& + \beta_{11} MB_i + \beta_{12} INST_OWNERSHIP_i + \beta_{13} FIRM_AGE_i \\
& + Year\ Fixed\ Effects + Industry\ Fixed\ Effects + \varepsilon_i^1 \quad (2)
\end{aligned}$$

All variables are defined in Appendix A. We use absolute value of discretionary (abnormal) accruals of test firms as the dependent variable. We also use this equation to test whether one or two and more common directors will make difference in the association between board connections and earnings management. We also use this equation to examine whether a higher number of connections will have stronger association earnings management, and replace C_CD with NUM_CD.

We examine the impact of accounting and finance expertise on the association between board connections and discretionary accruals by including an interaction variable between connection and expertise (equation 3).

$$\begin{aligned}
|DA_i| = & \beta_0 + \beta_1 D_CD_i + \beta_2 EXP_ACC_i + \beta_3 D_CD_i * EXP_ACC_i + \beta_4 EXP_FIN_i \\
& + \beta_5 D_CD_i * EXP_FIN_i + \beta_i Controls_i + \varepsilon_i \quad (3)
\end{aligned}$$

First, we conduct this test by including the interaction variables with accounting and finance expertise in the sample equation, and then we conduct tests separately for the two interaction variables. Similarly, we evaluate the role of institutional shareholdings on the association between discretionary accruals and common directors by including an interaction variable between board connection and high institutional shareholdings and also

¹ We also include independence in Model (2). The results are untabulated because the sample would substantially decrease after including independence measure.

an interaction variable between the number of common directors (NUM_CD) and institutional shareholdings (INST_HIGH).

We use the regression model in equation (4) to test the impact of institutional shareholdings (H3) on the association between discretionary accruals and common directors.

$$|DA_i| = \beta_0 + \beta_1 CD_i + \beta_2 INST_HIGH_i + \beta_3 D_CD_i * INST_HIGH_i + \beta_i Controls_i + \varepsilon_i \quad (4)$$

The variable of INST_HIGH is set to one when the total percentage of institutional shareholdings compared to the outstanding shares is greater than 70%, to indicate significant institutional shareholdings. We also conduct tests on other three institutional ownership variables PERCENT_BLOCK, NUM_BLOCK, and PERCENT_LARGEST as alternative proxies for high institutional shareholdings (David F. Larcker, Scott A. Richardson et al. 2007).

4. Empirical results

4.1 Summary Statistics and Correlations

In Panel A, Table 1.2, we provide descriptive statistics on firm-related variables. The statistics show that the mean of discretionary accruals for the total sample is .228, whereas median is 0.132. After implementation of SOX, the average size of corporate boards increased about 60% from 5 board members in 2003 to 8 board members in 2015. Consequently, the average number of total links (NUM_CD) for sample firm-years also increased by 105% from a low of 2.2 in 2003 to a high of 4.5 in 2015. With regard to expertise of board directors, the results show that 7.6% of them are defined as accounting

expertise according to SOX (2002) and this percentage increased to 14.8% in 2015. This trend is consistent with the requirements in SOX, which emphasizes the importance and need for financial expertise on the board of directors to improve the quality of financial reported information. The trends of board size, percentage of accounting expertise, and the number of links through board of directors over the sample years are also depicted in Figure 1.2.

[Insert Table 1.2 here]

[Insert Figure 1.2 here]

In Panel B, Table 1.2, we describe characteristics of corporate board connections by industry. Even though firms in some industry hold relatively small boards, such as Energy and Business Equipment, the percentage of accounting expertise on the board for those two industries are the highest (13.28% and 12.27%, respectively).

Panel D provides correlation statistics among different variables. The high and significant correlations between BOARD_SIZE, NUM_LINK, and D_CD suggest when the board is large and number of links with other firms increases, and potential of exposure to contagious firms also increases. Therefore, these two variables are important for our analyses.

4.2 Regression Results

4.2.1 Earnings Management and Connections to Contagious Firms

In Table 1.3, the results contained in column (1) based on the indicator variable of interlinks (D_CD) indicate that discretionary accruals of affected firms are significantly

positively associated with board interlinks between contagious and affected firms (coeff.=.0282; sig. = 1%). The positive association indicates that discretionary accruals of affected firms are higher when directors on their boards are also serving on the corporate board of the contagious firm (firm with aggressive earnings management). We interpret this finding to suggest that there is a spillover effect of earnings management from the contagious firm to the affected firms. This contagion effect is not dependent on the restatement of financial statements by the contagious firms. Instead, the spillover effect takes place even when contagious firms do not issue restatements. Consistent with the existing literature, coefficients of the following control variables are statistically significant in the expected direction: FIRM_SIZE, BOARD_SIZE, OCF, LOSS, ROA, MB, and INST_OWNERSHIP. This finding supports our hypothesis H1a that there is spillover effect of earnings management when there is interlinking among corporate board directors of contagious and affected firms.

[Insert Table 1.3 here]

To have a better understanding of the impact of interlinked corporate boards of contagious and affected firms on earnings management, we run regression tests with test variables of different degrees of interlinking of directors. We run regressions based on the test variables when there is only one board member is interlinked (D_CD1), and we run a separate test when more than one board members are interlinked (D_CD_MT1). The results in column (2) show that both coefficients of D_CD1 and C_CD_M1 are positive, but they statistically significant only for C_CD_M1. We also find that the coefficient of D_CD_MT1 is higher than that of D_CD1, and F-test result shows that the difference is

statistically significant at the 0.001 level.

The results contained in Table 1.3 thus indicate that the spillover effect especially takes place when at least two or more directors are common on the contagious and affected firms. When there is only one common director on the boards of contagious and affected firms, the results show a positive coefficient but statistically insignificant. Apparently, the spillover effect is not significant when there is only one common director. The spillover effect of earnings management becomes statistically significant there are 2 or more members are common the corporate boards of contagious and affected firms.

4.2.2 High Number of Common Directors and Earnings Management

Next we examine whether a higher number of common directors will have a stronger contagion effect. In Column (3) of Table 1.3, we use a variable NUM_CD, which reflects the number of common directors. We also conduct a test by using the percentage of common directors instead of absolute numbers of common directors. The percentage of common directors is obtained by dividing the percentage of common directors by the total number of directors of an affected firm

The results based on NUM_CD (column 3) show that the coefficient is significantly positive and statistically significant (coefficient =0.023; p-value=0.001), confirming that a higher number of common directors intensifies the spillover effect of earnings management from contagious firms to the affected firms. Similarly, the results for the PERCENT_CD variable (column 4) are significantly positive (coefficient =0.1373; p-value=0.011). These results thus show that the higher the percentage of common directors on the corporate boards, the higher is the level of discretionary accruals. This finding supports thus our hypothesis H1b that a higher number of interlinked directors of affected firms with

contagious firms results in higher spillover effect, reflected by higher discretionary accruals.

4.2.3 Role of Financial Expertise in Accounting on the Earnings Management Contagion

We examine the role of accounting and finance expertise in the spillover effect of earnings management from contagious to affected firms by including interaction variables with accounting expertise and finance expertise (equation 3). First, we include both interaction variables in the same equation. Second, we conduct tests separately for each interaction variable to avoid bias in the results when two interactions are included. The regression results are contained in Table 1.4.

[Insert Table 1.4 here]

The results contained in model 1 are based on an equation that includes both interaction variables on accounting and finance expertise. The coefficient of D_CD is positive and statistically significant at .001 level, and coefficient of the interaction variable between common directors and accounting expertise (D_CD*EXP_ACC) is also positive and statistically significant at the 5% level (coeff. = 0.126). These results suggest that accounting expertise makes a significant incremental contribution to the positive association between discretionary accruals and common directors. The results on the finance expertise show that the coefficient of interaction is positive, but insignificant (coeff. = .0064), suggesting that finance expertise has no significant incremental contribution to the positive association between discretionary accruals and common directors. The regression results of tests based separately on accounting and finance expertise are similar. Thus, our results indicate that there is an incremental effect of accounting expertise on

spillover effect of earnings management, whereas incremental effect of finance expertise is insignificant. These results provide support to our hypothesis H2 that accounting expertise of common directors strengthens the spillover effect of earnings management from contagious firms to the affected firms, whereas finance expertise has no significant incremental impact. As discussed in the hypothesis section, accounting knowledge and expertise in understanding the intricacies and consequences of accrual accounting, the spillover effect is stronger, whereas directors with financial expertise are not likely to have any significant impact because they might lack insight into accounting details of accrual accounting.

4.2.4 Role of Institutional Shareholders on the Earnings Management Contagion

We evaluate the impact of institutional shareholdings on the association between discretionary accruals and common directors by including an interaction variable between common directors and institutional shareholdings and the results are contained in Table 1.5.

[Insert Table 1.5 here]

The results contained in Model 1 show that coefficient of D_CD is positive and statistically significant at the .001 level, and the coefficient of the interaction variable between common directors and institutional shareholders (D_CD * INST_HIGH) is negative and statistically insignificant (coefficient = -.0027). These results support our null hypothesis that there is no significant impact of shareholdings on the association between discretionary accruals and common directors, suggesting that there is no constraining effect of large shareholdings on the spillover effect of earnings management from contagious firm to the affected firms. Despite investor activism, institutional

shareholders still do not provide effective monitoring that would discourage spillover effect of earnings management. We also include other three institutional ownership variables: (1) the percentage of blockholders, (2) the shares holding by blockholders, (3) the percentage of shareholdings that the largest institutional holders own for alternative proxies (David F. Larcker, Scott A. Richardson et al. 2007), and the results are similar.

4.3 Sensitivity Test for H1

We conduct a sensitivity test by replacing the continuous dependent variable of DA in Equation (2) with a dummy variable for higher absolute values of discretionary accruals, where, $|DA|_{HIGH}$ is set equal to 1 for firm-years with highest discretionary accruals within the same industry, reflected by the top quantile of DA for each industry year. The untabulated results show that all test variables have significantly positive coefficients. These results suggest that the affected firms have higher discretionary accruals compared to non-affected peers in their peer group of higher earnings management.

4.4 Robustness Tests

In this section, we examine whether (i) the results are affected by other earnings management incentives; (ii) the results are caused by the earnings management proxy we employee; and (iii) the results are robust to endogenizing a company's decision to link with other firms by sharing common directors.

4.4.1 Controlling for Earnings Management Incentives

It is well documented in the literature that there is strong motivation for management to engage in earnings management when there are mergers and acquisition (M&A) (Louis 2004) and/or issuance of new debt or equity (ISSUE) (Teoh, Welch et al. 1998, Siew Hong Teoh, Ivo Welch et al. 1998). We conduct analyses by controlling the

effect of these variables individually and jointly. The results are contained in Table 1.6. In Model (1) and (2), we control for M&A and Issue separately. The results show that both of these variables are significantly positive (M&A coefficient = 0.031; Issue coefficient = 0.013), but they have no significant impact on the association on D_CD. The coefficient of D_CD remains positive and significant. Our main results remain unchanged when both of these variables are included in the same regression test.

[Insert Table 1.6 here]

4.4.2 Alternative Proxy for Earnings Management

To test the robustness of findings, we replace aggressive earnings management observations with the restatement of financial restatements. We use the U.S. Government Accountability Office's (GAO) recent release of restatements from July 1, 2002 to June 30, 2006 to identify the contagious firms. Consistent with Chiu et al. (2013), we define three-year period as the contagious period, and firms restating their financial reports during the contagious period are identified as contagious firms. Next, we identify interlinks among directors of contagious and affected firms. We run regression test to evaluate the association between restatements and directors' links.

The results are contained in Table 1.7. The results show that the coefficient of association between restatement and interlinks is significantly positive, suggesting that firms with interlinks are more likely to restate the earnings because of high earnings management compared to the firms without links. In column (2), the coefficient on D_CD is positive and significant (p-value=0.056), and the interaction with accounting expertise (EXP_ACC) is also significantly positive. The results support our argument that the

earnings contagion effect exists and stronger when the interlinked director has accounting expertise background.

[Insert Table 1.7 here]

4.5 Endogeneity Concern

It is, however, possible that firms planning to engage in earnings management to achieve certain goals or objective, they may appointment directors, who may serve on corporate boards of firms that are engaged in aggressive earnings management. Thus, earnings management by the target firms are not the result of common directors, but appointment of common directors is the result of firms' intention to engage in earnings management. This choice could make it more convenient for them to manage earnings. To address the endogeneity issue, we estimate two-stage least squares (2SLS) regressions. First, we predict target firm needs a common director based on other factors, and in the second step we run regression (equation 2) with the predicted value for common directors.

First of all, we determine coefficients of important variables that will predict a firm's propensity to have common directors with aggressive earnings management firms. To predict the likelihood of linkage of directors with contagious firm (aggressive management firm), we use a logistic regression where the dependent variable, LINK_CONTAGIOUS, is an indicator variable that takes the value of one if the company has a common director with a contagious firm, otherwise zero. The independent variables that create the need for a common director include innovation (proxied by R&D, CITATION, PATENT), size of the company (FIRM_SIZE), complexity (SEGMENTS), leverage (LEV), board size (BSIZE), industry and year fixed effect. The first stage results

are given in Table 1.8, Panel A.

[Insert Table 1.8 here]

The results in Panel A indicate an important role for firm size in the likelihood of having a common director with a contagious firm. Both coefficients for FIRM_SIZE and MKV are positively significant. Besides, firms with larger board size (BOARD_SIZE) are more likely to be linked with contagious firm. Firms with negative income (LOSS=1) have more incentive to have directors from high earnings management company. Lastly, the innovativeness of the company also has an impact on such likelihood.

We next compute the fitted value, P_LINKED, for the likelihood of common directors with contagious company from the above mentioned model, and substitute FLAG_ALINK for D_CD in our main regressions in equation 2. The results displayed in Panel B show that coefficient of P_LINKED is still significantly positive, suggesting that the impact on companies' propensity to have common directors with contagious firms has little impact on our main results that common directors result in higher earnings management.

5. Conclusion

In this study, we have examined whether common directors on contagious and affected firms result in spillover effect of earnings management from the contagious firm to the affected firm. The results of tests are consistent with our expectations that there is a spillover effect of earnings management from aggressive earnings management to other affected firms with. Thus, these results suggest that reported earnings may not be high quality if a firm has director or directors who also serve on the corporate board of a firm

that is associated with aggressive earnings management. Additionally, our findings show that spillover effect of earnings management is stronger when interlinked directors have accounting expertise. We, however, do not find that large institutional shareholdings provide monitoring of managerial behavior of the affected firms to control their behavior of earnings management.

Our findings extend the results of Chiu et al. (2013) study, which show that's the spillover effect when contagious firms with aggressive earnings management also restated their financial statements. Our findings show that the spillover effect applies to interlinked firms even when firms engaged in aggressive earnings management do not restate their financial statements. Our findings however show that the spillover effect may not be that effective when there is only one common director between contagious and affected firms. This effect especially takes place when there are at least 2 common directors, and this spillover effect gets intensified as the number of common directors increases. Additionally, our findings show is strong when the common director has accounting expertise. On the other hand, financial expertise or any expertise other than accounting, is not likely to intensify the spillover effect.

Our findings provide useful information for investors and regulators to evaluate the possibility of earnings management when there are common directors on the corporate boards of firms with aggressive earnings management and affected firms that have directors who are also on the boards of firms with aggressive earnings management. Additional research will useful to examine the life of spillover effect. Will it last for a short life and would disappear after sometime or will its effect stay for a longer time? The results of this study also support the rationality of SEC's recent requirements for proxy disclosure

that firms are required to provide investors with every director's background information, especially "any directorship held by each director and nominee" (SEC 2009).

Figure 1.1 Firm Networks in Year 2000, 2007, and 2015

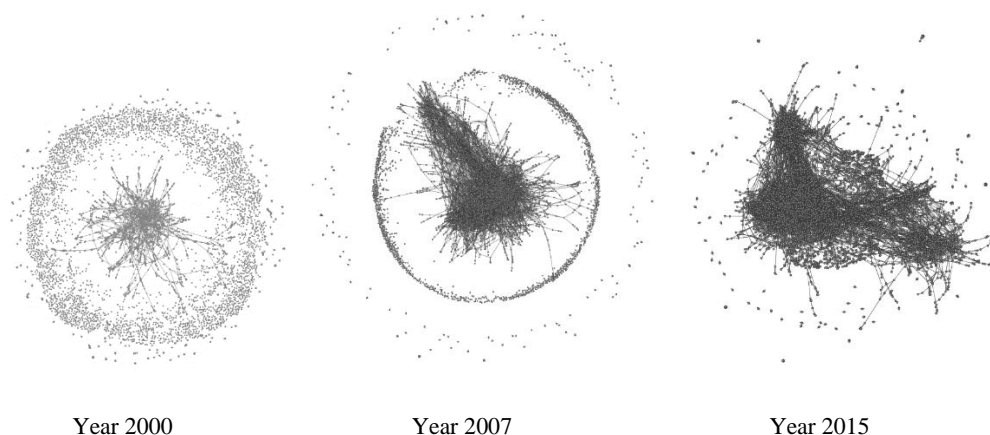


Fig. 1.1 Firm networks in year 2000, 2007, 2015. The figure displays the firm networks built up by common directors and executives shared by different firms in those three years. Each node is an individual company. The link reflects that the firm is connecting with another firm by sharing a common director.

Figure 1.2 The Trend of Board Size, Percentage of Accounting

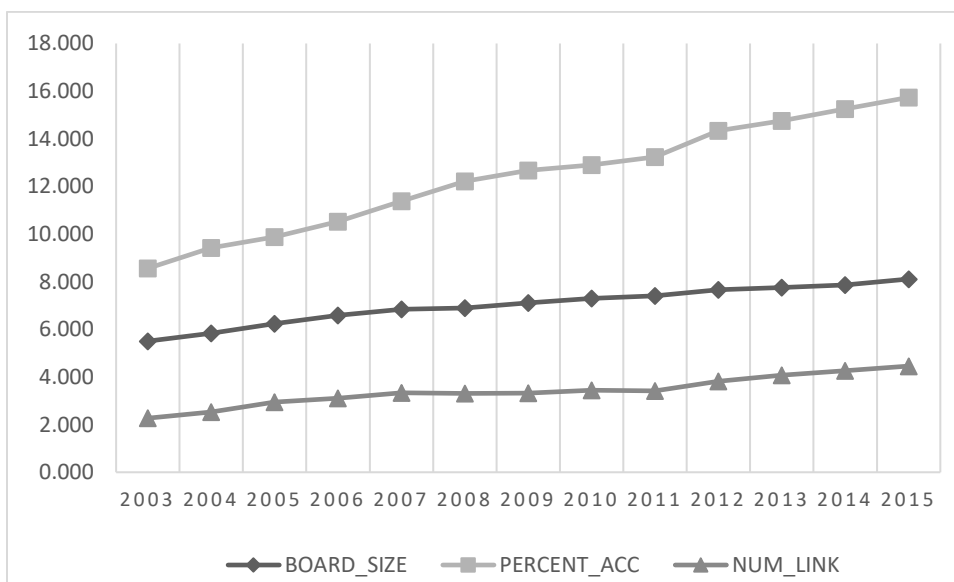


Table 1.1 Sample Selection

Panel A: Sample for firm-year observations	
Capital IQ sample from 2003 to 2015 (firm-year)	214,241
Less:	
Firms outside of North America	21,170
Utilities and Financials	46,691
Missing Board of Directors information	1,067
Missing Financial Data in Compustat to calculate control variables	86,089
Sub Total	59,224
Delete firms in top quintile of discretionary accruals (identified as contagious firms)	11,845
Number of firm-year observations in the sample	47,379

Panel B: Sample for directors for each firm-year observations

Number of firm-year observations	47,379
Expand the firm-year sample into firm-year-director sample ²	262,649

Table 1.2 Descriptive Statistics**Panel A: Number of observations, sample averages and medians by year**

	<i>OBS</i>	<i>/DA/</i>	<i>FIRM SIZE</i>	<i>BOARD SIZE</i>	<i>NUM EXP ACC</i>	<i>NUM EXP FIN</i>	<i>NUM LINK</i>	<i>NUM CD</i>
2003	4012	0.164 (0.115)	4.870 (4.912)	5.504 (5.000)	0.422 (0.000)	0.930 (1.000)	2.270 (1.000)	0.268 (0.000)
2004	3974	0.365 (0.208)	4.820 (4.869)	5.836 (6.000)	0.498 (0.000)	1.007 (1.000)	2.531 (1.000)	0.447 (0.000)
2005	3992	0.180 (0.132)	4.958 (4.966)	6.232 (6.000)	0.571 (0.000)	1.075 (1.000)	2.942 (2.000)	0.409 (0.000)
2006	3895	0.189 (0.133)	5.202 (5.225)	6.585 (7.000)	0.651 (0.000)	1.179 (1.000)	3.111 (2.000)	0.464 (0.000)
2007	3801	0.239 (0.171)	5.259 (5.245)	6.845 (7.000)	0.730 (1.000)	1.251 (1.000)	3.337 (2.000)	0.512 (0.000)
2008	3719	0.177 (0.096)	5.253 (5.333)	6.899 (7.000)	0.796 (1.000)	1.221 (1.000)	3.315 (2.000)	0.418 (0.000)
2009	3574	0.137 (0.083)	5.275 (5.365)	7.109 (7.000)	0.849 (1.000)	1.321 (1.000)	3.327 (2.000)	0.540 (0.000)
2010	3447	0.186 (0.105)	5.443 (5.568)	7.293 (7.000)	0.901 (1.000)	1.370 (1.000)	3.445 (2.000)	0.552 (0.000)
2011	3377	0.323 (0.169)	5.364 (5.549)	7.411 (7.000)	0.926 (1.000)	1.460 (1.000)	3.415 (2.000)	0.615 (0.000)
2012	3310	0.226 (0.128)	5.509 (5.692)	7.655 (7.000)	1.040 (1.000)	1.459 (1.000)	3.822 (3.000)	0.484 (0.000)
2013	3311	0.252	5.476	7.755	1.095	1.471	4.081	0.519

² The number of directors all sample firms and for all sample years.

