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Three Essays on the Voluntary Disclosure and Managerial Incentive

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THREE ESSAYS ON THE VOLUNTARY DISCLOSURE AND MANAGERIAL INCENTIVE

by

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DEDICATION

I dedicate my dissertation work to my family and many friends. I would like to thank my loving husband, Longhao Huang, for his unwavering support throughout my entire doctoral program. A special feeling of gratitude to my mother, Min Tong, and my parents-in-law, Bijun Huang and Rong Zhang, who have always encouraged me to chase my dream. This work is especially dedicated to my father, Tang Tuo, who was a great professor but passed away before I was able to achieve the PhD degree. I also appreciate my friends, Jingnan Zhao, Shipeng Han and Ji Yu, who always helped me throughout the process.

ABSTRACT

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The importance of an effective corporate communication with all stakeholders has been extensively debated in the business literature in the aftermath of 2007-2009 global financial crisis. To satisfy the demands of information users, companies are expected to disclose more inside information to outside public through the voluntary disclosure.

The first dissertation investigates the role of sustainability report which is a type of voluntary nonfinancial disclosure. I find that the release of sustainability report is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality. Moreover, the positive (negative) correlation between sustainability report and innate (discretionary) earnings quality is more (less) pronounced when the voluntary disclosure quality is high. I also find that the release of sustainability report is associated with higher audit fees, which suggests that the sustainability report cannot substitute the traditional financial statement.

The second dissertation investigates how the firm's cost stickiness strategy is associated with the firm's management earnings forecast (MEF). Through the empirical tests, I find that the firm's level of sticky cost is positively associated with the firm's propensity to issue MEF and the frequency of MEF. Moreover, I find that the firm's level of sticky cost is associated with more good earnings news forecasted by managers. Finally, I find that the relation between cost stickiness and MEF behaviors is more pronounced when the MEF is long-horizon oriented and when the firm efficiency is high.

This third dissertation investigates how industry peer firms tend to influence the specific firm's voluntary disclosure strategy. Through implementing the 2SLS regressions, I find that the specific firm's disclosure frequency, disclosure horizon and the disclosure of bad news are significantly influenced by its peers firms' disclosure behaviors. Moreover, certain types of firms tend to be more sensitive to their peer firms' voluntary disclosure strategy. Finally, I find that the specific leader-follower relation doesn't exist in the peer effects of disclosure strategy and thus the herding theory and free rider theory are not major reasons to explain this phenomenon. My dissertation contributes to accounting literature by providing new evidence in explaining the managerial incentive behind the voluntary disclosure.

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CHAPTER 1

INTRODUCTION

The importance of an effective corporate communication with all stakeholders including shareholders has been extensively debated in the business literature in the aftermath of 2007-2009 global financial crisis. The key indicator of business value have shifted from accounting profits and stock market performance, formerly, to firm reputation and sustainability performance, currently. Therefore, the transparency and value-relevance of conventional financial reporting has been questioned in terms of its capability to satisfy increasing information needs of all stakeholders. Many doubt whether those traditional financial metrics derived from financial statements can appropriately capture firm's long-term value creation ability. In recent years, users of corporate reports are demanding more relevant financial and non-financial on key performance indicators and forward looking information above and beyond conventional financial statements. To satisfy the demands of information users and decision makers, companies are expected to not only increase their reporting transparency in conventional financial statements but also disclose more inside information to outside public through different types of voluntary disclosure.

The first dissertation investigates the role of sustainability report through examining the associations among voluntary disclosure, earnings quality and audit fee. Recently more and more firms begin to release sustainability reports, one important channel of voluntary disclosure, to satisfy the needs of information users and increase the transparency of financial reporting. In this paper, I especially examine the effect of voluntary disclosure quality on those associations. Through Difference-in-Difference test, I find that the release of sustainability report is positively correlated with innate earnings quality and negatively correlated with

discretionary earnings quality. Moreover, the positive (negative) correlation between sustainability report and innate (discretionary) earnings quality is more (less) pronounced when the voluntary disclosure quality is high. I also find that the release of sustainability report is associated with higher audit fees and thus it suggests that the sustainability report cannot substitute the traditional financial statement. My conclusions are robust through additional tests of OLS regressions. This paper has important political, academic and industry application.