		(0.161)	(5.724)	(8.000)	(1.000)	(1.000)	(3.000)	(0.000)
2014	3532	0.257	5.405	7.858	1.130	1.596	4.259	0.568
		(0.180)	(5.627)	(8.000)	(1.000)	(1.000)	(3.000)	(0.000)
2015	3435	0.282	5.346	8.111	1.203	1.663	4.457	0.632
		(0.159)	(5.657)	(8.000)	(1.000)	(1.000)	(4.000)	(0.000)
Overall	47379	0.228	6.958	3.042	0.832	1.308	3.374	0.490
		(0.132)	(7.000)	(3.000)	(1.000)	(1.000)	(2.000)	(0.000)

This panel provides the mean and median (in the parentheses) values on firm size, discretionary accruals, boardroom size, number of accounting experts, number of finance expert on the board, and total links with other companies through board members by year. The sample period is from 2003 to 2015. *OBS* is the number of observations. *|DA|* is the absolute value of the performance-adjusted abnormal accruals. *FIRM_SIZE* is calculated as the natural logarithm of total assets. *BOARD_SIZE* is the number of board directors on the board. *NUM_EXP_ACC* (*NUM_EXP_FIN*) is the total number of accounting (finance) expert defined in this study. *NUM_LINK* equals the number of firms that the company is linked with through common directors and senior executive officers. *NUM_CD* is the number of links that the company connects with contagious firms.

Panel B: Number of observations, sample averages and medians by industry

	<i>OBS</i>	<i> DA </i>	<i>FIRM_SIZE</i>	<i>BOARD_SIZE</i>	<i>NUM_EXP_ACC</i>	<i>NUM_EXP_FIN</i>	<i>NUM_LINK</i>	<i>NUM_CD</i>
Consumer NonDurables	2786	0.144 (0.063)	5.772 (5.845)	7.851 (8.000)	0.721 (1.000)	1.214 (1.000)	3.031 (2.000)	0.410 (0.000)
Consumer Durables	1234	0.232 (0.160)	5.517 (5.658)	7.508 (7.000)	0.827 (1.000)	1.273 (1.000)	3.253 (2.000)	0.459 (0.000)
Manufacturing	5247	0.172 (0.074)	5.813 (6.026)	7.363 (7.000)	0.799 (1.000)	1.098 (1.000)	3.611 (2.000)	0.555 (0.000)
Energy	3868	0.207 (0.151)	5.866 (6.100)	6.711 (7.000)	0.891 (1.000)	1.097 (1.000)	4.072 (3.000)	0.481 (0.000)
Chemistry	712	0.412 (0.343)	5.465 (6.107)	7.559 (7.000)	0.786 (1.000)	1.031 (1.000)	3.803 (3.000)	0.572 (0.000)
Business Equipment	9877	0.316 (0.253)	4.869 (4.869)	6.538 (7.000)	0.802 (1.000)	1.480 (1.000)	2.864 (2.000)	0.439 (0.000)
Telecome Service	1415	0.219 (0.130)	6.740 (6.757)	7.647 (7.000)	0.775 (1.000)	1.712 (1.000)	3.771 (3.000)	0.446 (0.000)
Retail	5444	0.105 (0.051)	6.108 (6.261)	7.508 (7.000)	0.740 (1.000)	1.375 (1.000)	3.411 (2.000)	0.355 (0.000)
Healthcare	5332	0.344 (0.253)	4.239 (4.160)	6.833 (7.000)	0.715 (1.000)	1.546 (1.000)	3.327 (2.000)	0.823 (0.000)
Other	11464	0.199 (0.108)	4.742 (4.841)	6.619 (6.000)	0.919 (1.000)	1.127 (1.000)	3.495 (2.000)	0.438 (0.000)
Overall	47379	0.228 (0.132)	5.231 (5.335)	6.958 (7.000)	0.797 (1.000)	1.295 (1.000)	3.374 (2.000)	0.490 (0.000)

This panel provides the mean and median (in the parentheses) values regarding firm size, discretionary accruals, boardroom size, number of accounting expert, number of finance expert on the board, and total links with other companies through board members by industry. We use Fama-French 12 industries classification. Two industries are deleted from our sample (Utilities and Financial). The sample period is from 2003 to 2015.

Panel C: Descriptive Statistics of Firm Characteristics

	Mean	STDEV	P25	Median	P75	Skew
<i>/DA/</i>	0.228	0.249	0.045	0.132	0.333	1.671
<i>FIRM_SIZE</i>	5.231	2.499	3.555	5.335	6.996	-0.286
<i>BOARD_SIZE</i>	6.958	2.921	5.000	7.000	9.000	0.371
<i>NUM_EXP_ACC</i>	0.868	0.906	0.000	1.000	1.000	1.020
<i>NUM_EXP_FIN</i>	2.803	1.761	2.000	3.000	4.000	0.699
<i>NUM_LINK</i>	3.374	3.703	0.000	2.000	5.000	1.639
<i>NUM_CD</i>	0.490	0.985	0.000	0.000	1.000	3.353
<i>OCF</i>	-0.014	0.405	-0.041	0.062	0.129	-9.699
<i>LOSS</i>	0.454	0.498	0.000	0.000	1.000	0.186
<i>ROA</i>	-0.163	1.134	-0.128	0.013	0.070	-16.652
<i>LEVERAGE</i>	0.188	0.291	0.000	0.079	0.277	3.385
<i>DELTA_SALE</i>	0.074	0.335	-0.020	0.033	0.150	2.100
<i>MB</i>	2.562	7.684	0.949	1.797	3.289	0.895
<i>INST_OWNERSHIP</i>	0.145	0.286	0.000	0.000	0.022	1.709
<i>FIRM_AGE</i>	18.971	14.257	9.000	14.000	24.000	1.327

This panel provides descriptive statistics for test variables and control variables. The sample period is from 2003 to 2015. */DA/* is the absolute value of the performance-adjusted abnormal accruals. *FIRM_SIZE* is calculated as the natural logarithm of total assets. *BOARD_SIZE* is the number of board directors on the board. *NUM_EXP_ACC* (*NUM_EXP_FIN*) is the total number of accounting (finance) expert defined in this study. *NUM_LINK* equals the number of firms that the company is linked with through common directors and senior executive officers. *NUM_CD* is the number of links that the company connects with contagious firms. See Appendix A for definitions of other variables.

Panel D: The Pearson Correlations															
	<i>Variables</i>	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	<i> DA </i>														
2	<i>D_CD</i>	0.016													
3	<i>NUM_CD</i>	0.016	1.000												
4	<i>LAG_ DA </i>	0.163	-0.006	-0.006											
5	<i>BOARD_SIZE</i>	-0.071	0.208	0.208	-0.066										
6	<i>NUM_LIN_K</i>	-0.050	0.348	0.348	-0.052	0.506									
7	<i>FIRM_SIZE</i>	-0.164	0.181	0.181	-0.178	0.495	0.441								
8	<i>OCF</i>	-0.088	0.024	0.024	-0.200	0.134	0.104	0.379							
9	<i>LOSS</i>	0.076	-0.040	-0.040	0.100	-0.191	-0.090	-0.446	-0.324						
10	<i>ROA</i>	-0.048	0.028	0.028	-0.162	0.106	0.081	0.283	0.773	-0.221					
11	<i>LEVERAGE</i>	-0.036	0.010	0.010	0.011	0.064	0.047	0.192	-0.099	-0.036	-0.122				
12	<i>DELTA_SALE</i>	0.020	0.007	-0.007	0.027	-0.013	-0.030	0.050	-0.036	-0.183	-0.073	0.148			
13	<i>MB</i>	0.027	0.014	0.014	0.002	0.024	0.023	0.029	0.026	-0.030	0.047	-0.031	0.062		
14	<i>INST_OWNERSHIP</i>	-0.003	0.072	0.072	-0.046	0.310	0.187	0.361	0.117	-0.217	0.076	0.049	0.014	0.035	
15	<i>FIRM_AGE</i>	-0.087	0.084	0.084	-0.064	0.280	0.153	0.340	0.134	-0.266	0.091	0.023	-0.077	-0.021	0.214

This panel provides Pearson correlation coefficients for primary variables. The sample period is from 2003 to 2015. Variable definitions are provided in Appendix A. Bolded coefficients are significant at the 5 percent level.

Table 1.3 Effect of Common Directors on Corporate Boards of Aggressive EM Firms and Affected Firms on Earnings Management by Affected Firms

Panel A: OLS regressions, dependent variable is DA				
VARIABLES	(1)	(2)	(3)	(4)
D_CD	0.0280*** (0.003)			
D_CD1		0.0160*** (0.003)		
D_CD_MT1		0.0575*** (0.005)		
NUM_CD			0.0230*** (0.002)	
PERCENT_CD				0.1352*** (0.011)
LAG_ DA	0.0199*** (0.001)	0.0198*** (0.001)	0.0196*** (0.001)	0.0198*** (0.001)
BOARD_SIZE	-0.0011* (0.001)	-0.0011* (0.001)	-0.0009* (0.001)	0.0003 (0.001)
#LINK	0.0024*** (0.000)	0.0015*** (0.000)	0.0006 (0.000)	0.0014*** (0.000)
FIRM_SIZE	-0.0096*** (0.001)	-0.0094*** (0.001)	-0.0092*** (0.001)	-0.0094*** (0.001)
OCF	-0.0143** (0.007)	-0.0137** (0.007)	-0.0129** (0.007)	-0.0136** (0.007)
LOSS	-0.0133*** (0.003)	-0.0135*** (0.003)	-0.0135*** (0.003)	-0.0137*** (0.003)
ROA	0.0028 (0.002)	0.0027 (0.002)	0.0025 (0.002)	0.0026 (0.002)
LEVERAGE	-0.0035 (0.005)	-0.0041 (0.005)	-0.0040 (0.005)	-0.0033 (0.005)
DELTA_SALE	0.0079** (0.004)	0.0077** (0.004)	0.0073* (0.004)	0.0072* (0.004)
MB	0.0005*** (0.000)	0.0005*** (0.000)	0.0005*** (0.000)	0.0005*** (0.000)
INST_OWNERSHIP	-0.0229*** (0.006)	-0.0231*** (0.006)	-0.0241*** (0.006)	-0.0233*** (0.006)
FIRM_AGE	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0005*** (0.000)
Constant	0.3074*** (0.008)	0.3097*** (0.008)	0.3090*** (0.008)	0.2995*** (0.008)
Observations	47,379	47,379	47,379	47,379
Adjusted R-squared	0.199	0.200	0.202	0.201
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Firm Cluster	YES	YES	YES	YES

This panel presents the results of OLS regression of D_CD, NUM_CD, and PERCENT_CD based on equation (2) in section 3. Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1 percent level (two-tailed), respectively. The sample used in this table is firm-year observations. The dependent variable, |DA|, is calculated based on equation (1) in section 3. D_CD equals to one if any of the directors or senior executive officers holding a directorship in contagious firms, and 0 otherwise; D_CD1

(D_CD_MT1) is binary variable that takes the value of 1 when there is (are) one (multiple) directors working at contagious firms; NUM_CD is calculated as the number of directors or senior executive officers that hold a directorship in contagious firms; PERCENT_CD is the percentage of NUM_CD of the total number of directors on the board; Definitions of all other variables are provided in Appendix A.

Table 1.4 The Effect of Accounting and Finance Expertise on the Contagion Effect of Earnings Management

OLS regressions, dependent variable is DA			
VARIABLES	(1)	(2)	(3)
<i>D_CD</i>	0.0278*** (0.003)	0.0292*** (0.003)	0.0297*** (0.003)
<i>EXP_ACC</i>	0.0021 (0.002)	0.0018 (0.002)	
<i>D_CD*EXP_ACC</i>	0.0126** (0.006)	0.0135** (0.006)	
<i>EXP_FIN</i>	-0.0018 (0.002)		-0.0016 (0.002)
<i>D_CD*EXP_FIN</i>	0.0064 (0.005)		0.0076 (0.005)
<i>LAG_ DA </i>	0.0264*** (0.002)	0.0264*** (0.002)	0.0264*** (0.002)
<i>BOARD_SIZE</i>	-0.0009 (0.001)	-0.0009 (0.001)	-0.0010 (0.001)
<i>NUM_LINK</i>	0.0036*** (0.001)	0.0036*** (0.001)	0.0036*** (0.001)
<i>FIRM_SIZE</i>	-0.0077*** (0.001)	-0.0077*** (0.001)	-0.0077*** (0.001)
<i>OCF</i>	-0.0259** (0.011)	-0.0259** (0.011)	-0.0259** (0.011)
<i>LOSS</i>	-0.0123*** (0.004)	-0.0123*** (0.004)	-0.0122*** (0.004)
<i>ROA</i>	-0.0014 (0.005)	-0.0014 (0.005)	-0.0015 (0.005)
<i>LEVERAGE</i>	-0.0036 (0.007)	-0.0037 (0.007)	-0.0036 (0.007)
<i>DELTA_SALE</i>	0.0130** (0.006)	0.0130** (0.006)	0.0130** (0.006)
<i>MB</i>	0.0007*** (0.000)	0.0007*** (0.000)	0.0007*** (0.000)
<i>INST_OWNERSHIP</i>	-0.0191** (0.008)	-0.0191** (0.008)	-0.0190** (0.008)
<i>FIRM_AGE</i>	-0.0005*** (0.000)	-0.0005*** (0.000)	-0.0005*** (0.000)
Constant	0.2863*** (0.010)	0.2861*** (0.010)	0.2870*** (0.010)
Observations	262,649	262,649	262,649
Adjusted R-squared	0.214	0.214	0.214
Industry Fixed Effect	YES	YES	YES
Year Fixed Effect	YES	YES	YES

Firm-Year Cluster	YES	YES	YES
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This panel presents the results of OLS regressions that examine the effect of *EXP_ACC*, *EXP_FIN* on the contagion based on equation (3) in section 3. The sample in this table is based on firm-year-person observations. Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1percent level (two-tailed), respectively. The dependent variable, *|DA|*, is calculated based on equation (1) in section 3. *EXP_ACC* (*EXP_FIN*) equals to 1 if the director or senior executive officer is an accounting (finance) expertise, and 0 otherwise. The interaction term, *D_CD*EXP_ACC* (*D_CD*EXP_FIN*), gives us the incremental effect of accounting (finance) expertise on the earnings management contagion. Definitions of all other variables are provided in Appendix A.

Table 1.5 The Effect of High Institutional Shareholdings on the Contagion Effect of Earnings Management

VARIABLES	(1)	(2)
<i>D_CD</i>	0.0283*** (0.003)	
<i>INST_HIGH</i>	-0.0098* (0.006)	-0.0092* (0.005)
<i>D_CD*INST_HIGH</i>	-0.0027 (0.008)	
<i>NUM_CD</i>		0.0233*** (0.002)
<i>NUM_CD*INST_HIGH</i>		-0.0023 (0.004)
<i>LAG_DA/</i>	0.0199*** (0.001)	0.0196*** (0.001)
<i>BOARD_SIZE</i>	-0.0011** (0.001)	-0.0010* (0.001)
<i>NUM_LINK</i>	0.0025*** (0.000)	0.0007 (0.000)
<i>FIRM_SIZE</i>	-0.0101*** (0.001)	-0.0097*** (0.001)
<i>OCF</i>	-0.0143** (0.007)	-0.0129** (0.007)
<i>LOSS</i>	-0.0128*** (0.003)	-0.0130*** (0.003)
<i>ROA</i>	0.0029 (0.002)	0.0026 (0.002)
<i>LEVERAGE</i>	-0.0034 (0.005)	-0.0038 (0.005)
<i>DELTA_SALE</i>	0.0080** (0.004)	0.0073* (0.004)
<i>MB</i>	0.0005*** (0.000)	0.0005*** (0.000)
<i>FIRM_AGE</i>	-0.0006*** (0.000)	-0.0006*** (0.000)
Constant	0.3050*** (0.007)	0.3064*** (0.007)
Observations	47,379	47,379
Adjusted R-squared	0.198	0.202
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Firm Cluster	YES	YES

This panel presents the results of OLS regressions that examine the effect of institutional

holdings on the contagion based on equation (4) in section 3. The sample in this table is based on firm-year observations. Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1percent level (two-tailed), respectively. The dependent variable, $|DA|$, is calculated based on equation (1) in section 3. *INST_HIGH* is set to one when the total percentage of institutional shareholdings compared to the outstanding shares is greater than 70%, and 0 otherwise. The interaction term, $D_{CD} * INST_HIGH$ ($NUM_CD * INST_HIGH$), gives us the incremental effect of high institutional holdings on the earnings management contagion. Definitions of all other variables are provided in Appendix A.

Table 1.6 Robustness Tests for Earnings Management Incentives

Panel A: OLS regressions, dependent variable is DA			
VARIABLES	(1)	(2)	(3)
<i>D_CD</i>	0.0279*** (0.003)	0.0278*** (0.003)	0.0278*** (0.003)
<i>M&A</i>	0.0131*** (0.005)		0.0119*** (0.005)
<i>ISSUE</i>		0.0103*** (0.002)	0.0098*** (0.002)
<i>LAG_ DA </i>	0.0199*** (0.001)	0.0199*** (0.001)	0.0199*** (0.001)
<i>BOARD_SIZE</i>	-0.0011* (0.001)	-0.0011** (0.001)	-0.0011** (0.001)
<i>NUM_LINK</i>	0.0024*** (0.000)	0.0024*** (0.000)	0.0024*** (0.000)
<i>FIRM_SIZE</i>	-0.0098*** (0.001)	-0.0099*** (0.001)	-0.0100*** (0.001)
<i>OCF</i>	-0.0145** (0.007)	-0.0124* (0.007)	-0.0126* (0.007)
<i>LOSS</i>	-0.0132*** (0.003)	-0.0142*** (0.003)	-0.0141*** (0.003)
<i>ROA</i>	0.0029 (0.002)	0.0026 (0.002)	0.0026 (0.002)
<i>LEVERAGE</i>	-0.0048 (0.005)	-0.0072 (0.005)	-0.0082 (0.005)
<i>DELTA_SALE</i>	0.0065* (0.004)	0.0069* (0.004)	0.0057 (0.004)
<i>MB</i>	0.0005*** (0.000)	0.0005*** (0.000)	0.0005*** (0.000)
<i>INST_OWNERSHIP</i>	-0.0236*** (0.006)	-0.0234*** (0.006)	-0.0241*** (0.006)
<i>FIRM_AGE</i>	-0.0006*** (0.000)	-0.0005*** (0.000)	-0.0005*** (0.000)
Constant	0.3076*** (0.008)	0.3041*** (0.008)	0.3045*** (0.008)
Observations	47,379	47,379	47,379
Adjusted R-squared	0.199	0.199	0.199
Industry Fixed Effect	YES	YES	YES
Year Fixed Effect	YES	YES	YES
Firm Cluster	YES	YES	YES

In this table, two earnings management incentive variables are included, incidence of mergers and acquisitions (*M&A*), new issues (*ISSUE*) following (Chiu,

Teoh et al. 2012). Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1percent level, respectively. $M\&A = 1$ if the firm has a M&A event ($[AQS] > 0$) in year t , and 0 otherwise; $ISSUE = 1$ if the sum of new long-term debt $[DLTIS]$ and new equity $[SSTK]$ is greater than 2 percent of total assets, and 0 otherwise. Other control variables are defined in Appendix A.

Table 1.7 Robustness Test based on Alternative Proxy for Earnings Management		
Logistic regressions, dependent variable is <i>RESTATE</i>		
VARIABLES	(1)	(2)
<i>D_CD</i>	0.4985*** (0.126)	0.1703*** (0.056)
<i>EXP_ACC</i>		-16.0523 (0.1164)
<i>D_CD*EXP_ACC</i>		0.5019*** (0.127)
<i>BOARD_SIZE</i>	0.0766*** (0.019)	0.0759*** (0.019)
<i>NUM_LINK</i>	-0.0620*** (0.019)	-0.0618*** (0.019)
<i>FIRM_SIZE</i>	0.2187*** (0.029)	0.2192*** (0.029)
<i>OCF</i>	0.1896 (0.200)	0.1911 (0.201)
<i>LOSS</i>	0.3288** (0.128)	0.3325*** (0.128)
<i>ROA</i>	0.1504 (0.159)	0.1502 (0.159)
<i>LEVERAGE</i>	-0.0226 (0.152)	-0.0230 (0.152)
<i>DELTA_SALE</i>	-0.2519** (0.114)	-0.2515** (0.114)
<i>MB</i>	-0.0102 (0.007)	-0.0104 (0.007)
<i>FIRM_AGE</i>	0.0037 (0.004)	0.0036 (0.004)
<i>Constant</i>	-21.1320*** (0.473)	-21.2033*** (0.237)
Observations	25,802	155,775
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Cluster	Firm	Firm-Year
Pseudo R-squared	0.1674	0.1879

This table provides the results for robustness tests using alternative earning management proxy, *RESTATE*. The dependent variable, *RESTATE*, equals to one if the firm restates the financial report, and zero otherwise. Column (1) uses firm-year observations to test the contagion effect. Column (2) uses firm-year-person observations to examine the effect of individual's accounting expertise. The Definitions of all variables are provided in Appendix A. Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1percent level (two-tailed), respectively.

Table 1.8 Endogeneity Issue with the Effect of Common Directors on Spillover Effect of Earnings Management

Panel A: Likelihood of Common Director on Affected Firms	
VARIABLES	(1) DA
<i>MKV</i>	0.0000*** (0.000)
<i>FIRM_SIZE</i>	0.2870*** (0.016)
<i>LEVERAGE</i>	-0.2794*** (0.086)
<i>LOSS</i>	0.501*** (0.048)
<i>PATENT</i>	0.0002** (0.000)
<i>CITATION</i>	-0.0000 (0.000)
<i>R&D</i>	0.0002 (0.000)
<i>SEGMENT</i>	0.0019 (0.003)
<i>Constant</i>	-2.6894*** (0.114)
Observations	18,808
Adjusted R-squared	0.165
Industry Fixed Effect	YES
Year Fixed Effect	YES
Firm Cluster	YES

Panel B: Association of Earnings Management with Predicted Value of Common Director on Affected Firms

VARIABLES	DA
<i>P_LINKED</i>	0.2782*** (0.046)
<i>LAG_ DA </i>	0.0225*** (0.002)
<i>BOARD_SIZE</i>	-0.0004 (0.001)

<i>NUM_LINK</i>	0.0047*** (0.001)
<i>FIRM_SIZE</i>	-0.0298*** (0.003)
<i>OCF</i>	-0.0270** (0.011)
<i>LOSS</i>	-0.0307*** (0.006)
<i>ROA</i>	0.0090** (0.003)
<i>LEVERAGE</i>	0.0101 (0.008)
<i>DELTA_SALE</i>	0.0225*** (0.007)
<i>MB</i>	0.0007*** (0.000)
<i>INST_OWNERSHIP</i>	0.0416*** (0.007)
<i>FIRM_AGE</i>	-0.0009*** (0.000)
<i>Constant</i>	0.2489*** (0.011)
Observations	17,843
Adjusted R-squared	0.191
Industry Fixed Effect	YES
Year Fixed Effect	YES
Firm Cluster	YES

Panel A displays logit estimation for the likelihood of being linked to a contagious company through board of directors. The dependent variable, *LINK_CONTAGIOUS*, equals to 1 if the company has a common director with contagious firm. Due to the data availability of *SEGMENT*, the number of the segments, this analysis is performed on 18,808 firm-year observations from 2010 to 2015. *CITATION*, and *PATENT*, are the number of citations and patents obtained from NBER.

Panel B repeats the analysis of discretionary accruals from Table 3 while including an additional control for the likelihood of the company is linked to another firm through board of directors. This model is an OLS model where the dependent variable, *|DA|*, is the absolute value of discretionary accruals. The probability of linked to another company, *P_LINKED*, is the fitted value from the model in Panel A. Definitions of all other variables are provided in Appendix A. Robust standard errors are presented in parentheses. ***, **, * stands for significance at the 10 percent, 5 percent, and 1percent level (two-tailed), respectively.

ESSAY 2: Contagion Effect of SEC Comment Letters on Firms with Interconnected Auditor Office

1. Introduction

The Sarbanes-Oxley Act of 2002 requires the Securities and Exchange Commission (SEC) to review each reporting firm at least once every three years. During the review process, the SEC evaluates firm disclosure from a potential investor's perspective and asks questions that an investor might have when reading the document. Comment letters will be sent to firms for further explanation, clarification, or revision of the filings if the SEC staff has identified conflicts with SEC rules, incompliance with the applicable accounting standards, or inadequacy of clarity or detail in the disclosures. In this paper, we examine the contagion effect of receiving the SEC comment letters among companies within the same auditor office and how auditor office learns from the letters.

While the SEC has not publicly disclosed the specific criteria it uses to select filings for review¹, understanding which firms are more likely to be examined by the SEC is imperative because resolving comment letters may divert substantial resources away from normal operations and may have damaging ramifications. First, firms need to spend time and efforts addressing the issues raised in the comment letters². The process requires significant efforts of the responsible person, usually the CFO, to respond to each comment and revise the disclosures if necessary. Further, issues not addressed satisfactorily in the review process may lead to subsequent restatement, amendment, or other enforcement

¹ Section 408 of the Sarbanes-Oxley Act states that the SEC shall consider factors such as restatement, volatility, and market capitalization in the review process.

² The average time between the initial comment letter and the "no further comment" letter is 80 days (Cassell, Dreher et al. 2013).

actions³. Moreover, the release of comment letters may negatively influence firm's stock price and could lead to insider sales⁴. Therefore, understanding the determinants of receiving comment letters is essential to both companies and investors.

While previous studies on comment letters are the building blocks of our understanding of the SEC's selection criteria, they tend to focus on firm characteristics rather than the potential network contagion effect, i.e. the receipt of comment letters could spill over from one firm to others⁵. This study is an attempt to demonstrate that auditor, an important participant in the financial market, is used by the SEC in the review process as a contagion channel. Since auditors help firms prepare financial statements and provide reasonable assurance that the financial statements are not materially misstated, filings of firms sharing the same auditor may have high degree of reporting similarities. Specifically, we aim to address two research questions: are firms more likely to receive comment letters if another industry peer firm sharing the same auditor office was commented by the SEC? Do auditor offices subsequently learn from the review process and help clients resolve comment letters more efficiently?

Results in this paper reveal that firms are more likely to receive 10-K comment letters⁶ from the SEC after one of their industry peers, audited by the same auditor office,

³ About half of the SEC enforcements come from the review process (Feroz, Park et al. 1991). For example, companies that response to the SEC with less readable letters are associated with a higher likelihood of subsequent restatement and amendment (Cassell, Cunningham et al. 2017).

⁴ Small negative return is documented around the comment letter release date. (Dechow, Lawrence et al. 2016).

⁵ Previous literature has identified several factors associated with the likelihood of receiving comment letters, including corporate governance quality, reliance on external financing (Ettredge, Johnstone et al. 2011), profitability, complexity, type of auditors (Cassell, Dreher et al. 2013), CEO compensation and media attention (Robinson, Xue et al. 2011), political connection (Heese, Khan et al. 2017), and tax avoidance (Kubick, Lynch et al. 2016).

⁶ According to SOX (2002), SEC should review disclosures made by issuers reporting under section 13(a) of the Securities Exchange Act of 1934 (including reports filed on Form 10-K). Audit Analytics database

receives the same type of comment letters. Moreover, such contagion effect only exists in firms with identified accounting issues, suggesting that the spillover occurs through auditor offices only when the issues fall into auditors' responsibilities. In addition, the contagion effect is much smaller among firms with larger auditor offices, demonstrating that greater human capital and better in-house expertise of auditor office can attenuate the effect. Finally, the number of topics identified by the SEC and the number of rounds needed to resolve comment letters are smaller for the client firms whose auditor offices have helped the same-industry clients resolve comment letters in the past two years, implying that auditor officers are also developing expertise in the process.

This study contributes to four streams of research. First, we contribute to the SEC comment letter literature by identifying a factor associated with the probability of receiving 10-K comment letters that is not examined in prior literature. We document that in addition to previously identified firm and industry characteristics that impact the likelihood of receiving comment letters (Cassell, Dreher et al. 2013, Ettredge, Huang et al. 2012, Robinson, Xue et al. 2011, Kubick, Lynch et al. 2016, Heese, Khan et al. 2017), there could be spillover effect from industry peers and office-level auditors. From a practical point of view, our finding suggests that firms and investors should pay attention to the engagements performed by their auditor offices for other clients to identify if they are likely to be commented by the SEC.

assigns each comment letter to specific filings, for example, 10-K, 8-K, 10-Q, DEF 14A. In this study, we only refer to comment letters related to 10-K, the filings that require considerably greater auditor involvement and participation. More details of the reason that we are only interest in 10-K comment letters will be presented in 3.1.

Second, this study also sheds light on the recent auditing literature that examines the contagion effect of low-quality audits. Francis and Michas (2013) provide evidence that the presence of an audit failure in an office-year, measured by clients' downward-earnings restatement, indicates a systematic problem of the audit office that could both laterally spillover to other concurrent audits, and be longitudinal self-contagious up to five years. Li et al. (2017) further underscore the importance of individual auditor by showing that the office level low-quality audits contagion is driven by individual auditors. We add to this literature by showing that the contagion effect of low-quality audits has broader implications than earnings recognition issue documented by Francis and Michas (2013) and Li et al. (2017). As SEC comment letters can capture issues that are not as severe as a downward-earnings restatement, our results suggest that low-quality audits can be contagious on a broader set of issues.

Third, our study adds to the literature that examines the consequences of the public enforcement, comment letters in particular. Direct effects on commented firms are documented by a recent stream of research (Kubick, Lynch et al. 2016, Johnston, Petacchi 2017, Gietzmann, Marra et al. 2016, Bens, Cheng et al. 2016). We extend this literature by examining how SEC comment letters affect a broader scope of companies, including non-commented companies, through the engagement of auditors in the process of resolving comment letters. This evidence supports the effectiveness and deterrence benefit of SEC's review process. The comment letters not only help to monitor and enhance compliance with the applicable disclosure and accounting requirements for commented firms but also increase the reporting quality for non-commented firms through the engagement and involvement of auditors.

Lastly, this study complements behavioral research that examine the effect of audit experience on auditors' judgment. Unlike prior studies that design specific audit tasks or use specific cases to isolate the learning effect, this paper utilizes an archival setting to illustrate that auditor learning effect exists in actual engagements.

The remainder of the paper is organized as follows. In Section 2, we review relevant literature and develop hypotheses. Section 3 describes the sample selection procedure and empirical research design. Section 4 presents the results for our analyses and robustness tests. Section 5 concludes this paper.

2. Background and Hypotheses Development

2.1 SEC's 10-K Review Process

Section 408 of the Sarbanes Oxley-Act (2002) requires the SEC to review issuers' disclosures, including financial statements, no less frequently than once every three years. The review process is conducted by the Division of Corporation Finance through 11 offices staffed with approximately 80 percent of the Division's employees. Each office is responsible for reviewing filings of firms in a certain industry. Although the SEC intends to review all firms annually, the average time from reviewing the filings to issuing the initial comments is 26 days (SEC 2016), indicating that SEC employees have difficulty reviewing all registrants' filings within 365 calendar days. Due to resource limitation, less than 20 percent of filers have been reviewed by the SEC each year prior to SOX. The percentage is increasing by year and has reached 51 in 2015 (SEC 2016), suggesting that the SEC is improving its efficiency of review but still about half of firms would be ignored each year. Therefore, this study explores how the SEC constructs selection criteria in the

review process to reach the goal that deters undesirable behavior as efficiently as possible (Shavell 2004).

2.2 The Determinants and Consequences of Comment Letter

Although the Division of Corporation Finance has never publicly disclosed the specific criteria of selecting filings in the review process, recent research examines what firm characteristics are associated with the probability of receiving comment letters. Firms with weak corporate governance, low profitability, high complexity, engaging small audit firms, and that rely less on external financing are more likely to be reviewed (Cassell, Dreher et al. 2013, Ettredge, Johnstone et al. 2011). Robinson et al. (2011) find that the number of SEC comments is positively associated with excess CEO compensation and negative media attention. Two more recent papers show that political connection (Heese, Khan et al. 2017) and tax avoidance (Kubick, Lynch et al. 2016) also increase the likelihood of receiving comment letters.

Another stream of study examines the consequences of receiving SEC comment letters. Johnston and Petacchi (2017) demonstrate that the bid-ask spread declines and Earnings Response Coefficients (ERCs) increase in the subsequent years of comment letters. CFOs are more likely to be replaced after the issuance of comment letters, especially when the accumulation of comment letters through time increases and when the comment letters are more severe (Gietzmann, Marra et al. 2016). Two recent studies focus on the contagion effect of SEC comment letters. Particularly, firms that receive tax-related SEC comment letters subsequently decrease their tax avoidance behaviors to a greater extent than firms not receiving tax comment letters. Additionally, the downward tax avoidance behaviors spill over to other industry peers not receiving comment letters (Kubick, Lynch

et al. 2016). Brown et al. (2017) also document the contagion effect of comment letters on firms' risk factor disclosure by showing that no-letter firms modify their risk factor disclosures after the SEC commented on the risk factor disclosure on the industry leader or numerous industry peers.

Overall, although the extant comment letters literature has investigated the spillover effect of the comment letter consequence, less is known about whether there is also spillover effect in the determinants of receiving comment letters as most studies treat firms individually when studying the determinant factors. Different from prior studies, this paper incorporates recent findings that demonstrate the contagion effect of reporting behavior, and documents how other firms' comment letter issue would affect their industry peers through interconnected auditor office.

2.3 The Contagion Effect of Low-Quality Audits

Early studies have established that Big 4 auditors have higher audit quality than non-Big 4 audit firms (Lennox 1999, DeFond, Zhang 2014). At a more disaggregated level, there are also considerable variations of audit quality among city-level auditor offices within the same audit firm based on office-level characteristics, such as in-house expertise (Krishnan 2005, Choi, Kim et al. 2010, Francis, Michas 2013), quality control procedures (Francis, Yu 2009), and client concentration (Reynolds, Francis 2000). Two recent studies show that low-quality audits spill over to the clients through auditor office, and that the effect is larger for smaller auditor office (Francis, Michas 2013, Li, Qi et al. 2017). Our study extends this stream of research by showing how auditor office is exploited by the SEC in the comment letter review process and how audit office-level characteristics,

specifically the audit office size, affect the contagion effect in the SEC's selection procedures.

2.4 Hypotheses Development

The objective of the SEC's review process is to improve the quality of disclosures in terms of sufficiency, clarity, and reasonableness. Reasons that a company may receive 10-K comment letters could be either confliction with SEC rules and the applicable accounting standards, or material deficiency and lack of explanations in the disclosure (Appendix D presents an example of a 10-K comment letter). External auditors have "responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by an error of fraud" (SAS No.1 2003).

Since the quality of financial reporting at least partially depends on the audit quality (Lennox, Wu et al. 2014, DeFond, Zhang 2014), issues related to financial reporting quality may reveal systematical deficiencies concerning the work performed by the auditor officer, which could be indicative of problems in 10-Ks that are audited by the same office. For example, audit quality could be affected by auditor's cognitive style, risk profile, capability, audit experience, independence, educational background, and other person-level characteristics, all of which could spill over to other engagements performed by the same auditor office (Nelson 2009, Nelson, Tan 2005, Gul, Wu et al. 2013). Consistent with this view, Francis et al. (2013) and Li et al. (2017) document that the quality of audited earnings is lower for clients in the low-quality audit office compared to a control sample of office-years with no restatements, suggesting that the low-quality audit spills over through auditor

office and that the reporting unclarity/conflicts for one client may provide useful information about the quality of concurrent audits performed in the same office.

Because the SEC intends to detect undesirable reporting behaviors of all registrants but cannot examine filings of all firms in a particular year due to resource limitation, the division must develop efficient selection criteria to identify potential target firms as efficiently as possible. Under the assumption that the SEC recognizes that audit office is a strong channel for the spillover of reporting behaviors, SEC staffs may mark and further check a firm's industry peers that are audited by the same auditor office in the subsequent year after they find irregularity or deficiency in 10-K filings of this firm. Particularly, the contagion effect would be more observable in firms in the same industry because the comment letter review process is conducted by eleven offices, each of which only focuses on a specific industry⁷.

In addition, in an auditor office, especially large auditor office, clients from a specific industry are more likely to be audited by the same auditor group to maximize the benefits of industry expertise (Craswell, Francis et al. 1995), increasing the likelihood that these firms display similar reporting behaviors by sharing the same individual auditors. Therefore, we expect that after one client firm in a specific industry receives a 10-K comment letter, the SEC is more likely to select other clients that operate in the same industry and are audited by the same auditor office for review.

⁷ We do not find any anecdotal evidence that those offices in the Division of Corporation Finance cooperate in their review process. Thus, we assume that the 10-K comment letter contagion effect on client firms works only within industry.

H1a: *The presence of 10-K comment letter for one client is positively associated with the likelihood of subsequent 10-K comment letters for other clients in the same industry audited by the same auditor office.*

The contagion effect through shared auditor office may vary based on the issues identified in the comment letters. A recent study using content analysis shows that approximately half of the comments involve financial reporting, accounting application issues (Johnston, Petacchi 2017). Some idiosyncratic issues, including MD&A, risk factors, and internal control disclosure, are more firm specific and are less applicable to other firms. By contrast, accounting-related issues such as application of accounting rules may be more contagious because they involve a greater extent of auditor's judgment and thus are more likely to be systematically influenced by auditors' characteristics. Therefore, we further separate 10-K comment letters into accounting-related and non-accounting comment letters and predict that the contagion effect is stronger for accounting-related comment letters.

H1b: *The CL contagion effect is stronger for accounting-related comment letters.*

The next hypothesis concentrates on the mitigation channel of the contagion effect. DeAngelo (1981) shows that auditors in large audit firms are more motivated to provide high-quality services because they have more to lose when audit failure occurs (deep pocket). Specifically, auditors from better quality-control procedure audit firms are more likely to lose after audit incidents (Aobdia, Petacchi 2017). Besides, larger Big 4 offices have more collective experience in conducting audits of public companies and better quality-control procedures that are otherwise not available for smaller offices. Therefore, larger Big 4 offices exhibit higher reporting quality compared to smaller offices (Francis,

Yu 2009, Choi, Kim et al. 2010, Francis, Michas 2013). We thus predict that auditor office size could moderate the adverse contagion effect of comment letters.

H2: The 10-K comment letter contagion effect is smaller through large Big 4 auditor offices.

The last hypothesis examines the learning effect of the auditor offices, i.e. how audit experience helps in resolving comment letter. The SEC suggests that registrants could work with their auditors to response, resolve, and close comment letter files (SEC, 2014). In practice, auditor firms, especially the Big 4, extensively engage in the process of addressing comment letters and have summarized findings from their experience (KPMG 2017, Deloitte 2016, PwC 2016, EY 2016). For example, a recent report by Deloitte (2016) discussed the latest SEC's strategic priorities, summarized the top 10 topics identified by the SEC, presented their analysis of staff comments, and revealed the time span to close the comments in their practices.

Prior audit experience literature suggest that audit experience is associated with higher audit quality (Cahan, Sun 2015, Waller, Felix 1984, Abdolmohammadi, Wright 1987). Therefore, individual auditor offices, learning from their experience addressing comment letters, could perform better when audit and resolve comment letters in subsequent years. First, the process of helping clients address comment letters enables auditor offices to understand what issues are likely to be targeted by the SEC. Accordingly, their subsequent audit procedures for other clients may be shaped by the comment letters, resulting in a reduction in the number of topics identified by the SEC if these client firms receive SEC comment letters. Second, auditor offices that have dealt with comment letters for a specific industry client in the past two years are more familiar with the review process

and become more capable of responding to comment letters efficiently and accurately. Since more readable responses are associated with shorter response times from SEC, lower likelihood of receiving follow up comments, fewer rounds of comments, and lower probability of restatement or amendment stemming from the review process (Cassell, Cunningham et al. 2017), we expect that client firms of an auditor office whose client in the same industry was previously reviewed by the SEC will have lower remediation costs (i.e., fewer number of topics and shorter rounds).

H3: If the auditor office has the experience to resolve 10-K accounting-related comment letters for a specific industry during past two years, the remediation costs to resolve comment letters for the client firms will be lower in the subsequent years.

3. Sample, Research Design and Descriptive Statistics

3.1 Sample

We use Audit Analytics database to collect SEC comment letters from the year 2005 through 2015. The sample begins at 2005 because the SEC began to release the comment letters publicly (SEC 2004). The sample period ends in 2015 because the financial data may be incomplete for fiscal years after 2015. Since our focus is on the 10-K comment letters, we exclude comment letters that are not referred to 10-K filings and identify 7,451 initial 10-K comment letters⁸.

We obtain auditor and company characteristics data from Audit Analytics, CRSP, Compustat, ExecuComp, and Thomson Reuters. Table 2.1 represents the sample selection

⁸ Each comment letter is assigned with a unique Conversation ID by Audit Analytics. We aggregate the comment letter observations in Audit Analytics by the Conversation ID.

process. In particular, we exclude the firms that are not audited by Big 4 or Tier 2⁹ audit firms. This is because in auditor offices other than Big4 and Tier 2, the number of clients in each industry is not enough for spillover effect. The final sample consists of 26,715 firm-year observations, among which 5,972 firm-year observations receive accounting-related 10-K comment letters.

[-Insert Table 2.1 here-]

In this study, we exclusively focus on 10-K comment letters for following reasons. First, although external auditors will review firm filings other than 10-K such as quarterly report, they are only legally responsible for firm's annual reports. As 10-K filings are more complex and require auditor's professional judgment, interpretation, and implementation of accounting standards to a greater extent (Cassell, Dreher et al. 2013), it is most appropriate for the examinations of contagion effect through auditor offices. Second, since prior literature provides evidence that investors consider 10-Ks to be the most informative filings because they provide detailed information about firm performance and financial conditions (Griffin 2003), examining 10-K comment letters is thus of more interest to investors and has more significant implications.