The second dissertation investigates how the firm's cost stickiness strategy is associated with the firm's management earnings forecast (MEF). I conjecture that the managerial incentive regarding the cost strategy and voluntary disclosure strategy are interdependent. When managers choose their cost management, they will also choose the corresponding management earnings forecast strategy to align their interests. Through the empirical tests with a sample between year 2005 and 2011, I find that the firm's level of sticky cost is positively associated with the firm's propensity to issue MEF and the frequency of MEF. Moreover, I find that the firm's level of sticky cost is associated with more good earnings news forecasted by managers. Finally, I find that the relation between cost stickiness and MEF behaviors is more pronounced when the MEF is long-horizon oriented and when the firm efficiency is high. My research builds a link between financial accounting information and managerial accounting information, and also provides new evidence to understand the managerial incentives behind each strategy chosen by managers.

This third dissertation investigates how industry peer firms tend to influence the specific firm's voluntary disclosure strategy. Through examining the empirical example of management earnings forecast between 2005 and 2011 and implementing the 2SLS regressions, I find that the specific firm's disclosure frequency, disclosure

horizon and the disclosure of bad news are significantly influenced by its peers firms' disclosure behaviors. Specifically, the increase in the peers' disclosure frequency, disclosure horizon and disclosure of bad news tend to encourage the specific firm to increase its disclosure frequency, disclosure horizon and disclosure of bad news. Moreover, certain firms (such as firms with S&P credit rating, higher profit, larger size or higher market-to-book ratio) tend to be more sensitive to their peer firms' voluntary disclosure strategy. Finally, I find that the specific leader-follower relation doesn't exist in the peer effects of disclosure strategy and thus the signaling theory, litigation risk and CEO reputation are more major reasons than herding theory and free rider theory in explaining this phenomenon.

The Figure 1 illustrate the framework of the dissertation and how the dissertation contributes to the current accounting literature. In the first paper, I investigate the association between financial statements and voluntary disclosure within the financial reporting system. Specifically, I examine how voluntary disclosure, measured as sustainability report, is associated with earnings quality and audit fee which are metrics derived from financial statements. In the second paper, I build a bridge between managerial accounting and financial accounting to investigate the interdependence between managers' strategies within the accounting information system. Finally, in the third paper, I discuss how the industry peer firms, which is an external factor outside the firm, can influence the specific firm's inside managerial strategy of voluntary disclosure. In conclusion, the dissertation can provide new evidence for the role of managerial incentive and managerial behaviors in the voluntary disclosure and has the academic, industry and political applications.