3.2 Research Design

The primary regression model to examine the relation between auditor office and the incidence of receiving a comment letter is the following, where the subscript i represents the firm and t represents the year:

⁹The second-tier audit firms are BDO Seidman, Crowe Horwath, Grant Thornton, or McGladrey & Pullen.

$$\begin{aligned}
& \text{CommentLetter}_{it} \\
& = \beta_0 + \beta_1 \text{AuditorAffected}_{it} + \beta_2 \text{M_Weak}_{it} + \beta_3 \text{Restate}_{it} \\
& + \beta_4 \text{HighVolatility}_{it} + \beta_5 \text{LnMarketCap}_{it} + \beta_6 \text{FirmAge}_{it} + \beta_7 \text{Loss}_{it} \\
& + \beta_8 \text{Bankruptcy}_{it} + \beta_9 \text{SalesGrowth}_{it} + \beta_{10} \text{M\&A}_{it} + \beta_{11} \text{Restructuring}_{it} \\
& + \beta_{12} \text{ExtFinancing}_{it} + \beta_{13} \text{Large}_{it} + \beta_{14} \text{Litigation}_{it} + \beta_{15} \text{Big4}_{it} + \beta_{16} \text{AudTenure}_{it} \\
& + \beta_{17} \text{AuditorResign}_{it} + \beta_{18} \text{AuditorDismiss}_{it} + \beta_{19} \text{NumClients}_{it} + \beta_{20} \text{CEO_Chair}_{it} \\
& + \beta_{21} \text{CFO_Tenure}_{it} + \beta_{22} \text{CEO_Tenure}_{it} + \beta_{23} \text{Clean_Past2}_{it} + \beta_{24-26} \text{GovMissing}_{it} \\
& + \text{Industry Fixed Effects} + \text{Year Fixed Effects} \quad (1)
\end{aligned}$$

CommentLetter is an indicator equals to one if the firm received a comment letter related to its 10-K filings for the fiscal year, and zero otherwise. We estimate Model (1) using logistic regression estimation.

Following prior literature (Francis, Michas 2013, Li, Qi et al. 2017), we identify auditor office by using the city, state, region, and name of the auditor in Audit Analytics database. *AuditorAffected* equals to one if the company is audit by the audit office whose other client firms in the same industry received a comment letter in the previous year, zero otherwise. Therefore, the coefficient on *AuditorAffected* will capture the comment letter contagion effect through audit office.

We rerun Model (1) by substituting *AuditorAffected* with *AuditorAffected_Acctg* and *AuditorAffected_NonAcctg* to investigate which types of comment topics are more contagious. Specifically, *AuditorAffected_Acctg* (*AuditorAffected_NonAcctg*) is set to one if any of the industry peers audited by the same office receive a comment letter in previous year addressing (non-) accounting issues, and zero otherwise. Audit Analytics classifies

each comment letter as: (1) Accounting Rule and Disclosure Issue; (2) Internal Control Disclosure Issues; (3) MD&A; (4) Regulatory Filing Issues; (5) Risk Factors; or (6) Other, such as compensation, non-GAAP, legal matters. Following Cassel et al. (2013), we categorize Accounting Rule and Disclosure Issue comments as accounting issues, and topics in Internal Control Disclosure Issues, MD&A, Regulatory Filing Issues, Risk Factors, and Other as non-accounting comments.

To examine whether auditor office size affects the extent to which receiving a comment letter is indicative of a contagion effect (H2), we dichotomize office size (the natural log of the total dollar amount of audit fees charged to all clients within an auditor office in year t) and interact *LargeOffice* with *AuditorAffected* in Model (1). Specifically, *LargeOffice* equals to one if the auditor office is larger than the 75th percentile value of office size, and zero otherwise.

The control variable in the regression are mainly motivated by SOX Section 408 and Cassel et al. (2013) that examine the probability of receiving comment letters. According to SOX Section 408, paragraph (b), the SEC should consider the following factors when identifying firms in its review process: “ (1) issuers that have issued material restatements of financial results; (2) issuers that experience significant volatility in their stock price as compared to other issuers; (3) issuers with the largest market capitalization; (4) issuers whose operations significantly affect any material sector of the economy; and (5) any other factors that the Commission may consider relevant.”

With respect to factor (1), we include proxies for internal control quality (*M_Weak*) and previous failures in financial reporting (*Restate*). We set *M_Weak* (*Restate*) equals to 1 if the company reported a material weakness (restatement) in years t , $t-1$, or $t-2$, and 0

otherwise. We proxy for factor (2) by identifying issuers with high volatility in their stock price, and set variable *HighVolatility* equals to 1 if the firm is in the highest quartile of the distribution of volatility of abnormal stock returns. For factor (3) and (4), we include firm size (*LnMarketCap*) in the models. Factors (5) allows discretion to the SEC in deciding firm characteristics that may indicate whether more or less firm scrutiny is warranted, and therefore we include a number of additional proxies that might affect SEC scrutiny.

We also include the control variables for other company characteristics (Edward I. Altman 1968, Brazel, Jones et al. 2009, Dechow, Sloan et al. 1996, Ettredge, Johnstone et al. 2011, Francis, Philbrick et al. 1994), auditor characteristics (DeFond 1992, Palmrose 1988, Geiger, Raghunandan 2002, Johnson, Khurana et al. 2002), and governance characteristics (Cassell, Dreher et al. 2013) that might affect the reporting quality. The definitions of each control variable are listed in Appendix C. Moreover, the number of clients in each office (*NumClients*) and whether the company was commented by the SEC in the past two years (*Clean_Past2*) are included in the model to further control the scenarios: (1) firms audited by larger audit office are exposure to more industry peers in the same office and thus are more likely to be affected; (2) firms that were reviewed and commented by the SEC in previous years may have systematic problems that could be flagged and paid extra attention to by the SEC; (3) companies that were not reviewed by the SEC in past two years are more likely to receive comment letters since the SEC is required to review each filers' disclosure at least once in every three years.

3.3 Descriptive Statistics

Table 2.2 reports descriptive statistics for the variables described above. Panel A presents statistics for the complete pooled sample. Panel B and C reports the distribution

of comment letters by year and by region. Panel A of Table 2.2 shows that in the full sample, 45 percent of firms are audit by the audit office whose client firm in the same industry received a comment letter in previous year (*AuditorAffected* =1). Panel B summarizes the comment letter statistics by year. The number (percentage) of companies that receive comment letters increases over year and peaks during the 2008 financial crisis period. After 2008, the number (percentage) starts to drop. In our sample, 76 percent of 10-K comment letters contain topics in accounting issues. Moreover, the number of comments and rounds for individual comment letters display the same pattern as the number of comment letters, i.e. increase before the financial crisis and decrease afterwards. Panel C presents the frequency of comment letters by year and by region and shows that within each region, the proportion of firms commented by the SEC over the sample period is similar. It indicates that the SEC do not have geography preference in the review process over different years.

Untabulated Pearson correlations show the correlations among the independent variables are all below 0.50, indicating that multicollinearity is not likely to be of concern.

[-Insert Table 2.2 here-]

4. Results Analysis

4.1 The Contagion Effect of Comment Letters in Auditor Office

The results in Table 2.3 provide evidence that the contagion of comment letters exists in auditor offices. Table 2.3, Panel A presents the first set of regression results testing H1 where the dependent variable is *CommentLetter*. In column (1), we include the test variable, *AuditorAffected*, and all control variables other than the governance variables,

which are available for only a subset of our sample. The internal governance variables are included in column (2), along with a set of dummy variables, *GovMissing*, which equal to one when the respective governance variable is missing (Cassell, Dreher et al. 2013). The p-values on the test variable (*AuditorAffected*) are reported conservatively as two-tailed values, though predictions are being made with respect to contagion effect. The positive and significant ($p < 0.001$, two-tailed) coefficients on *AuditorAffected* in both columns indicate that clients audited by the auditor offices with at least one commented client firm from the same industry in previous year have higher likelihood to receive comment letters, compared to auditor offices where no comment letters were sent to any of the clients in a certain industry. The results are also economically significant with odds ratio at 1.35. We also notice that the clients of *Big4* auditors are less likely to receive a 10-K comment letter than are clients of Tier two auditors ($p < 0.01$). Other control variables are consistent with previous comment letter literature (Cassell, Dreher et al. 2013, Dechow, Lawrence et al. 2016).

Table 2.3, Panel B analyzes whether the contagion effect differentiates in types of comment letters. In both two columns, the coefficient of *AuditorAffected_Acctg* is significant, whereas that of *AuditorAffected_NonAcctg* is insignificant. The results support the hypothesis that comment letters addressing accounting issues are more contagious.

[-Insert Table 2.3 here-]

4.2 Contagion Effect for Larger versus Smaller Offices

Motivated by the findings that larger Big 4 offices conduct higher-quality audits, Table 2.4 investigates whether the contagion effect in auditor office is conditioned by the size of the office (H2). While H2 specifically focuses on Big 4 auditors, for completeness, we also provide evidence of large and small Tier 2 offices in separate regressions. The test variable *AuditorAffected*, by itself, determines if a contagion effect exists in the smallest 75 percent of auditor offices. The coefficient of interaction term, *AuditorAffected* * *LargeOffice*, show the incremental difference for the largest quartile of offices relative to the smallest 75 percent. The coefficients on *AuditorAffected* are positive and significant for both auditor groups, and the coefficients on the interaction term are significantly negative for Big 4 offices. This means larger Big 4 offices could moderate the comment letter contagion effect. In contrast, consistently with prior literature, such bright side of office size is not observed in the Tier 2 firms. The F-test of the sum of the coefficients (*AuditorAffected* + *LargeOffice*) is significantly different from zero. We conclude that the office size of Big 4 auditors appears to attenuate contagion effects.

[-Insert Table 2.4 here-]

4.3 The Effect of Auditor Office's Experience

Model (2) and (3) use ordinary least square regressions to test H3, i.e. whether the auditor office's experience in dealing with comment letter lowers the cost of resolving comment letters for future clients. In Model (2), the dependent variable (*NumTopics*) is the total number of comment topics, coded by Audit Analytics database, in the initial comment

letter from the SEC. Additional control variable, the number of filings referred to in the comment letter (*NumFilings*), is included in Model (2). This is because a comment letter may address comments more than one filing, the number of filings could affect the number of comment topics. In Model (3), the dependent variable is the number of letters from SEC (*NumRounds*), representing the number of rounds from the initial letter to the closing letter with “no further comment”. We control for *NumFilings* and *NumTopics* in Model (3) because both the number of filings referred and the number of topics addressed could affect the rounds to resolve.

$$NumTopics_{it}$$

$$\begin{aligned}
&= \beta_0 + \beta_1 AuditorExp_Past2_{it-1} + \beta_2 M_Weak_{it} + \beta_3 Restate_{it} \\
&+ \beta_4 HighVolatility_{it} + \beta_5 LnMarketCap_{it} + \beta_6 FirmAge_{it} + \beta_7 Loss_{it} \\
&+ \beta_8 Bankruptcy_{it} + \beta_9 SalesGrowth_{it} + \beta_{10} M\&A_{it} + \beta_{11} Restructuring_{it} \\
&+ \beta_{12} ExtFinancing_{it} + \beta_{13} Large_{it} + \beta_{14} Litigation_{it} + \beta_{15} Big4_{it} + \beta_{16} AudTenure_{it} \\
&+ \beta_{17} AuditorResign_{it} + \beta_{18} AuditorDismiss_{it} + \beta_{19} NumClients_{it} + \beta_{20} CEO_Chair_{it} \\
&+ \beta_{21} CFO_Tenure_{it} + \beta_{22} CEO_Tenure_{it} + \beta_{23} Clean_Past2_{it} + \beta_{24} NumFilings_{it} \\
&+ \beta_{25-27} GovMissing_{it} + Industry\ Fixed\ Effects + Year\ Fixed\ Effects \quad (2)
\end{aligned}$$

$$NumRounds_{it}$$

$$\begin{aligned}
&= \beta_0 + \beta_1 AuditorExp_Past2_{it-1} + \beta_2 M_Weak_{it} + \beta_3 Restate_{it} \\
&+ \beta_4 HighVolatility_{it} + \beta_5 LnMarketCap_{it} + \beta_6 FirmAge_{it} + \beta_7 Loss_{it} \\
&+ \beta_8 Bankruptcy_{it} + \beta_9 SalesGrowth_{it} + \beta_{10} M\&A_{it} + \beta_{11} Restructuring_{it} \\
&+ \beta_{12} ExtFinancing_{it} + \beta_{13} Large_{it} + \beta_{14} Litigation_{it} + \beta_{15} Big4_{it} + \beta_{16} AudTenure_{it} \\
&+ \beta_{17} AuditorResign_{it} + \beta_{18} AuditorDismiss_{it} + \beta_{19} NumClients_{it} + \beta_{20} CEO_Chair_{it}
\end{aligned}$$

$$\begin{aligned}
& +\beta_{21}CFO_Tenure_{it}+\beta_{22}CEO_Tenure_{it}+\beta_{23}Clean_Past2_{it}+\beta_{24}NumFilings_{it} \\
& +\beta_{25}NumTopics_{it}+\beta_{26-28}GovMissing_{it} + Industry Fixed Effects \\
& + Year Fixed Effects \quad (3)
\end{aligned}$$

In Table 2.5, we report the results from estimating Model (2) and (3) to test whether the auditor offices' experience in resolving comment letters helps their clients (H3). *NumTopics* and *Rounds* is the remediation cost proxy for Panel A and Panel B, respectively. The samples are restricted to company-year observations that receive an accounting-related comment letters. In Panel A, the coefficients on *AuditorExp_Past2* for both column (1) and (2) are significantly negative (p-value<0.01), indicating that the client companies are commented by the SEC with fewer issues if the auditor office experienced resolving comment letters for the same industry clients in the previous two years. In Panel B, the coefficients on *AuditorExp_Past2* are also negative and significant (p<0.1). The results suggest that the rounds of conversations between the SEC and companies are shorter when the companies' auditor office have comment letter experience. Collectively, the results in Table 2.5 indicate that auditor office's experience in comment letters for a certain industry lowers the remediation costs of resolving SEC comment letters for client firms in the same industry.

[-Insert Table 2.5 here-]

4.4 Robustness Test

Many non-Big 4 auditor firms only have a few office locations. To further control the possibility that these very small audit firms drive the results, we delete all observations

where a company is audited by an audit firm that has less than two (four, or ten) offices. All results are similar using the reduced sample.

It is also possible that auditor offices with few clients are driving the results. To address this concern, we delete all companies audit by an office whether the total number of clients in a year is less than two (four). Untabulated results are still similar.

Following Francis and Michas (2013), we also investigate whether one of more specific Big 4 auditor firms systematically drives the results. We rerun all the regressions on separate samples for each Big 4 auditor. The auditor-specific regressions are similar to the pooled results. We conclude that there is no systematic difference in the contagion effect among the Big 4 firms.

The geographic concern of our study could be that the SEC may focus on companies in a certain area in each year. If this review preference exists, our results may be driven. However, the distribution of comment letters by year and by region in Table 2.2, Panel C, excludes this possibility. Specifically, the distribution of comment letters over sample years is steady within each region, not varies across years within region. Therefore, our results are not driven by geographic preference when the SEC selects and reviews the filings in different years.

5. Conclusion

In this study, we investigate if the presence of 10-K comment letters for one of more clients in an audit office reveals the systematic problems that results in comment letters for other concurrent client firms in the same office. We first show that the office with client commented by the SEC in previous year are more likely to have new clients in

the same industry receiving comment letters, suggesting the comment letters are contagious within industry through interlinked auditor office. Moreover, such contagion effect varies over the types of comment letters. The contagion effect only exists when the issues fall into auditors' responsibilities in a larger extent, i.e. accounting rule and disclosure issues. As discussed in the introduction, our results should be of interests to companies, investors, regulators, and accounting firms.

Next, we examine how the office size matters in the contagion effect. The results show that larger Big 4 audit office could mitigate the spillover effect of comment letters and proves the office size is also an important factor in contagion.

Finally, this study provide evidence that the SEC comment letter review process has deterrence benefit. Through the engagement of auditors in resolving comment letters, even non-commented companies could experience fewer disclosure issues in accounting in subsequent years. The statistics of comment letters display the decreasing trend over the years after 2008. This archive evidence supports the prior behavior studies that document the benefit of auditor experience.

Table 2.1 Sample Selection

	Model (1)	Model (2) and (3)
Company-years observations available in the Compustat Annually Data File from the years 2005 to 2015 with non-missing assets	99,048	
Less:		
Observations with missing CIK number to merge with Audit Analytics Data	(12,417)	
Observations with missing auditor name or auditor location in Audit Analytics	(12,753)	
Observations from two industries (Utilities and Financial)	(17,822)	
Observations with missing data necessary to calculate control variables	(24,026)	
Observations with auditor other than Big4 or Tier2	(5,315)	
Final Sample	26,715	
Less:		
Observations without receiving an accounting-related comment letter		(20,743) ¹⁰
Final Sample		5,972

Table 2.2 Descriptive Statistics

Panel A: Distributional Properties of Variables					
Variable	Mean	Std Dev	25%	Median	75%
<i>AuditorAffected</i>	0.458	0.498	0	0	1
<i>M_Weak</i>	0.185	0.388	0	0	0
<i>Restate</i>	0.197	0.398	0	0	0
<i>LnMarketCap</i>	6.813	2.023	5.424	6.741	8.137
<i>HighVolatility</i>	0.250	0.433	0	0	0
<i>FirmAge</i>	22.232	15.605	11	17	29
<i>Loss</i>	0.305	0.460	0	0	1
<i>BankruptcyRank</i>	3.733	5.264	1.627	3.047	5.016
			-		
<i>SalesGrowth</i>	0.123	0.425	0.031	0.067	0.191
<i>M&A</i>	0.210	0.407	0	0	0
<i>Restructuring</i>	0.350	0.477	0	0	1
<i>ExtFinancing</i>	0.002	0.165	0	0	0
<i>Large</i>	0.891	0.311	1	1	1
<i>Litigation</i>	0.254	0.435	0	0	1
<i>AudTenure</i>	7.562	3.812	5	7	10
<i>AuditorResign</i>	0.022	0.147	0	0	0

¹⁰ We compare the comment letter conversations on EDGAR website and in the Audit Analytics database, some conversations are incomplete on the Audit Analytics database. We, therefore, delete observations where the first letter date occurs earlier than the 10-K filing date. Besides, the whole conversation needs to contain the initial letter that SEC send to companies, at least one response letter from companies, and the final letter with “no further comment” from SEC to close the file. So, we also exclude conversations with less than three letters.

<i>AuditorDismiss</i>	0.111	0.314	0	0	0
<i>Big4</i>	0.899	0.302	1	1	1
<i>Clean_Past2</i>	0.583	0.493	0	1	1

AuditorAffected is set to 1 when the audit office has at least one client in the same industry other than firm *i* received a comment letter in last year, and 0 otherwise. *Big4* is one if the company hires a Big 4 auditor in year *t*, and 0 otherwise. See Appendix C for definitions of all other variables.

Panel B: Distribution of comment letters by year						
Year	Observation	No. Office	No. Comment Letter	No. Acctg-related Comment Letter	No.Topics	Rounds
2005	2,770	510	678 (24.5%)	626 (22.6%)	12.88	2.78
2006	2,681	516	692 (25.8%)	615 (22.9%)	12.80	2.64
2007	2,602	504	822 (31.6%)	625 (24%)	13.80	2.75
2008	2,573	503	976 (37.9%)	731 (28.4%)	15.62	2.91
2009	2,497	503	966 (38.7%)	650 (26%)	12.74	2.94
2010	2,349	487	753 (32.1%)	580 (24.7%)	9.88	2.69
2011	2,322	478	765 (32.9%)	598 (25.8%)	8.46	2.66
2012	2,230	439	703 (31.5%)	538 (24.1%)	8.01	2.61
2013	2,203	433	576 (26.1%)	441 (20%)	7.21	2.56
2014	2,248	445	520 (23.1%)	361 (16.1%)	6.52	2.53
2015	2,240	456	294 (13.1%)	207 (9.2%)	7.09	2.30
			7,451	5,972		
Total	26,715	5,274	(27.9%)	(22.4%)	115.01	29.36
Mean	2,429	479	677	542	10.46	2.67

Panel C: Distribution of comment letters by year and region

Year	No. Firms	No. Firms receiving 10-K CLs	% of firms receiving 10-K CLs	Proportion of firms receiving a 10-K CL in each region							
				Canada	Foreign	US Mid Atlantic	US Midwest	US New England	US Southeast	US Southwest	US West
2005	2770	678	24.48	6.31	1.32	26.63	32.95	26.03	28.98	28.41	26.71
2006	2681	692	25.81	5.05	1.59	29.90	24.94	28.97	32.11	35.77	30.71
2007	2602	822	31.59	13.73	2.66	32.90	35.29	32.84	39.81	42.86	36.43
2008	2573	976	37.93	6.42	5.03	46.35	46.88	42.51	41.07	46.51	42.61
2009	2497	966	38.69	13.40	5.97	43.61	46.08	43.46	41.83	48.24	45.56
2010	2349	753	32.06	3.77	3.25	42.78	34.12	30.77	40.97	38.56	38.76
2011	2322	765	32.95	8.33	5.34	40.77	42.51	37.57	36.07	38.24	38.82
2012	2230	703	31.52	4.42	3.30	39.77	39.38	35.40	43.36	40.71	34.08
2013	2203	576	26.15	4.31	3.30	36.69	30.92	24.36	34.25	27.43	32.72
2014	2248	520	23.13	3.48	2.29	31.12	30.32	29.38	28.13	27.04	25.62
2015	2240	294	13.13	0.00	1.11	15.61	18.26	14.11	14.40	17.60	16.89

Table 2.3 Effect of Auditor Office with SEC 10-K Comment Letter Recipients

Panel A: Logistic regressions, dependent variable is <i>CommentLetter</i>			
VARIABLES	Prediction	(1)	(2)
Test Variable			
<i>AuditorAffected</i>	+	0.3030***	0.2582***
(p-value)		(0.000)	(0.000)
Section 408 Criteria			
<i>M_Weak</i>	—	0.1158***	0.1306***
<i>Restate</i>	+	0.2045***	0.1962***
<i>HighVolatility</i>	+	-0.0150	0.0246
<i>LnMarketCap</i>	+	0.1120***	0.0896***
Other Company Characteristics			
<i>FirmAge</i>	?	0.0084***	0.0048***
<i>Loss</i>	+	-0.0330	0.0338
<i>BankruptcyRank</i>	+	0.0011	-0.0009
<i>SalesGrowth</i>	+	0.0497**	0.0653**
<i>M&A</i>	+	0.1610***	0.1297***
<i>Restructuring</i>	+	0.2224***	0.2128***
<i>ExtFinancing</i>	—	-0.0353	-0.0015
<i>Large</i>	+	0.3726***	0.3279***
<i>Litigation</i>	?	-0.0667*	-0.0617*
Other Auditor Characteristics			
<i>Big4</i>	—	-0.3455***	-0.3522***
<i>AudTenure</i>	—	0.0216***	0.0046
<i>AuditorResign</i>	+	-0.1487**	-0.1968**
<i>AuditorDismiss</i>	+	0.1273***	0.0791**
<i>NumClients</i>	+	0.0081***	0.0077***
Governance Characteristics			
<i>CEO_Chair</i>	+		0.1426***
<i>CFO_Tenure</i>	?		0.0933***
<i>CEO_Tenure</i>	?		0.0276***
Other			
<i>Clean_Past2</i>	?	-0.1754***	-0.0593
Constant	?	-3.6081***	-3.5935***
Observations			
		26,715	26,715
Industry FE			
		YES	YES
Year FE			
		YES	YES
Firm Cluster			
		YES	YES
GovMissing			
		NO	YES
Pseudo R-squared			
		0.1044	0.1230

*, **, *** Represent significance at the 0.10, 0.05, and 0.01 levels, respectively. P-value are one- (two-) tailed when a prediction is (is not) made. *AuditorAffected* is set to 1 when the audit office has at least one client in the same industry other than firm *i* received a comment letter in last year, and 0 otherwise. See Appendix C for definitions of all other variables.

Panel B: Logistic regressions, dependent variable is <i>CommentLetter</i>			
VARIABLES	Prediction	(1)	(2)
Test Variable			
<i>AuditorAffected_Acctg</i>	+	0.1338***	0.1007**
(P-value)		(0.0065)	(0.0421)
<i>AuditorAffected_NonAcctg</i>	?	0.0275	0.0025
(P-value)		(0.5989)	(0.9622)
Section 408 Criteria			
<i>M_Weak</i>	—	0.1166***	0.1315***
<i>Restate</i>	+	0.2068***	0.1990***
<i>HighVolatility</i>	+	-0.0161	0.0244
<i>LnMarketCap</i>	+	0.1107***	0.0881***
Other Company Characteristics			
<i>FirmAge</i>	?	0.0086***	0.0049***
<i>Loss</i>	+	-0.0314	0.0368
<i>BankruptcyRank</i>	+	0.0012	-0.0009
<i>SalesGrowth</i>	+	0.0497*	0.0659**
<i>M&A</i>	+	0.1646***	0.1327***
<i>Restructuring</i>	+	0.2238***	0.2147***
<i>ExtFinancing</i>	—	-0.0438	-0.0091
<i>Large</i>	+	0.3746***	0.3308***
<i>Litigation</i>	?	-0.0639	-0.0592
Other Auditor Characteristics			
<i>Big4</i>	—	-0.3402***	-0.3482***
<i>AudTenure</i>	—	0.0227***	0.0053
<i>AuditorResign</i>	+	-0.1462*	-0.1958**
<i>AuditorDismiss</i>	+	0.1315***	0.0823*
<i>NumClients</i>	+	0.0111***	0.0108***
Governance Characteristics			
<i>CEO_Chair</i>	+		0.1505***
<i>CFO_Tenure</i>	?		0.0950***
<i>CEO_Tenure</i>	?		0.0275***
Other			
<i>Clean_Past2</i>	?	-0.1491***	-0.0435
Constant	?	-3.6109***	-3.5845***
Observations			
		26,715	26,715
Industry FE			
		YES	YES
Year FE			
		YES	YES
Firm Cluster			
		YES	YES
GovMissing			
		NO	YES
Pseudo R-squared			
		0.1012	0.1204

*, **, *** Represent significance at the 0.10, 0.05, and 0.01 levels,

respectively. P-value are one- (two-) tailed when a prediction is (is not) made. *AuditorAffected_Acctg* (*AuditorAffected_NonAcctg*) is set to 1 when the audit office has at least one client in the same industry other than firm *i* received (non) accounting-related comment letters in last year, and 0 otherwise. See Appendix C for definitions of all other variables.

Table 2.4 Joint Effects of Auditor Office Size and Auditor Office with 10-K Comment Letter Recipients

Logistic regressions, dependent variable is <i>CommentLetter</i>					
VARIABLES	Prediction	Big 4		Tier 2	
		(1)	(2)	(3)	(4)
Test Variable					
<i>AuditorAffected</i>	+	0.3513***	0.3058***	0.1944*	0.2024*
<i>LargeOffice</i>	?	0.1400*	0.1535*	0.3061	0.2897
<i>AuditorAffected*</i> <i>LargeOffice</i>	—	-0.1248*	-0.1421**	-0.2888	-0.2923
Section 408 Criteria					
<i>M_Weak</i>	—	0.1210***	0.1389***	0.0332	0.0404
<i>Restate</i>	+	0.1979***	0.1910***	0.2064**	0.2126**
<i>HighVolatility</i>	+	-0.0252	0.0247	0.0081	0.0027
<i>LnMarketCap</i>	+	0.1021***	0.0826***	0.3014***	0.2605***
Other Company Characteristics					
<i>FirmAge</i>	?	0.0086***	0.0048***	0.0069*	0.0056
<i>Loss</i>	+	-0.0531	0.0226	0.1794**	0.1840**
<i>BankruptcyRank</i>	+	0.0006	-0.0015	0.0008	-0.0002
<i>SalesGrowth</i>	+	0.0487*	0.0638**	0.0364	0.0486
<i>M&A</i>	+	0.1588***	0.1257***	0.0560	0.0665
<i>Restructuring</i>	+	0.2349***	0.2270***	0.0156	0.0043
<i>ExtFinancing</i>	—	-0.0057	0.0285	-0.3621*	-0.3334*
<i>Large</i>	+	0.3652***	0.3210***	0.1716	0.1902
<i>Litigation</i>	?	-0.0795*	-0.0771	0.1023	0.1113
Other Auditor Characteristics					
<i>AudTenure</i>	—	0.0200***	0.0025	0.0183	0.0155
<i>AuditorResign</i>	+	-0.2404**	-0.2672**	-0.1159	-0.1186
<i>AuditorDismiss</i>	+	0.1412***	0.0953**	0.0426	0.0435
<i>NumClients</i>	+	0.0064***	0.0061***	-0.0106	-0.0111
Governance Characteristics					
<i>CEO_Chair</i>	+		0.1400***		0.0272
<i>CFO_Tenure</i>	?		0.0907***		0.0907***
<i>CEO_Tenure</i>	?		0.0298***		0.0015
Other					
<i>Clean_Past2</i>	?	-0.2389***	-0.1178***	0.4888***	0.5227***
Constant	?	-3.8323***	-3.8485***	-4.7606***	-4.7037***
Observations		24,006	24,006	2,709	2,709
Industry FE		YES	YES	YES	YES
Year FE		YES	YES	YES	YES
Firm Cluster		YES	YES	YES	YES
GovMissing		NO	YES	NO	YES
Pseudo R-squared		0.1096	0.1286	0.1162	0.1212

*, **, *** Represent significance at the 0.10, 0.05, and 0.01 levels, respectively. P-value are one- (two-) tailed when a prediction is (is not) made. *AuditorAffected* is set to 1 when the audit office has at least one client in the same industry other than firm i comment letters in last year, and 0 otherwise. *LargeOffice* equals to one if the auditor office is larger than the 75th percentile value of *OfficeSize* for Big 4 and Tier 2 offices, and zero

otherwise. See Appendix C for definitions of all other variables.

Table 2.5 The Cost of Remediation Estimation Results for Model (2) and (3)

Panel A: Logit regression, depend variable is <i>NumTopics</i>			
VARIABLES	Prediction	(1)	(2)
Test Variable			
<i>AuditorExp_Past2</i>	—	-0.6295***	-0.6268***
Section 408 Criteria			
<i>M_Weak</i>	—	0.3886**	0.3877**
<i>Restate</i>	+	0.1018	0.1040
<i>HighVolatility</i>	+	-0.1098	-0.1085
<i>LnMarketCap</i>	+	0.0525	0.0498
Other Company Characteristics			
<i>FirmAge</i>	?	0.0052	0.0050
<i>Loss</i>	+	0.6000***	0.5956***
<i>BankruptcyRank</i>	+	-0.0401***	-0.0403***
<i>SalesGrowth</i>	+	-0.2067	-0.2055
<i>M&A</i>	+	0.3907**	0.3950**
<i>Restructuring</i>	+	-0.0438	-0.0448
<i>ExtFinancing</i>	—	0.7194	0.7140
<i>Large</i>	+	1.1519***	1.1513***
<i>Litigation</i>	?	-1.3403***	-1.3446***
Other Auditor Characteristics			
<i>Big4</i>	—	-0.3214	-0.3187
<i>AudTenure</i>	—	-0.0199	-0.0191
<i>AuditorResign</i>	+	-0.1749	-0.1714
<i>AuditorDismiss</i>	+	-0.3772*	-0.3789*
<i>NumClients</i>	+	-0.0095	-0.0100*
Governance Characteristics			
<i>CEO_Chair</i>	+		-0.0789
<i>CFO_Tenure</i>	?		-0.0514
<i>CEO_Tenure</i>	?		0.0325
Other			
<i>Clean_Past2</i>	?	0.6285***	0.6291***
<i>NumFilings</i>	+	2.6002***	2.6025***
Constant	?	6.7233***	6.7451***
Observations		5,972	5,972
Industry FE		YES	YES
Year FE		YES	YES
Firm Cluster		YES	YES

GovMissing	NO	YES
Adjusted R-squared	0.241	0.241

Panel B: Logit regression, depend variable is <i>Rounds</i>			
VARIABLES	Prediction	(1)	(2)
Test Variable			
<i>AuditorExp_Past2</i>	—	-0.0503*	-0.0505*
Section 408 Criteria			
<i>M_Weak</i>	—	0.0389	0.0385
<i>Restate</i>	+	0.0411*	0.0410*
<i>HighVolatility</i>	+	0.0150	0.0135
<i>LnMarketCap</i>	+	0.0431***	0.0440***
Other Company Characteristics			
<i>FirmAge</i>	?	0.0018**	0.0019**
<i>Loss</i>	+	0.0654**	0.0645**
<i>BankruptcyRank</i>	+	-0.0048**	-0.0047**
<i>SalesGrowth</i>	+	0.0419*	0.0413*
<i>M&A</i>	+	0.0430*	0.0428*
<i>Restructuring</i>	+	-0.0150	-0.0147
<i>ExtFinancing</i>	—	0.0464	0.0459
<i>Large</i>	+	-0.0141	-0.0139
<i>Litigation</i>	?	-0.0527*	-0.0517
Other Auditor Characteristics			
<i>Big4</i>	—	-0.0993**	-0.0997**
<i>AudTenure</i>	—	0.0007	0.0010
<i>AuditorResign</i>	+	0.1286*	0.1293*
<i>AuditorDismiss</i>	+	0.0147	0.0162
<i>NumClients</i>	+	0.0001	0.0001
Governance Characteristics			
<i>CEO_Chair</i>	+		0.0140
<i>CFO_Tenure</i>	?		0.0029
<i>CEO_Tenure</i>	?		-0.0044
Other			
<i>Clean_Past2</i>	?	-0.0238	-0.0247
<i>NumFilings</i>	+	0.0067	0.0061
<i>NumTopics</i>	+	0.0256***	0.0257***
Constant	?	1.8034***	1.7984***
Observations		5,972	5,972
Industry FE		YES	YES
Year FE		YES	YES
Firm Cluster		YES	YES

GovMissing	NO	YES
Adjusted R-squared	0.100	0.100

*, **, *** Represent significance at the 0.10, 0.05, and 0.01 levels, respectively. P-value are one- (two-) tailed when a prediction is (is not) made. *AuditorExp_Past2* is set to 1 when the audit office has experience in resolving comment letters for clients in a certain industry, and 0 otherwise. See Appendix C for definitions of all other variables. The dependent variable in Panel A is the number of issues addressed in the comment letter (*NumTopics*). In Panel B, the dependent variable is number of rounds from the first comment letter to the last one (*Rounds*).

ESSAY 3: Revolving Doors for SEC Accountants

1. Introduction

Revolving doors for SEC accountants, whereby SEC hires accountants from accounting or other firms they regulate and SEC accountants leave to join accounting and other firms they previously regulated, are common. For example, Paul A. Beswick served as the SEC's Chief Accountant from Dec 2012 to May 2014. Prior to joining the SEC in 2007 he was partner at Ernst & Young LLP and after leaving the SEC in 2014 he returned as a partner to Ernst and Young LLP.¹ Though such connections of SEC with the big four accounting firms are to be expected as the SEC seeks top accounting talent for its regulatory effort it also raises concern about regulatory capture by the big four.² In this paper, we examine the effect of revolving doors among SEC accountants on the SEC regulatory efforts.

Outbound revolving doors arise when accountants that work at the SEC leave the SEC to work for public firms that are regulated by the SEC or auditing firms that advice firms regulated by the SEC. Do the prospects of future job opportunities impact the effort of SEC accountants while at the SEC? If public firms and auditing firms seek regulatory expertise when they hire SEC accountants, then the accountants will put in effort in their SEC activities to increase regulatory experience and their future job potential (the human capital hypothesis). In contrast, if SEC accountants are hired not for their knowledge but

¹ See "File under Regulatory Capture: Deloitte's Fireside Chats" by Francine McKenna in Forbes and available at <https://www.forbes.com/sites/francinemckenna/2011/08/22/file-under-regulatory-capture-deloittes-fireside-chats/#27fc405f5a2d>.

² See "File under Regulatory Capture: Deloitte's Fireside Chats" by Francine McKenna in Forbes and available at <https://www.forbes.com/sites/francinemckenna/2011/08/22/file-under-regulatory-capture-deloittes-fireside-chats/#27fc405f5a2d>.

for their connections with the SEC then accountants seeking outside employment are likely to spend efforts in networking rather than regulatory activities (rent seeking hypothesis). Therefore, under the human capital hypothesis outbound revolving doors should be associated with increased regulatory effort while rent seeking hypothesis with reduced regulatory effort.

Inbound revolving doors arise when the SEC hires accountants from public firms they regulate and auditing firms. If they are hired by the SEC for their talent and knowledge of the firm activities that are to be regulated, then these inbound accountants should be effective regulators. In contrast, if the hired accountants protect the interests of firms and auditing firms they came from, there are likely to be compromised regulators. Like the outbound accountants, under the human capital hypothesis the inbound accountants are likely to be associated with increased regulatory effort while under the rent seeking hypothesis we should see lower regulatory effort.

We collect data on the career paths of SEC accountants to examine if outbound and inbound accountants are associated with increased regulatory effort. We capture the regulatory effort of outbound and inbound SEC accountants by the substantivizes of the comment letters they issued while they worked at the SEC. The SEC's Division of Corporate Finance has the mandate to review all public firms at least once in three years. In the course of this review, the SEC sends comment letters to the firm to seek clarification or raise concerns. The review of firm filings and the consequent comment letters are initiated by accountants that work for the Division of Corporate Finance along with lawyers. We use three measures of the nature of comment letters to capture how material the comment letters are and hence how substantive the regulatory effort of the accountants that

initiated it. As comment letters that refer to the firm's 10-K filing and those that raise revenue recognition issues have been shown to be more material, we use the likelihood of the accountant issuing a 10-K related and revenue related comment letter to capture their regulatory effort. Complex issues and concern often require several rounds of communication between the SEC and the firm and its auditors. Lastly, we use the number of rounds in a comment letter conversation to capture how material and substantive the comment letter is.

The data consists of all comment letters issued by the SEC over the period 2005 to 2015. We identify all SEC employees that worked on the comment letter as those employees who signed the comment letter or who were designated as those the firms could contact for queries and questions. We use the Federal employee database to identify which of these employees are accountants. The final dataset includes 351 unique accountants that issued 49,660 comment letters.

We use two ways to identify the accountants that left the SEC, that is the outbound accountants. First, we use the Federal employee database to identify employees that no longer work at the SEC and hence were outbound. Of the 351 unique accountants, 124 or 35% are outbound. Second, we search on LinkedIn for all 351 accountants to get data on the job after they leave the SEC. We are able to get LinkedIn information for only 163 of the accountants. Of these 163, about 52 leave the SEC a similar fraction seen in the full sample. For these 163 accountants, we also collect details of prior job and education qualifications. We find that 143 of these come from public and private firms including accounting firms with the remaining being fresh graduates.

We begin by examining the regulatory effort of outbound accountants. In the full sample, we find that outbound accountants are less likely to issue 10-K related comment letter, less likely to issue revenue related comment letter and their comment letters have fewer rounds. However, this lower regulatory effort is concentrated among outbound accountants for which we do not have LinkedIn information. The outbound revolvers with no LinkedIn profile have longer tenures at SEC, higher paygrades and higher salaries. For outbound accountants with LinkedIn profile, there is no difference in the severity of their comment letters from those that do not leave the SEC. Focusing on the accountants for which we have LinkedIn information we next examine accountants that join a big 4 accounting firm. If an accountant joins E&Y after leaving the SEC, does this accountant go easy on comment letters to firms that are audited by E&Y? We find some evidence that outbound accountants that join a big 4 accounting firm issue less severe comment letters to firms that are audited by their prospective employer and this effect is stronger in their last year at the SEC and is mitigated for accountant that join senior positions.

We then examine inbound accountants and find that relative to fresh graduates they are associated with more substantive comment letters. We distinguish between inbound accountants that come from corporate firms and those from accounting firms and find no difference between them in the severity of their comment letters. Lastly, we examine if accountants hired from big 4 accounting firms issue less severe comment letters to firms audited by their prior employer. We find evidence that only in the first year of the employment at the SEC, the inbound accountants from big 4 firms issue less severe comment letters to firms audited by their prior employer. There is no evidence of continued bias towards their prior employer in future years.

In summary, we collect data on the career paths of accountants that work at the SEC and are responsible for the review of firms disclosure and the issuance of comment letters to firms. We find little evidence that outbound SEC accountants or inbound SEC accountants compromise the severity of their comment letters to favor their prospective or prior employer except in the last and the first year at the SEC. This is the first paper to examine the revolving door for accountants at the SEC. Overall, the evidence does not support the claims that big four accounting firms have captured the SEC regulatory effort.

2. Related literature and hypotheses

2.1 Literature review

Revolving doors have been studied in both theoretical and empirical research. Che (1995) provides a model that regulators are ex-ante motivated by external job opportunities and thus exert effort in line with maximizing these external opportunities. If future employers seek regulatory expertise, then regulators will exert effort in developing this expertise. This Human Capital Hypothesis suggests that accountants employed at the SEC seeking outside opportunities at the Big four accounting firms will put in greater effort and issue more substantive and severe comment letters while they are at the SEC. Two recent empirical studies provide evidence in support of Che's model. DeHaan, Kedia, Koh and Rajgopal (2015) document that SEC lawyers, who leave to join private law firms, conduct more aggressive enforcement while they are at the SEC. Kempf (2017) presents evidence for analysts in rating agencies. She documents that the ratings by analysts who leave to join investment banks are more accurate than those by non-revolving analysts.

However, if the future employer seeks the accountant's social networks and influence with the regulator, the accountant will spend less effort in their regulatory duties and more effort in developing their networks (Che 1995). This rent seeking hypothesis predicts that regulators hired for influence will be associated with lax regulatory effort towards future employers. A recent report by the Project on Government Oversight (POGO) reveals some cases, in which lax regulatory oversight arises from SEC officials' revolving door incentives. Academics, Congress members, and investors have also raised concerns about the impact of revolving door on the SEC's efficiency, ethics, and independence (Coates 2001, Michael A. Perino 2004, Freeman 2004, Langevoort 2006, Lewis, Einhorn 2009).

Our study is the first to examine whether the revolving choice of SEC accountants affect SEC comment letter review process. Under "human capital" hypothesis, the open revolving doors for SEC accountants are associated with more severe comment letters. However, under "rent seeking" hypothesis, the revolver accountants should be associated with less severe and material comments.

2.2 SEC comment letter process

In this section, we outline the SEC comment letter review process in brief. The SEC is required by Section 408 of the Sarbanes Oxley-Act (2002) to review issuers' disclosures no less frequently than once every three years. The review process is conducted by the Division of Corporation Finance (DCF) through 11 offices, staffed mostly with accountants and lawyers. Due to resource limitation, less than 20 percent of filers have been reviewed by the SEC each year prior to SOX. The percentage is increasing by year and has reached

51 in 2015 (SEC 2016), suggesting that the SEC needs to self-determine a group of companies to review in each year³.

During the review process, the SEC staffs evaluate companies' disclosure and initiate comment letters for further explanation or revision when they identify conflicts with SEC rules and applicable accounting standards, or inadequacy of clarity or detail in the disclosures. Depending on the nature of the issue and firm's response, it may take several rounds of communication to resolve the comments.

3. Data and research design

3.1 Data collection process

We obtain SEC comment letters from Audit Analytics. The sample period begins at 2005, the first year the SEC released the comment letters publicly. The sample ends in 2015 as this is the last year for which Federal employee data is available. We need the Federal employee data to get information on whether the SEC accountant is still employed with the SEC along with other employee specific details⁴. We begin with a list of 54,877 comment letters initiated by the SEC⁵ and exclude firms not covered in Compustat for a final sample of 23,257 comment letters (See Table 3.1).

[--Insert Table 3.1 here--]

³ The SEC has not publicly disclosed the selection criteria in the review process.

⁴ The federal employee data can be accessed through FederalPay.org at <https://www.federalpay.org/>.

⁵ After reviewing the filings, the SEC may upload an initial comment letter to a particular company. Firms are required to respond to the comment letters within ten days to address the issues or add explanations. Depending on the nature of the issue and firm's response, it may take several rounds of communication letters to resolve the comments. Following Cassell et al. (2013), we use the initial comment letter to construct the sample and capture the nature of each conversation.

We next gather data on the employees associated with the comment letter. For each comment letter, we identify the corresponding SEC employees associated with it through the original pdf file released on EDGAR system. Specifically, we extract the names of signature staff (those that have signed the comment letter) and contact staff (those whose names are listed as contacts for the firm regarding the comment letter) appearing on each comment letter and construct a complete list of staff at the Division of Corporation Finance from 2004 to 2015. We then follow these employees on the Federal Employee Database to identify if they were accountants or not. We find that 351 unique accountants were associated with comment letters over the sample period with the rest being lawyers.⁶

As we want to study characteristics of comment letters associated with different accountants we identify all comments letters an accountant was associated with. As more than one accountant may be involved with a comment letter, the same comment letter may be assigned to more than one accountant. On average 2.14 accountants are involved in a comment letter for a total of 49,660 accountant comment letter observations. If a named SEC accountant is not listed as an employee on the Federal Employee Database then the SEC accountant is classified as having left the SEC, that is classified as an out-bound revolver. We find that of the 351 unique accountants about 124 or 35% leave the SEC.

As we want to study whether the nature of the job the accountant pursues after leaving the SEC or was working at prior to joining the SEC has an impact on his regulatory effort, we next gather information on the career paths of the SEC accountants. We search

⁶ The Division of Corporate Finance performs its primary review responsibilities through 11 offices, each of which is staffed with 25 to 35 professionals, primarily accountants and lawyers. (See <https://www.sec.gov/divisions/corpfin/cffilingreview.htm>). We use the database of Federal Pay to identify whether the staff holds an attorney or accounting occupation (<https://www.federalpay.org/employees>).

for the accountant on LinkedIn and gather information on each SEC accountant's education, working experience prior to the SEC if any and the post-SEC employer when relevant.⁷ Of the 351 accountants that were associated with comment letters we were able to obtain information for only 163 on LinkedIn. It is only for this smaller sample, referred to as the LinkedIn Sample, that we have information on the employer before and after SEC and hence it is in this sample that we conduct most of our tests. We find that of these 163 accountants, 52 accountants or about 32% left the SEC or were classified as *Out-bound*. Though the LinkedIn sample is much smaller than the full sample, the fraction of outbound accountants is roughly the same. About 143 or 88% of the sample joins the SEC from other organizations rather than straight after college (See Panel B, Table 3.1).

We detail the complete data collection process in Appendix E and illustrate the information gathered through a discussion of one comment letter sent to Viking Investments Group, Inc. filed on December 21, 2012. We identify two SEC staff engaged in this conversation. One of the two employees is Aamira Chaudhry, an accountant with the SEC since 2009. Aamira Chaudhry LinkedIn profile states that she obtained her bachelor degree from the University of Southern California and worked with Ernst & Young for 6 years prior to joining the SEC.

3.2 Data Description

For the LinkedIn sample, we find that the SEC accountants mostly leave to join corporates, both public and private, along with the Big 4 accounting firms (See Panel A of Table 3.2). A similar pattern is also seen for inbound accountants. The Big 4 accounting

⁷ We had two RA search for all accountants on LinkedIn. Each RA information was cross checked with the other RA to ensure minimum error and highest probability of finding the accountant information.

firms are the largest source of where the SEC hires from followed by private corporate firms.

As seen in Panel B, the SEC hires almost equally from all the Big 4 accounting firms as the share of each firm in inbound revolvers is about the same. However, accountants that leave the SEC are most likely to join Deloitte and E&Y relative to the other two accounting firms in our sample period. We find that there are 6 accountants that are hired by the SEC from the big 4 and then eventually leave the SEC to join their prior employer. Half of these 6 accountants are from Deloitte.

We also examine the positions that outbound accountants join in the Big 4 accounting firms. The majority of them go as partners or senior managers (See Panel C). Subsequently, we will examine the effect of joining in senior positions on the accountant's comment letter activity while at the SEC.

[--Insert Table 3.2 here--]

3.3 Measuring the severity of comment letters

We use several measures to capture the severity of the comment letters. First, we identify if a 10-K filing is addressed in the comment letter. As stated earlier, the SEC reviews disclosures by issuers through Form 10-K, 10-Q, 8-K, S-1, DEF14A and other filings. Comment letters targeted at 10-K are likely to be more substantive for two reasons. First, 10-K is one the most informative filings and comment letters addressing 10-K are of more interest to investors and have more significant implications (Dechow, Lawrence et al. 2016, Cassell, Dreher et al. 2013). Second, 10-K related comment letters are associated

with higher likelihood of subsequent restatement, amendment, and enforcement (Cassell, Cunningham et al. 2017, Feroz, Park et al. 1991, Dechow, Lawrence et al. 2016). We create an indicator variable, 10-K that takes the value of one if the comment letter targets the 10-K filing. We expect 10-K comment letters to be more substantive and important. As seen in Table 3.3, Panel A, 66% of the sample is 10-K related.

[--Insert Table 3.3 here--]

The second measure of comment letter severity is whether the letter pertains to revenue recognition issue. The SEC emphasizes revenue recognition as one of the critical accounting issues addressed in comment letters (SEC 2013). Comment letters, requesting clarifying questions on relatively minor issues or making disclosure adjustments in future filings, are less material. Further, as pointed out by Dechow et. al. (2016) executives are more concerned about receiving revenue recognition comment letters and trade prior to the public disclosure of such comment letters. Therefore, comment letters relating to revenue recognition are likely to be seen as more material, and severe. The indicator variable *Revenue Recognition* takes the value of one when comment letters address revenue issues. In our sample, 20.5% of the sample address revenue recognition issues.

The third measure of substantive comment letters is the number of rounds in the comment letter conversation. Cassel et al. (2013) argue that the number of rounds capture the cost of remediation as more rounds indicate that firms need to devote higher resources to the resolution of the comment letter. The greater is the cost the more important and substantive the comment letter is likely to be. To capture this, we create the variable *Rounds* that is the number of letters from the SEC between the initial letter to the closing letter within the conversation. The mean number of rounds in our sample is 2.5. We do not rely

on the total time taken to close the comment letter as the duration of conversation does not always measure the time and effort dispensed by the SEC accountants. The duration is substantially impacted by the time companies and their auditors take to respond to the SEC. Therefore, we do not use the span to capture severity of comment letters though we report it in Table 3.3. The average span for our sample is about 76 days. We also collect some other characteristics of comment letters. On average, the comment letter raises 10 topics and mention 1.5 different files (forms). The average team size or number of employees on a comment letter is 4.1.

As can be seen in Panel B, more severe comment letters, that is 10K and revenue recognition related comment letters and those with more rounds, have higher spans or longer duration, cover more topics and refer to more files. 10K related comment letters and those with more rounds are more likely to be issued to larger firms and those less likely to be making losses. In contrast, revenue related comment letters are more likely to be issued to smaller firms, with less leverage, and higher market to book. Since firm characteristics are important in determining the characteristics of comment letters, we control for these in multivariate estimation.

Under the human capital hypothesis, outbound SEC accountants⁸ should be associated with more material comment letters as captured by a higher likelihood of 10-K related letters, a higher likelihood of revenue recognition letters and more rounds. However, under the rent seeking hypothesis outbound and inbound SEC revolvers should

⁸ We refer them as revolvers or revolver accountants for concision in the following part on this paper.

be associated with less material comment letters. The average characteristics of the firm whose comment letters comprise our sample are displayed in Panel C of Table 3.3.

4. Outbound Accountants

In this section we examine outbound SEC accountants and their differences with SEC accountants that do not leave the SEC.

As seen in Table 3.4, SEC accountants that leave (Outbound) are significantly less likely to issue a 10-K related or revenue recognition related comment letter. Comment letters by Outbound accountants also have significantly fewer rounds. This suggest that comment letters by outbound accountants are less material than those of non-revolvers. Further, there are differences between the accountants. Outbound revolvers not surprisingly have lower tenures at the SEC, earn less despite have a more senior position (paygrade), less likely to have a graduate degree and less likely to have graduated from a top 50 undergraduate degree. This suggests that non-revolvers are likely to be higher ability than outbound accountants.

[--Insert Table 3.4 here--]

As the above suggests that the outbound revolvers tend to be less qualified than the non-revolvers, it raises the concern that many accountants who leave the SEC may not do so because they were lured away with better prospects but perhaps let go for performance issues. These low performing SEC accountants that leave the SEC are more likely to not have a LinkedIn profile. Therefore, we next restrict the outbound accountants to those for whom we have LinkedIn profile (Group C). We see less evidence that these outbound

accountants with LinkedIn data issue less material comment letters. In contrast, we find a significantly greater likelihood of issuing a revenue related comment letter and initiating comment letter conversations that have more rounds. These LinkedIn outbound accountants work at the SEC for smaller time periods, are though they earn less they are more junior accountants.

Lastly, we examine those among the outbound accountants that join Big 4 accounting firms (Group D). We find that these accountants are more likely to issue 10-K related comment letter and initiate conversations that last longer. Though these are less likely to have graduate degree they are more likely to have an undergraduate degree from a top 50 accounting school. We control for these characteristics in our regression estimations to follow.

4.1 Multivariate Analysis for Outbound Accountants

In this section, we control for firm characteristics that might also impact the severity of the comment letters issues. As mentioned before, we use three proxies for the severity of the comment letters. As two of the measures, *10-K* and *Revenue Recognition* are indicator variables we estimate logit models for these and OLS for the third measure *Rounds*. We cluster all standard errors by accountants because the observations are measured the accountant-letter level. Industry and year fixed effects are included.

The key variable of interest is *Outbound*, an indicator variable that equals to one if the SEC accountant on the comment letter left the SEC to work at other employers during our sample period. First, we control for the characteristics of the firm that is receiving the comment letter. Specifically, we include the size of the company (*Size*), Leverage, Market-

to-book ratio (*MB*), operating performance as captured by return on assets (*ROA*), *Loss*, an indicator variable that takes the value of one if the firm reports negative net income. Second, we control for auditor characteristic by including *Big4*, an indicator variable that takes the value of one if the auditor is a big four accounting firm. and *Tier2*, an indicator variable that takes the value of one if the auditors is a tier 2 audit firm. This is in line with prior literature (Blokdijs, Driehuis et al. 2006, Boone, Khurana et al. 2010, Cassell, Giroux et al. 2013) as these auditor characteristics are negatively associated with the probability of receiving comment letters (Cassell, Dreher et al. 2013).

Lastly, we control for accountant characteristics. We include the variable *Paygrade* that captures the seniority of the accountant at the SEC that is likely to impact the quality of comment letters issued. We also control for the accountant's experience at the SEC by including *Tenure*, the number of years that the accountant works at the SEC. More complicated comment letters may require larger teams of SEC accountants, and therefore, we include the size of SEC accountant team (*Team_Size*) in our estimation.

In Panel C, when the dependent variable is *Rounds*, we follow Cassel et al. (2013) and add two more variables to control for the number of files referred to in the comment letter (*NumFiles*) and the number of topics addressed in the letter (*NumTopics*), because both the number of filings referred to and the number of topics addressed could affect the number of rounds in the comment letter conversation.

As seen in Table 3.5, Outbound revolvers are associated with a lower likelihood of receiving a 10-K related comment letter, a lower likelihood of receiving a comment letter that raises revenue recognition issues and comment letters with significantly fewer rounds. This is in line with the univariate evidence and suggests that outbound SEC accountants

are associated with less severe comment letters. As we do not have LinkedIn information for all these lawyers, next we examine separately the behavior of outbound revolvers with LinkedIn information and those without.

As seen in Panel B of Table 3.5, it is the outbound revolvers with no LinkedIn information that are associated with lower comment letters. The outbound revolvers with LinkedIn information are not different from Non-revolvers in their propensity to issue comment letters related to 10-K or addressing revenue recognition issues. Further, outbound accountants with LinkedIn information are likely to issue comment letters that involve more rounds.

[--Insert Table 3.5 here--]

4.2 Outbound Accountants that join Big 4 Accounting Firms

In this section, we examine if outbound accountants that leave the SEC to join Big 4 accounting firms. Specifically, we examine if the prospect of join a particular big four accounting firm, say E&Y makes the SEC accountant issue milder/ stronger comment letters to clients of E&Y that it reviews. Under the rent seeking (human capital) hypothesis, the SEC accountant will issue less (more) severe comment letters of clients of E&Y. To examine this we create a variable, *Out_Same_Big4*, that takes the value of one when the letter is addressed to the client of a particular Big 4 that the accountant leaves the SEC to join, that is his future employer.

As seen in Table 3.6, the coefficient of *Out_Same_Big4* is negative and significant in Panel A but insignificant in Panel B and C. Outbound accountants are less likely to issue a 10-K related comment letters to clients of their future big four accounting firm. However,

there is no evidence of milder comment letter as captured by the other two proxies of comment letter severity. Overall, the results are somewhat consistent with the rent seeking hypothesis.

Next, we conduct three cross-sectional analyses to examine when the prospect of joining a Big 4 accounting firm leads to significant effects on accountants' regulatory effort.

[--Insert Table 3.6 here--]

4.2.1 Last year in the SEC

Prior literature that has examined revolving door incentives has highlighted that the effects are strongest in the last year before the job change. Cornaggia et al. (2016) documents that transitioning credit analysts inflate the ratings of their new employers in the last year at the credit rating agency. Dehaan, Kedia, Koh and Rajgopal (2015) provide some evidence that SEC lawyers exhibit laxer enforcement prior to leaving the SEC. Therefore, we first examine whether the outbound accountants are more likely to change regulatory effort during the last year. To examine the last year effect, we create an indicator variable *Last Year* that is equal to one for comment letters that are initiated during the accountants last year at the SEC. We further examine if this last year effect is stronger for outbound revolvers that leave to join Big four accounting firms.

As seen in Panel A of Table 3.7, The coefficient of *Last Year* is insignificant for 10-K, positive for Panel B (Revenue) and negative for Panel C (Rounds). The results are mixed and suggest that last year of outbound accountants is associated with a higher likelihood of issue revenue recognition related comment letters but comment letters with lower rounds. However, the results for the last year of outbound accountants that leave for

Big four accounting firms are clear. The coefficient of the interaction of *Last Year* with *Out_Same_Big4* is negative for all proxies and significant for two of the three panels. Outbound accountants that leave to join big 4 firms issue significantly milder comment letters, as captured by *revenue related* comments letters and *Rounds*, to clients of their prospective employer in their last year at the SEC. Though the last year does not differ for their propensity of issue 10-K related comment letters to clients of prospective employer—this is significantly less likely well before their last year at the SEC.

[--Insert Table 3.7 here--]

4.2.2 High positions at the Big Four Accounting Firm

Prior literature also documents that the rent seeking or human capital incentives are stronger the more lucrative the outside opportunity. Cornaggia et al. (2016) document that credit analysts inflate the credit ratings to a greater extent when they seek job opportunities at top financial institutions. However, Glaser et al. (2000) argues that the career prospects are strengthened by cultivating reputation for more aggressive enforcement and not by satisfying potential target employers suggesting that the best employers are likely to hire the toughest regulators. Therefore, in this section, we examine whether more senior position in prospective big four accounting firms are filled by outbound revolvers with a milder or tougher regulatory effort.

To capture senior positions, we create an indicator variable *High Position* that takes the value of one if the outbound accountant leaves the SEC to join a big four accounting firm as a partner or senior manager. As seen in Panel B of Table 3.7, the coefficients on

the interaction of *High_position* with *Out_Same_Big4* is positive and significant for *10-K* and *Revenue*. This suggests that outbound accountants joining senior positions at big 4 firms, are tougher on the clients of their prospective employer.

5. Inbound revolvers

In this section, we examine the “inbound” SEC accountants, i.e. accountants that join the SEC from other firms as opposed to joining straight from college. The human capital hypothesis predicts that those inbound accountants, with better understanding and specialized knowledge of a particular industry, benefit the SEC by issuing more severe comment letters. In contrast, the rent seeking hypothesis suggests that inbound revolvers could be influenced by the interests of the former employer and be sympathetic by issuing milder comment letters.

Among the 163 SEC accountants with LinkedIn information, 76 of them join the SEC from accounting firms and 59 join from Big 4 accounting firms. The remaining 67 accountants are from other employers, including corporate firms. We first test the overall effect of *Inbound* accountants on comment letters. As seen in Table 3.8, the coefficient of *Inbound* is positive and significant for 10-K and Revenue suggesting that inbound accountants issued more severe comment letters.

[--Insert Table 3.8 here--]

Next, we examine different cross sectional tests to understand when the regulatory effort of inbound accountants is more likely to get impacted. First, we examine if there is any difference between SEC accountants hired from corporate firms (*In_Corporate*) as

opposed to from accounting firms (*In_Accounting*). As seen in Panel A of Table 3.9, there is no difference between these two.

[--Insert Table 3.9 here--]

In line with the analysis for outbound accountants, we examine if accountants hired from Big 4 accounting firms are milder towards clients of the prior employer. To examine this, we create a variable *In_Same_Big4* that takes the value of one if the inbound accountant is issuing a comment letter to a client of its prior big 4 employer. As seen in Panel B, though the coefficient of *In_Same_Big4* is negative, suggesting milder comment letters, for all three proxies it is never significant. Finally, in Panel C we examine if the incentive to be milder towards clients of prior big 4 employer is stronger in the first year the accountant joins the SEC we create the variable *First Year*. This takes the value of one in the first year of the Inbound accountant. The interaction of *First Year* with *In_Same_Big4* is negative and significant for all proxies suggesting compromise in the regulatory effort in the first year at the SEC.

6. Conclusion

We collect the career paths for SEC accountants and examine how their job opportunities affect the SEC comment letter review process. In contrast to the studies supporting human capital hypothesis among the SEC lawyers, we find evidence, though limited, of rent seeking hypothesis for revolver accountants at the SEC. Specifically, we find that accountants that leave the SEC to join Big four accounting firm issue milder comment letters to the clients of their future big 4 employer in their last year at the SEC. Similarly, we find that accountants that join the SEC from big four accounting firms also

issue milder comment letters to the clients of the prior big four employer in their first year at the SEC.

We are among the first to study the revolving doors for accountants and shed light on the potential regulatory capture by the big four accounting firms. Whereas several prior studies have examined outbound revolver incentives we are also among the first studies to examine inbound revolving incentives and document that influence of former employer creates some conflicts of interest especially in the first year.

Table 3.1 Sample refinement

The comment letters were obtained from Audit Analytics over the period 2005 to 2015. A comment letter is identified by their unique ID and captures a comment letter conversation. An accountant involved with the comment letter is an employee that has been identified as an accountant by the Federal Employee Information. Employee involved with the Comment Letter are those that sign the comment letter or those who are named as employees the firm could Contact regarding the conversation.

Panel A: Comment Letter	
Total comment letters sample with SEC employee information (2005-2015)	54,877
Less: firms not on Compustat	19,426
Less: companies have not complete financial data in Compustat	4,776
Less: comment letters without SEC Accountant employee	7,418
Final Sample of Comment Letters for analysis	23,257
Number of individual Accountant identified	351
Final Sample of Accountant-Comment Letters	49,660

Panel B: Individual Accountant	
Out-bound revolvers are accountants who left the SEC over the sample period, 2005 to 2015, to work with other employers. An accountant with the SEC is considered outbound if he no longer appears in the Federal Employee Information. Out Bound Revolvers with LinkedIn information are those accountants that left the SEC and can be traced on LinkedIn as joining another employer. In-bound revolvers are accountants that have working experience with another firm before joining the SEC. See Appendix F for the detailed description of the data collection process for individual SEC accountants.	
<u>Total</u>	
Identified Accountants from comment letter database (2005-2015)	351
Out-bound Revolvers	124
 <u>Reduced Sample</u>	
Among Accountants with LinkedIn	163
In-bound Revolvers	143
Out-bound Revolvers	52

Table 3.2 Description of SEC Accountant Data

The sample consist of all SEC accountants associated with comment letters over the period 2005 to 2015 with data available on LinkedIn. The sample consists of 163 accountants.

Panel A: Description of Employers before and after SEC

The Outbound column describes the data for the post SEC employers for outbound revolvers. Outbound revolvers are those that leave the SEC during the sample period. The Inbound Column describes the employers prior to the SEC for inbound revolvers. Inbound revolvers are those that join the SEC from another employer. Big 4 refers to the big 4 accounting firms. Other accounting firms refers to accounting firms that are not the big 4. Public (private) firm is a corporate employer that is (not) publicly listed.

<u>Outbound Revolvers</u>	<u>Inbound Revolvers</u>
---------------------------	--------------------------

Big 4	16	59
Other Accounting firm	6	17
Corporation Private firm	25	57
Public firm	14	43
Other ⁹	5	10
Total	52	143

Panel B: Big 4 Accounting Firms

The table displays the number of outbound SEC accountants that join each of the big 4 accounting firms and the number of inbound SEC accountants from each of the big 4 accounting firms. The last column details the number of accountants that come (inbound) and go to (outbound) the same big 4 firm.

Big 4	Outbound Accountants	Inbound Accountants	Inbound and Outbound
Deloitte	7	15	3
E&Y	6	15	0
KPMG	1	13	1
PWC	2	16	2
Total	16	59	6

Panel C: Positions of Outbound Accountants hired by Big 4 Accounting Firms

Titles	Number of accountants	Percentage of total
Partner	5	31.25
Senior Manager	5	31.25
Manager	2	12.5
Audit Manager	1	6.25
Director	1	6.25
Executive Director	1	6.25
National Office Managing Director	1	6.25
Total	16	100

Table 3.3 Description of Comment Letters

Panel A: Comment Letter Severity

⁹ This category includes university, non-profit organizations, other governmental division, and regulator.

	<u>N</u>	<u>Mean</u>	<u>p25</u>	<u>Median</u>	<u>p75</u>	<u>Std Dev</u>
10-K	49,660	0.660	0.000	1.000	1.000	0.474
Revenue_Recognition	49,660	0.205	0.000	0.000	0.000	0.404
Rounds	49,660	2.526	2.000	2.000	3.000	1.115
Num_Topics	49,660	10.080	4.000	8.000	15.000	7.191
Num_Files	49,660	1.572	1.000	1.000	2.000	0.899
Span	49,660	75.796	27.000	50.000	94.000	84.540
Team_Size	49,660	4.142	3.000	4.000	5.000	1.200

Panel B: Characteristics

The table displays characteristics of less and more severe comment letters for each of the different measures of comment letter severity. ***, **, * indicate significance at 1%, 5% and 10% respectively. The t statistics is for the difference between column A and B of each category.

	10-K related		Revenue Recognition related		Rounds	
	No (A)	Yes(B)	No (A)	Yes (B)	<=2 (A)	>2(B)
Span	71.59	77.96***	71.28	93.29***	42.83	122.73***
Number of Topics	9.47	10.40***	9.28	13.16***	7.99	13.05***
Number of Files	1.19	1.77***	1.55	1.65***	1.45	1.75***
Size	5.59	6.70***	6.41	5.99***	6.14	6.58***
Leverage	0.22	0.23	0.23	0.19***	0.22	0.23
MB	2.58	2.58	2.41	3.24***	2.57	2.60
Loss	0.50	0.32***	0.38	0.39*	0.39	0.37***
Number of Obs.	16,868	32,792	39,465	10,195	29,170	20,490

Panel C: Sample Statistics

	<u>N</u>	<u>Mean</u>	<u>p25</u>	<u>Median</u>	<u>p75</u>	<u>Std Dev</u>
Firm Characteristics						
Size	49,660	6.321	4.600	6.552	8.252	2.841
Leverage	49,660	0.225	0.001	0.118	0.321	0.318
MB	49,660	2.580	0.983	1.782	3.324	8.041
ROA	49,660	-0.411	-0.075	0.016	0.069	2.157
Loss	49,660	0.383	0.000	0.000	1.000	0.486
Accountants Characteristics						
Tenure	49,660	6.282	4.000	6.000	9.000	3.064
Num_CL	49,660	47.076	17.000	28.000	60.000	46.719
Percent_10K	49,660	0.660	0.571	0.692	0.800	0.191

Percent_Revenue	49,660	0.205	0.090	0.185	0.300	0.147
Salary	49,660	16208	14119	160330.	183445.	31255.610
		5.580	3.500	000	000	
PayGrade	49,660	14.666	14.000	14.000	15.000	1.282
Graduate	15,262	0.307	0.000	0.000	1.000	0.461
Top50	15,229	0.441	0.000	0.000	1.000	0.497

Table 3.4 Univariate Tests for Outbound Revolvers

This table displays differences between accountants that do not leave the SEC (Non Revolvers) and those that leave the SEC (Outbound). Group B includes all SEC outbound accounts, Group C those outbound accountants with LinkedIn profiles and group D as those among group C that join big \$ accounting firms. 10-K (revenue recognition) is an indicator variable that takes the value of one if the comment letter was related to 10-K (revenue issue). Tenure is the number of years at SEC since 2004, Graduate (Top 50) is an indicator variable if the accountant has a graduate degree (graduated from a top 50 college ranking in accounting). Paygrade is the position at the SEC with higher numbers designating more senior positions.

	Non Revolvers	Outbound		Outbound with LinkedIn		Outbound to Big 4	
	A.	B.	(A- B)	C.	(A-C)	D.	(A- D)
10-K	0.68	0.55	21.68***	0.67	0.80	0.70	-2.01**
Revenue Recognition	0.21	0.17	7.89***	0.27	-5.24***	0.22	-0.95
Rounds	2.55	2.37	12.41***	2.60	-1.75***	2.65	-2.91***
Accountants Characteristics							
Tenure	6.53	4.89	48.33***	3.55	49.68***	4.36	18.61***
Salary	162,210	161,401	1.80*	131,816	46.64***	128,279	35.50***
PayGrade	14.58	15.12	- 27.41***	13.99	20.44***	13.80	21.54***
Graduate	0.31	0.25	5.14***	0.24	5.14***	0.19	6.58***
Top50	0.44	0.40	2.93***	0.40	2.93***	0.57	-5.84***
Firm Characteristics							
Size	6.42	5.80	16.99***	5.88	7.51***	5.68	5.96***
Leverage	0.22	0.23	-0.37	0.22	-0.01	0.25	-2.05**
MB	2.56	2.72	-1.49	2.61	-0.26	2.19	1.17
Loss	0.37	0.43	-9.89***	0.37	0.63	0.38	0.39
Other CL Characteristics							
Span	75.75	76.03	-0.25	89.09	-5.57***	84.10	-2.58***
Num_Topics	10.04	10.31	-2.82***	11.22	-6.30***	11.11	-3.75***
NumFiles	1.57	1.59	-1.71*	1.67	-4.26***	1.70	-3.60***
Team_Size	4.17	3.98	12.63***	3.80	13.28***	3.84	7.12***

Number of Obs.	42,011	7,649		1,674		682	

Table 3.5 Analysis of outbound revolvers

The unit of observation is an accountant-comment letters that span the full sample of 351 accountants. Column (1), (2) and (3) report the results for three dependent variables representing the severity of comment letters. These are an indicator variable if the comment letter targets the 10-K, raises revenue recognition issues and the number of rounds in the comment letter conversation. Column (1) and (2) are logistic models while Column (3) is an OLS model. The independent variable, Outbound, takes the value of 1 if the letter is issued by a SEC accountant that eventually leaves the SEC, that is out-bound accountant. Other control variables are as listed in Appendix F. Year and industry fixed effects are included. The errors are clustered by accountants. *, **, *** Represents two-tailed significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A: The effect of out-bound revolvers in full sample

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	0.951	1.04	-1.129**	-1.99	2.167***	10.32
Outbound	-0.468*	-1.80	-0.361**	-1.97	-0.120*	-1.92
Size	0.027**	2.12	-0.021***	-2.64	0.048***	10.59
Leverage	0.182***	3.53	-0.288***	-5.10	-0.0077	-0.37
MB	-0.0010	-0.69	0.008***	5.00	0.0006	0.86
ROA	0.078***	10.53	0.071***	5.77	0.0018	0.55
Loss	-0.413***	-13.37	-0.073**	-2.49	0.0094	0.60
Big4	0.371***	7.35	0.174***	4.00	-0.127***	-5.81
Tier2	0.614***	10.18	0.131**	2.39	-0.102***	-4.31
PayGrade	-0.0460	-0.65	-0.0437	-0.98	-0.0109	-0.64
Team_Size	-0.086***	-2.64	0.070***	2.78	-0.054***	-5.21
Tenure	0.018	1.14	-0.003	-0.19	-0.017***	-3.32
Num_Topics					0.051***	38.03
Num_Files					0.072***	9.55
Observations	49,660		49,660		49,660	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1224		0.0931		0.1532	

Panel B: The LinkedIn Sample

This table is similar to that seen earlier but differentiates between outbound SEC accountants with and without LinkedIn Profiles. Out_LinkedIn is an indicator variable that

takes the value of one if the accountant left the SEC and whose profile (future employer) is available on LinkedIn. Out_NoLinkedIn is an indicator variable that takes the value of one if the outbound SEC accountant does not have a LinkedIn profile.

	10-K (dummy)		Revenue (dummy)		Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	0.656	0.77	-1.409***	-2.78	2.071***	10.41
Out_LinkedIn	0.109	1.03	0.131	1.25	0.073*	1.73
Out_NoLinkedIn	-0.633**	-2.11	-0.545**	-2.4	-0.177**	-2.48
Size	0.027**	2.14	-0.021***	-2.69	0.048***	10.76
Leverage	0.1822***	3.52	-0.287***	-5.09	-0.008	-0.38
MB	-0.001	-0.65	0.008***	5.06	0.001	0.89
ROA	0.078***	10.48	0.070***	5.75	0.002	0.45
Loss	-0.411***	-13.53	-0.071**	-2.49	0.010	0.67
Big4	0.373***	7.48			-	
			0.175***	4.01	0.129***	-5.79
Tier2	0.620***	10.33			-	
			0.133**	2.44	0.101***	-4.25
PayGrade	-0.030	-0.44	-0.029	-0.71	-0.006	-0.34
Team_Size	-0.084***	-2.62			-	
			0.071***	2.87	0.053***	-5.19
Tenure	0.022	1.43			-	
			0.001	0.07	0.016***	-3.00
Num_Topics					0.051***	38.26
Num_Files					0.071***	9.88
Observations	49,660		49,660		49,660	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R^2	0.1261		0.1128		0.1515	

Panel B: The differentiate effect of outbound revolvers between accountants with and without LinkedIn

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	0.656	0.77	-1.409***	-2.78	2.071***	10.41
Out_LinkedIn	0.109	1.03	0.131	1.25	0.073*	1.73
Out_NoLinkedIn	-0.633**	-2.11	-0.545**	-2.4	-0.177**	-2.48
Size	0.027**	2.14	-0.021***	-2.69	0.048***	10.76
Leverage	0.1822***	3.52	-0.287***	-5.09	-0.008	-0.38
MB	-0.001	-0.65	0.008***	5.06	0.001	0.89
ROA	0.078***	10.48	0.070***	5.75	0.002	0.45
Loss	-0.411***	-13.53	-0.071**	-2.49	0.010	0.67

Big4	0.373***	7.48	0.175***	4.01	-0.129***	-5.79
Tier2	0.620***	10.33	0.133**	2.44	-0.101***	-4.25
PayGrade	-0.030	-0.44	-0.029	-0.71	-0.006	-0.34
Team_Size	-0.084***	-2.62	0.071***	2.87	-0.053***	-5.19
Tenure	0.022	1.43	0.001	0.07	-0.016***	-3.00
Num_Topics					0.051***	38.26
Num_Files					0.071***	9.88
Observations	49,660		49,660		49,660	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1261		0.1128		0.1515	

Table 3.6 Analysis of Outbound Accountants to Big Four Firms

This sample is restricted to accountants with available information on LinkedIn. The sample consists of 19,127 accountant-comment letters. Column (1) and (2) are logistic models while Column (3) is an OLS estimation. Out_Same_Big4 is equal to 1 if the letters are issued to clients of the Big 4 that accountant eventually joins. Outbound, equals to 1 if the letter is issued by an out-bound accountant. Other control variables are as listed in Appendix F. Year and industry fixed effects are included and untabulated. The results are clustered by accountants. *, **, *** Represent two-tailed significance at the 0.10, 0.05, and 0.01 levels, respectively.

	(1)10-K		(2) Revenue		(3) Rounds	
	Est.	T-value	Est.	T-value	Est.	T-value
Intercept	-0.222	-0.38	-1.675***	-2.69	1.680***	6.56
Out_Same_Big4	-0.769**	-2.41	-0.266	-1.10	-0.012	-0.15
Outbound	0.161	1.22	0.080	0.67	0.057	1.09
Size	0.041	2.17	-0.029**	-2.00	0.048***	5.98
Leverage	0.130	1.61	-0.268**	-2.60	0.034	0.93
MB	0.000	-0.13	0.003	1.19	0.000	0.08
ROA	0.075***	5.65	0.086***	4.52	0.003	0.55
Loss	-0.350***	-6.96	-0.007	-0.13	0.068***	2.91
Big4	0.389***	5.77	0.217***	2.79	-0.111***	-2.96
Tier2	0.669***	7.28	0.064	0.73	-0.132***	-2.91
PayGrade	0.068*	1.67	-0.008	-0.19	0.026	1.48
Team_Size	-0.175***	-4.09	0.062***	2.33	-0.072***	-6.54
Tenure	0.018	0.84	0.007	0.29	-0.015**	-2.48
Graduate	-0.181*	-1.66	-0.125	-1.31	0.005	0.13
Num_Topics					0.049***	23.87
Num_Files					0.061***	5.81

Observations	19,127	19,127	19,127
Cluster	Accountant	Accountant	Accountant
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Pseudo or adjusted R²	0.1227	0.1313	0.1342

Table 3.7 Cross Sectional Analysis of Outbound Accountants to Big 4 Accounting Firms

This table displays partial results from models similar to those in Table 5. Column (1) and (2) are logit estimations while Column (3) is an OLS estimation with the dependent variables being 10-K indicator variable, a Revenue Related Indication variable and the Rounds respectively. Out_Same_Big4 equals to one if the outbound accountant issuing a comment letter to a client of a future employer, Last Year takes the value of one if the comment letter was issued in the accountants last year at the SEC. Other control variables, included but not tabulated are similar to those in Table 3.5 and are defined in Appendix F. Year and industry fixed effects are included and untabulated. The results are clustered by accountants. *, **, *** Indicates significance at the 0.10, 0.05, and 0.01 levels based on two-tailed tests, respectively.

Panel A: Last year at the SEC

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	-0.231	-0.40	-1.675***	-2.67	1.727***	7.29
Out_Same_Big4	-0.751**	-2.32	-0.194	-0.81	-0.001	-0.01
Pre_revolve	0.308	1.38	0.358**	2.05	-0.172***	-2.90
Out_Same_Big4*	0.092	0.14	-10.528***	-16.98	0.283	1.28
Pre_revolve						
Outbound	0.109	0.77	0.011	0.08	0.074*	1.68
Observations	19,127		19,127		19,127	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1229		0.1319		0.1310	

Panel B: Position at the Big 4 Accounting Firm

High_position takes the value of one if the comment letter is issued by an outbound SEC accountant to a client of a Big 4 firm where the accountant joins in a senior position (partner or senior manager).

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	-0.370	-0.63	-1.753***	-2.80	1.724***	7.11
Out_Same_Big4	-1.569***	-5.56	-0.683**	-2.00	0.035	0.33
High_Position	0.071	0.24	0.127	0.57	0.013	0.14

Out_Same_Big4*	2.525***	5.64	0.889*	1.87	-0.073	-0.52
High_Position						
Outbound	0.064	0.49	0.019	0.14	0.053	1.15
Observations	19,127		19,127		19,127	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1265		0.1319		0.1308	

Table 3.8 Inbound Accountants

This table presents the comment letter effort for “Inbound accountants”. Column (1) and (2) are logit models with the dependent variable being 10-K and Revenue Related respectively. Column (3) is an OLS estimation where the dependent variable is Rounds. Inbound takes the value of one if the accountant joins the SEC from another employer. All the variables are defined in Appendix F. Year and industry fixed effects are included and errors are clustered by accountants. *, **, *** Indicates significance at the 0.10, 0.05, and 0.01 levels based on two-tailed tests, respectively.

Panel A: The effect of overall in-bound revolvers

	(1)10-K		(2) Revenue		(3) Rounds	
	Est.	T-value	Est.	T-value	Est.	T-value
Intercept	-0.501	-0.92	-1.872***	-3.02	1.704***	6.08
Inbound	0.259**	2.02	0.223**	2.19	-0.014	-0.18
Size	0.044**	2.33	-0.027*	-1.92	0.048***	5.94
Leverage	0.126	1.57	-0.272***	-2.64	0.034	0.93
MB	0.000	-0.11	0.003***	1.20	0.000	0.08
ROA	0.075***	5.68	0.086***	4.50	0.003	0.56
Loss	-0.348***	-6.91	-0.007	-0.12	0.068***	2.91
Big4	0.358***	5.31	0.204**	2.60	-0.111***	-2.98
Tier2	0.660***	7.19	0.058	0.66	-0.132***	-2.92
PayGrade	0.069*	1.79	-0.011	-0.26	0.026	1.47
Team_Size	-0.174***	-4.11	0.062**	2.35	-0.072***	-6.57
Tenure	0.018	0.83	0.008	0.35	-0.016***	-2.67
Graduate	-0.178*	-1.66	-0.122	-1.34	0.002	0.06
Num_Topics					0.049***	23.92
Num_Files					0.062***	5.84
Observations	19,127		19,127		19,127	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	

Year FE	YES	YES	YES
Pseudo or adjusted R²	0.1215	0.1316	0.1340

Table 3.9 Cross sectional Analysis of Inbound Accountants

This table displays partial results of cross sectional analysis for Inbound Accountants. Control Variables listed in Table 3.8 were included but not displayed for brevity. All the variables are defined in Appendix F. Year and industry fixed effects are included and errors are clustered by accountants. *, **, *** Indicates significance at the 0.10, 0.05, and 0.01 levels based on two-tailed tests, respectively

Panel A: Inbound Accountants from Corporate and Big 4

In_Corporate takes the value of one if the comment letter was issued by an SEC accountant hired from a corporate firm. In_Acctg takes the value of one if the SEC accountant was hired from an accounting firm.

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	-0.233	-0.36	-1.871***	-2.85	1.706***	5.75
In_Corporate	-0.021	-0.12	0.131	1.28	-0.030	-0.59
In_Acctg	0.001	0.00	0.153	1.35	0.030	0.56
Size	0.044**	2.32	-0.027*	-1.94	0.048***	5.99
Leverage	0.128	1.59	-0.269**	-2.62	0.032	0.89
MB	0.000	-0.09	0.003	1.20	0.000	0.05
ROA	0.076***	5.67	0.086***	4.49	0.003	0.51
Loss	-0.346***	-6.89	-0.006	-0.11	0.068***	2.90
Big4	0.361***	5.35	0.206***	2.64	-0.114***	-3.09
Tier2	0.663***	7.23	0.058	0.66	-0.134***	-2.98
PayGrade	0.071*	1.73	-0.003	-0.07	0.026	1.31
Team_Size	-0.174***	-4.10	0.062**	2.34	-0.073***	-6.72
Tenure	0.015	0.72	0.006	0.24	-0.016***	-2.70
Graduate	-0.195*	-1.70	-0.131	-1.46	-0.019	-0.60
Num_Topics					0.049***	24.07
Num_Files					0.0622***	5.87
Observations	19,127		19,127		19,127	
cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1207		0.1314		0.1346	

Panel B: Analysis of Big 4 Inbound revolvers.

In_Same_Big4 is an indicator variable that takes the value of one if the comment letter was issued by a SEC accountant from a big 4 accounting firms to a client of his prior (Big 4) employer.

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	-0.491	-1.54	-1.861***	-5.27	1.709***	6.12
In_Same_Big4	-0.097	-1.30	-0.090	-1.05	-0.044	-1.32
Inbound	0.265***	3.31	0.229**	2.38	-0.011	-0.14
Size	0.044***	3.76	-0.027**	-2.19	0.048***	5.93
Leverage	0.126**	1.97	-0.272***	-3.39	0.034	0.93
MB	0.000	-0.12	0.003	1.18	0.000	0.07
ROA	0.075***	6.45	0.086***	4.83	0.003	0.55
Loss	-0.348***	-8.01	-0.007	-0.14	0.067***	2.90
Big4	0.368***	6.46	0.213***	3.15	-0.106***	-2.83
Tier2	0.660***	8.12	0.057	0.65	-0.132***	-2.92
PayGrade	0.068***	3.38	-0.012	-0.53	0.026	1.44
Team_Size	-0.174***	-9.74	0.062***	3.34	-0.072***	-6.57
Tenure	0.018*	1.72	0.009	0.64	-0.016***	-2.67
Graduate	-0.182***	-4.51	-0.126***	-2.68	0.000	0.01
Num_Topics					0.049***	23.96
Num_Files					0.062***	5.84
Observations	19,127		19,127		19,127	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1217		0.1317		0.1341	

Panel C: First year at the SEC for Big 4 inbound revolvers

In_Same_Big4 is an indicator variable that takes the value of one if the comment letter was issued by a SEC accountant from a big 4 accounting firms to a client of his prior (big 4) employer. First Year take the value of one if the comment letter was issued by an accountant in his first year at the SEC.

	(1)10-K		(2) Revenue		(3) Rounds	
	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>	<u>Est.</u>	<u>T-value</u>
Intercept	-0.626*	-1.85	-1.655***	-4.36	1.860***	6.78
In_Same_Big4	-0.052	-0.67	-0.066	-0.75	-0.033	-0.97
Post_revolve	0.118	1.44	-0.120	-1.28	-0.297**	-2.30

In_Same_Big4*	-0.614**	-2.07	-0.695*	-1.67	-0.105**	-2.34
Post_revolve						
Inbound	0.254***	3.15	0.244**	2.51	0.000	0.00
Observations	19,127		19,127		19,127	
Cluster	Accountant		Accountant		Accountant	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Pseudo or adjusted R²	0.1222		0.1322		0.1350	

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APPENDICES

Appendix A: Variable Definitions for ESSAY 1

Variables to calculate accruals:

TAC = income before extraordinary items (ibc) minus operating cash flow (oancf);

AT = natural logarithm of firm total assets (at);

REV = change of revenues (sale);

AR = change in receivables (rect)

CFO = operating cash flow (oancf);

PPE = end-of-year property, plant and equipment (ppeg);

ROA = earnings before extraordinary items in year t divided by total assets at the beginning of year t ;

$/DA/$ = absolute value of discretionary accruals;

Test variables:

D_{CD} = equals to 1 if a director of an affected firm holds director position in contagious firms; 0 otherwise;

D_{CDI} = equals to 1 if there is only one director of an affected firm holding director position in contagious firms; 0 otherwise;

D_{CD_MTI} = equals to 1 if there are multiple directors of affected firms holding director position in contagious firms; 0 otherwise;

NUM_CD = number of directors of affected firms holding director positions in contagious firms;

PERCENT_CD = percentage of directors of affected firms holding positions in contagious firms ($=NUM_CD/TOTAL\ BOARD\ MEMBERS$)

EXP_FIN = equals to 1 if an interlinked director has finance expertise; 0 otherwise;

EXP_ACC = equals to 1 if an interlinked director has accounting expertise; 0 otherwise;

PERCENT_BLOCK = the percentage of stocks held by block holders (an investor who holds more than five percent of outstanding shares);

NUM_BLOCK = the number of block holders;

PERCENT_LARGEST = shareholdings of the largest institution.

Other control variables:

LAG_DA = the value of *DA* in year t-1;

BOARD_SIZE = the total number of board of directors;

NUM_LINK = number of interlinked directors of a company on the corporate boards of contagious firms;

FIRM_SIZE = natural logarithm of firm total assets;

LOSS = 1 if the firm has negative income before extraordinary items and 0 otherwise;

LEVERAGE = long term debt divided by total assets at the beginning of year;

DELTA_SALE = the change in sales;

MB = market value of equity divided by the book value of equity at the beginning of year;

INST_ONWERSHIHP = the percentage of stocks held by institutional investors;

INST_HIGH = 1 if the total percentage of institutional shareholdings compared to the outstanding shares is greater than 70%, and 0 otherwise;

PERCENT_BLOCK = the percentage of stocks held by blockholders;

NUM_BLOCK = the total number of shares held by blockholders;

PERCENT_LARGEST = the percentage of shares held by the largest institution compared to the total number of outstanding shares;

FIRM_AGE = the number of year this firm has been on Compustat database;

M&A = 1 if the firm has a M&A event [*AQS*] > 0 in the year, and 0 otherwise;

ISSUE = 1 if the sum of new long-term debt [*DLTIS*] and new equity [*SSTK*] is greater than 2 percent of total Assets, and 0 otherwise;

RESTATE = 1 if the firm restates the financial report, and 0 otherwise.

MKV = the market value of the firm;

LINK_CONTAGIOUS = 1 if the company has a director who simultaneously sitting on a contagious company's board, and 0 otherwise;

P_LINKED = the likelihood of being linked to contagious companies through board of directors;

SEGMENT = the number of segments;

CITATION = the number of citations;

PATENT = the number of patents;

R&D = the research and development expenses;

Appendix B: Titles of corporate offices held by directors that signify accounting and finance expertise and titles of senior executive officers

I. Titles of Officers held by directors with Accounting Expertise

Chief Financial Officer
 Co-Chief Financial Officer
 Chief Accounting Officer
 Accounting Professional
 Controller

Note: Capital IQ allows certain variations in position names, we search a complete list of position names to also include abbreviations, lower/upper capital, space, and certain misspellings for the above titles.

II. Titles of Officers held by directors with Finance Expertise

Head of Corporate Finance
 Head of Investment Banking
 Investment Banking Professional
 Equity Analyst
 Fixed Income Analyst
 Other Analyst
 Investment Professional
 Chief Investment Officer
 Treasurer

Note: Capital IQ allows certain variations in position names, we search a complete list of position names to also include abbreviations, lower/upper capital, space, and certain misspellings for the above titles.

III. Titles of Senior Executive Officers

Senior Executive

Chief Executive Officer
 Chief Financial Officer
 Chief Operating Officer
 Other Key Executive
 Senior Key Executive
 Top Key Executive
 Treasurer
 Controller
 Chief Accounting Officer

Appendix C: Variable Definitions for ESSAY 2

CommentLetter = 1 when the firm receive a 10-K comment letter from SEC in year t , and 0 otherwise.

AuditorAffected = 1 when the audit office has at least one client in the same industry other than firm i received a comment letter in last year, and 0 otherwise.

AuditorAffected_Acctg = 1 when the audit office has at least one client in the same industry other than firm i received an accounting-related comment letter in last year, and 0 otherwise.

AuditorAffected_NonAcctg = 1 when the audit office has at least one client in the same industry other than firm i received a non-accounting related comment letter in last year, and zero otherwise.

LargeOffice = 1 for Big 4 auditor offices that are larger than the 75th percentile value of office size, otherwise 0. Office size is calculated as the natural log of the total dollar of audit fees charged to all audit clients within an auditor office in year t (Francis, Yu 2009, Francis, Michas 2013, Choi, Kim et al. 2010).

NumTopics = the total number of issue codes assigned by Audit Analytics database in the first comment letter (LIST_CL_ISSUE_TAXGROUP).

NumFiles = the total number of files is referred to the comment letter.

Rounds = total number of letters that SEC send to the companies in one conversation, representing the total rounds of communication between SEC and companies until the comment letter is closed with “no further comment”.

AuditorExp_Past2 = 1 if the auditor office has at least one client firm in a specific industry that received a 10-K comment letter from SEC.

Control variables:

$M_Weak = 1$ if the internal control audit opinion (SOX Section 404) or the management certification (SOX Section 302) is reported a material weakness in years t , $t-1$, or $t-2$, and 0 otherwise.

$Restate = 1$ if the company filed a restatement in years t , $t-1$, or $t-2$, and 0 otherwise.

$HighVolatility = 1$ if the volatility of abnormal monthly stock returns is in the highest quartile in year t , and 0 otherwise.

$LnMarketCap$ = the natural log of market capitalization.

$FirmAge$ = the total number of years that is available in Compustat.

$Loss = 1$ if earnings before extraordinary items is negative in year t , and zero otherwise.

$Bankruptcy$ = the decile rank of the company's Altman's Z-score. Altman's Z-score is calculated following (DeFond, Hung 2003) and (Edward I. Altman 1968) and is equal to $1.2 * [\text{net working capital (ACT-LCT)/total assets}] + 1.4 * [\text{retained earnings/total assets}] + 3.3 * [\text{earnings before interest and taxes/total assets}] + 0.6 * [\text{market value of equity/book value of liabilities}] + 1.0 * [\text{sales/total assets}]$.

$SalesGrowth$ = the percentage of change in annual sales from year $t-1$ to year t .

$M\&A = 1$ for non-zero acquisitions or mergers as reported by AQP in Compustat, and 0 otherwise.

$Restructuring = 1$ for non-zero restructuring costs reported by RCP in Compustat, and 0 otherwise.

$ExtFinancing$ = the sum of equity financing (the sales of preferred stock [SSTK] minus the purchase of common and preferred stock [PRSTKC] minus dividends [DV]) and

debt financing (long-term debt issued [DLTIS] minus long-term debt reduction [DLTR] minus the change in current debt [DLCCH]) scaled by total assets.

Large = 1 if the firm size is larger than 75 million, and 0 otherwise.

Litigation = 1 if the firm is in a highly litigious industry (four-digit SIC industry codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, or 7370-7374, following (Francis, Philbrick et al. 1994)), and zero otherwise.

Big4 = 1 if the firm has Big 4 auditor, 0 otherwise.

AudTenure = number of consecutive years the auditor has audited the firm.

AuditorResign = 1 if the auditor resigned in any of last three years, and 0 otherwise.

AuditorDismiss = 1 if the auditor was dismissed in any of the last three years, and 0 otherwise.

NumClients = the number of clients that the audit office has in year t-1.

CEO_Chair = 1 if the CEO is also the chairman of board, and zero otherwise.

CEO_Tenure = the tenure of the CEO.

CFO_Tenure = the tenure of the CFO.

Clean_Past2 = 1 if the company has not received any 10-K comment letters in the past two years.

Appendix D: An example of the 10-K comment letter issued by SEC



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Mail Stop 3561

December 23, 2015

Via E-mail

Mr. Douglas Roth
Chief Financial Officer
Aceto Corporation
4 Tri Harbor Court
Port Washington, NY 11050

Re: Aceto Corporation
Form 10-K for the Fiscal Year Ended June 30, 2015
Filed September 11, 2015
File No. 0-04217

Dear Mr. Roth:

We have limited our review of your filing to the financial statements and related disclosures and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to these comments within ten business days by providing the requested information or advise us as soon as possible when you will respond. If you do not believe our comments apply to your facts and circumstances, please tell us why in your response.

After reviewing your response to these comments, we may have additional comments.

10-K for the Fiscal Year Ended June 30, 2015
Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 22
Results of Operations, Page 27
Fiscal Year Ended June 30, 2015 Compared to Fiscal Year Ended June 30, 2014, page 27

1. To the extent changes in various line items reflected in your statement of income are due to more than one factor, please revise future filings to separately quantify and disclose the impact of each material factor on your results of operations. For example, on page 28 you indicate that net sales for the Human Health segment increased by \$65,046 for the year ended June 30, 2015 largely driven by an increase in sales of Rising Products due to the PACK acquisition as well as new generic product launches during the past two years and price increases in certain products. Please provide us your proposed disclosure revisions to the net sales and gross profit sections of your discussion and analysis for the

fiscal year ended June 30, 2015 compared to the fiscal year ended June 30, 2014. Refer to Item 303(a)(3) of Regulation S-K and SEC Release No. 33-8350.

2. Please also disclose in future filings the business reasons for material changes between periods in the income before taxes (presented in Note 19 of your financial statements) for each of your three segments, as well as the amounts shown in the Unallocated Corporate column. In circumstances where there is more than one business reason for a change between periods, please quantify the incremental impact of each individual business reason discussed on the overall change in the line item. Please provide us your proposed disclosure revisions to your discussion and analysis for the fiscal year ended June 30, 2015 compared to the fiscal year ended June 30, 2014.

Consolidated Financial Statements

Note 2. Summary of Significant Accounting Policies, page 55

3. On page 25, you discuss collaborative arrangements with pharmaceutical companies and royalty agreements, which may represent collaborative arrangements under ASC 808-10. These arrangements appear to be material and increasing. In future filings, please disclose in the footnotes to your financial statements each of the following:
 - Information about the nature and purpose of each type of collaborative arrangement,
 - Your rights and obligations under each type of collaborative arrangement,
 - Your accounting policy for the sales and costs associated with each type of collaborative arrangement, including whether they are presented on a gross basis, with the amounts earned by the pharmaceutical companies in each period reflected in your cost of sales,
 - The income statement classification and amounts attributable to each type of collaborative arrangement for each period presented and
 - Separately disclose this information for any individually significant collaboration arrangements.
 Please provide us your proposed disclosures. Refer to the guidance in ASC 808-10-50.

Note 6. Goodwill and Other Intangible Assets, page 65

4. Please disclose in future filings a rollforward of the changes in your goodwill allocated to each reportable segment. Please provide us your proposed disclosures. Refer to ASC 350-20-50-1.

Schedule II, page 82

5. On pages 57 and 66, you discuss a reserve for price concessions. On page 81, you discuss an estimate for product returns. In future filings, please include the Schedule II disclosures required by Rules 5-04 and 12-09 of Regulation S-X for each of these accounts in either Schedule II or in the footnotes to your financial statements. In doing

so, please also quantify and describe the nature and reason(s) for each type of deduction made from each account. Please provide us your proposed disclosures.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

You may contact Linda Cvrkel at (202) 551-3813 or Rufus Decker, Accounting Branch Chief, at (202) 551-3769 with any questions.

Sincerely,

/s/Tia L. Jenkins

Tia L. Jenkins
Senior Assistant Chief Accountant
Office of Beverages, Apparel and
Mining

Appendix E: Example of the data collection process

Step 1: SEC Comment Letter Release from SEC Website (EDGAR)



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

December 21, 2012

Via Mail

Tom Simeo
Chief Executive Officer
Viking Investments Group, Inc.
65 Broadway, 7th Floor
New York, NY 10006

**Re: Viking Investments Group, Inc.
Form 10-K for Fiscal Year Ended December 31, 2011
Filed on April 16, 2012
File No. 001-29219**

Dear Mr. Simeo:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within 10 business days by confirming that you will revise your document in future filings, amending your filing as indicated in comments 4, 5 and 6 below and providing any requested information. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-K for Fiscal Year Ended December 31, 2011

Item 8. Financial Statements and Supplementary Data

Note 1. Nature of Business and Going Concern, page F-10

1. We note that you acquired from Viking Nevis 566,813 shares of China Wood, Inc. stock in exchange for 14,481,420 share of your common stock. Subsequent to this transaction, Viking Nevis owned approximately 78% of your outstanding common stock giving them substantial ownership. Based on the above, it appears that this was a reverse acquisition transaction with Viking Nevis being the accounting acquirer. Please tell us how you accounted for this transaction and the authoritative accounting guidance you relied upon.
2. It appears that you estimated the value of the long term investment asset, which you

recorded as a result of the transaction discussed in the comment above, based upon a guarantee by Viking Nevis to buy back this stock at \$4.00 per share. However, based on the above it appears that this guarantee is not from an independent third party but instead from your accounting acquirer. Please tell us how you determined that it was appropriate to value the investment based on this guarantee.

3. We note that China Wood went public in April 2011 and has since filed no quarterly or annual reports and no Form 8-K's communicating information to investors about its operating results or status, or lack thereof. We also note that there is essentially no trading activity in the shares of China Wood. Based on the above, it is not clear how you were able to conclude your shares had a fair value of \$4.00 each, or \$2,267,252 in the aggregate. Please advise.

Exhibit 10

4. Please amend your filing to file the Guaranty and Repurchase Agreement with Viking Investment Group, LLC as an exhibit.

Exhibit 31.1

5. Please amend your filing including your Form 10-Qs for the quarters ended March 31, 2012, June 30, 2012 and September 30, 2012 to conform the language in the certification to exactly as it is stated in item 601(B)(31)(i).
6. Please amend your filing to file a certification for your principal financial officer.

Form 10-Q for Fiscal Quarter Ended September 30, 2012

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Continuing Operations, Page 6

7. We note that you recorded revenues of \$47,070 related to preliminary audit services. Please tell us in further detail the nature of the services you provided, to whom they were provided, and when you provided the services.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

You may contact Aamira Chaudhry at (202) 551-3389 if you have questions regarding comments on the financial statements and related matters. Please contact me at (202) 551-3380 with any other questions.

Sincerely,

Lyn Shenk
Branch Chief

In this comment letter conversation, Lyn Shenk is the signature accountant at the SEC. Aamira Chaudhry referred in the last paragraph is listed as a contact person and is potentially involved in the comment letter conversation. Therefore, we treat both the signature person and the contact person as the engaged SEC staff. We download the comment letters from 2004 to 2015 on EDGAR and generate a complete list of 878 SEC staff working at the Division of Corporation Finance during this period of time¹.

¹ We extract 1,889 person names from the original comment letter files. However, the name mentioned in the letter have variations by adding or dropping part of the middle name. For example, Mellissa Campbell Duru could be also written as Mellissa C. Duru, Mellissa C Duru, or Mellissa Duru; the nick names also used when they are referred by other individuals, such as Bill for Williams, Bob for Robert, Matt for Matthew etc.; typos from the original SEC file happens, such as Jennifer or Jenife for Jenifer, Linda Crvkel varies from Linda Cverkel, Linda Cvrkel, to Linda Cvrkl. Those variations are manually checked and treat them as the same person. After delete the duplications, we obtain a list of 878 SEC staffs.

Step 2: Employee Information from FederalPay.org


Federal Employee Profile — Aamira I. Chaudhry



Aamira I. Chaudhry
Title: Accountant
Agency: Securities and Exchange Commission

★ SK-14 ★

In 2016, Aamira I. Chaudhry was an Accountant at the Securities and Exchange Commission in Washington, District Of Columbia. began working at the Securities and Exchange Commission in 2009 with a starting salary of \$95,719. Since then, 's salary has increased to \$187,529 in 2016.

Aamira I. Chaudhry is a SK-14 under the sec emp formerly under gs, gm, and ez payscale.

Year	Occupation	Paygrade	Base Salary	Bonus	Location
2016	Accounting	SK-14	\$187,529	\$0	Washington, District of Columbia
2015	Accounting	SK-14	\$179,456	\$0	Washington, District of Columbia
2014	Accounting	SK-14	\$123,524	\$0	Washington, District of Columbia
2013	Accounting	SK-14	\$119,318	\$0	Washington, District of Columbia
2012	Accounting	SK-14	\$115,843	\$0	Washington, District of Columbia
2011	Accounting	SK-14	\$113,017	\$0	Washington, District of Columbia
2010	Accounting	SK-14	\$110,910	\$0	Washington, District of Columbia
2009	Accounting	SK-13	\$95,719	\$0	Washington, District of Columbia

On the FederalPay website, Aamira I. Chaudhry's employee information includes occupation, paygrade, and salary. We focus on accountant employees resulting in a list of 351 accountants.

Step 3: Information on accountant Aamira I. Chaudhry from LinkedIn

Below is the LinkedIn information for SEC accountant Aamira Chaudhry. We hand collect the working experience and education information from the website for each accountant.

<https://www.linkedin.com/in/aamira-chaudhry-a72a0298>

Experience**Staff Accountant**

U.S. Securities and Exchange Commission

Jan 2009 – Present • 9 yrs

**Audit Manager**

EY

Nov 2002 – Oct 2008 • 6 yrs

Greater Los Angeles Area

Education

University of Southern California - Marshall School of Business

Bachelor's degree & Masters of Accountancy, Accounting

Appendix F: Variable Definitions for ESSAY 3

(All Continuous variables are winsorized at 1% and 99%.)

10-K = 1 when the firm receives a 10-K comment letter from SEC in year *t*, and 0 otherwise. We use the list of forms (LIST_FORM_DATES) in Audit Analytics to identify a 10-K related comment letter.

Revenue = 1 when the firm receives a comment letter in revenue recognition from SEC in year *t*, and 0 otherwise. We use the taxonomy provided by Audit Analytics to identify revenue recognition-related comment letters.

Rounds = total number of letters that SEC sends to the companies in one conversation, representing the total rounds of communication between SEC and companies until the comment letter is closed with “no further comment”.

Outbound = 1 if the comment letter is engaged by an individual SEC accountant who revolves out in the post period, and 0 otherwise. (*Outbound* is split into two variables, *Out_LinkedIn* and

Out_NoLinkedIn, representing that the engaged out-bound revolvers have or have no public information on LinkedIn, respectively.)

Out_Same_Big4 = 1 if the letter is issued to the client of a certain Big 4 that the engaging accountants revolve to, and 0 otherwise.

Pre_revolve = 1 if the letter is written within one year of the accountant leaving the SEC, and 0 otherwise.

High_Position = 1 if the accountant revolves to Big 4 and hold a position as a partner or senior manager, otherwise 0.

Inbound = 1 if the accountants have prior working experience since graduation before they join in the SEC, otherwise 0. (*Inbound* is split into two variables, *In_Corporate* and *In_Acctg*, representing that the engaged accountants revolved from a corporate company and accounting firm, respectively.)

In_Same_Big4 = 1 if the letter is sent to the client of a certain Big 4 that the accountants revolve from, and 0 otherwise.

Post_revolve = 1 if the letter is written within one year of the accountant joining the SEC, and 0 otherwise.

Size = the natural log of market capitalization.

Leverage = long-term debt divided by total assets at the beginning of year;

MB = market value of equity divided by the book value of equity at the beginning of year;

ROA = earnings before extraordinary items in year *t* divided by total assets at the beginning of year *t*;

Loss = 1 if earnings before extraordinary items are negative in year *t*, and zero otherwise.

Big4 = 1 if the company engages a Big 4 audit firm, 0 otherwise.

Tier2 = 1 if the company is audit by one of the Tier 2 audit firm, 0 otherwise. (Tier 2 audit firms includes BDO Seidman, Crowe Horwath, Grant Thornton, and McGladrey & Pullen)

PayGrade = the paygrade of the accountant in the SEC. The source of this data is FederalPay, which contains the Civil Employee's Resource since 2004 at their website: <https://www.federalpay.org>.

Team_Size = the total number of SEC employees working on the comment letter.

Tenure = the total number of year that the accountants work in the SEC since 2004. This variable is calculated through the FederalPay data.

Graduate = 1 if the accountants have a graduate degree, otherwise 0. The source of this information is the accountant's personal LinkedIn page.

NumTopics = the total number of issue codes assigned by Audit Analytics database in the first comment letter (LIST_CL_ISSUE_TAXGROUP).

NumFiles = the total number of files is referred to the comment letter.