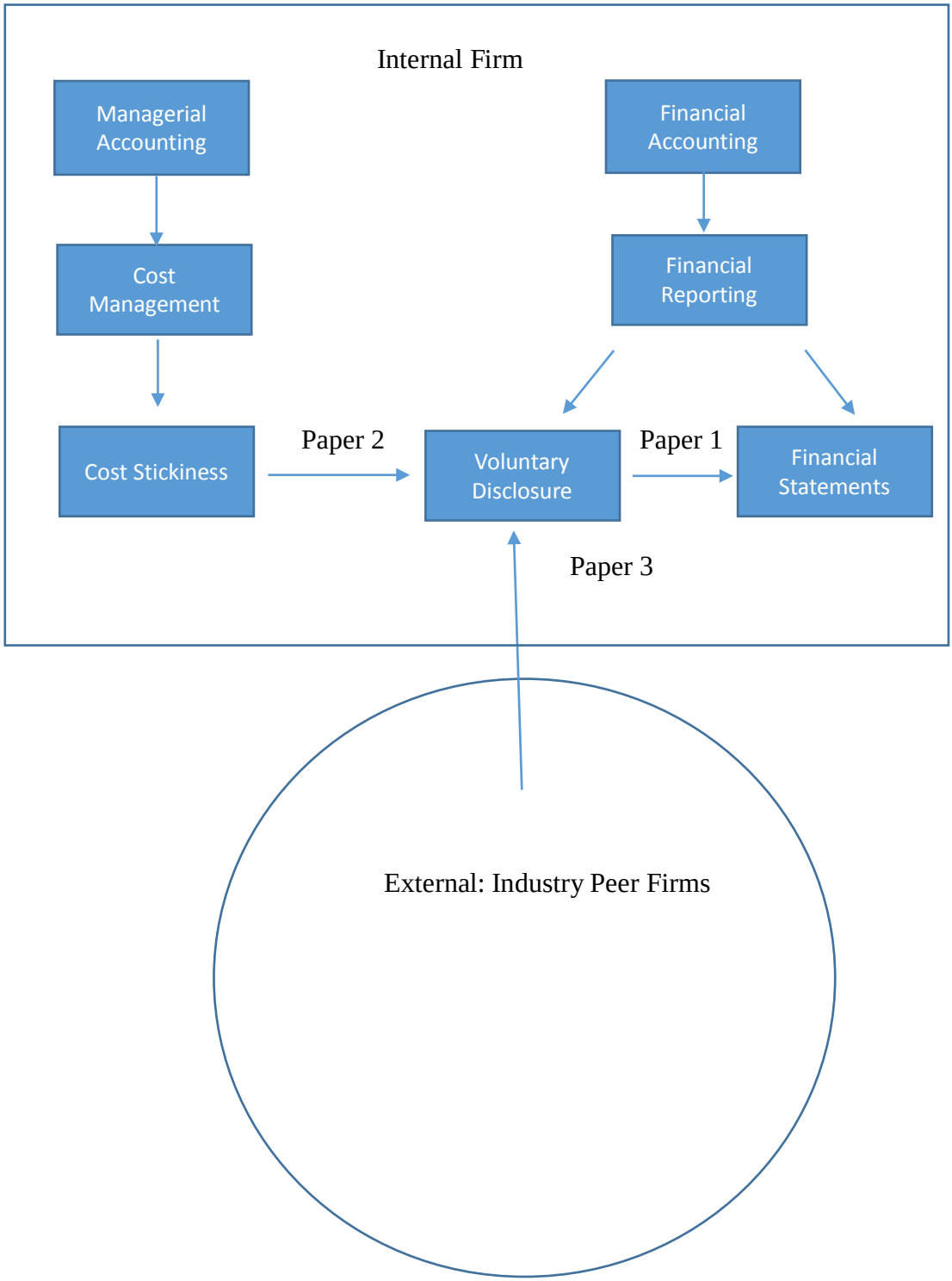

Figure 1: Overview Framework of the Dissertation

CHAPTER 2

CAN SUSTAINABILITY REPORTS SUBSTITUTE THE TRADITIONAL FINANCIAL STATEMENTS: EVIDENCE FROM DISCLOSURE QUALITY, EARNINGS QUALITY AND AUDIT FEE?

1. Introduction

The importance of an effective corporate communication with all stakeholders including shareholders has been extensively debated in the business literature in the aftermath of 2007-2009 global financial crisis. The key indicator of business value have shifted from accounting profits and stock market performance, formerly, to firm reputation and sustainability performance, currently. Therefore, the transparency and value-relevance of conventional financial reporting has been questioned in terms of its capability to satisfy increasing information needs of all stakeholders. Many doubt whether those traditional financial metrics derived from financial statements can appropriately capture firm's long-term value creation ability. In recent years, users of corporate reports are demanding more relevant financial and non-financial on key performance indicators and forward looking information above and beyond conventional financial statements. To satisfy the demands of information users and decision makers, companies are expected to not only increase their reporting transparency in conventional financial statements but also disclose more nonfinancial information related to firm long-term sustainability performance. In earlier years, sustainability reporting is limited to firm's performance related to green project or carbon emission control. Today, the sustainability reports are popular in worldwide and expanded to convey information related to every aspect of firm sustainability operation and performance. In this paper, I use the sustainability report compiled by Global Reporting Initiatives (GRI) to measure voluntary disclosure. A sustainability

report is a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. According to the Value of Sustainability Reporting of Ernst & Young published in 2014[1], firms implement the sustainability reporting as one of new communication methods to gain better reputation, meet the expectation of employees, improve access to capital, increase operation efficiency and reduce waste. The KPMG Survey of Corporate Responsibility Reporting 2013 suggests that more than 80 percent of reporting companies identify both business risks and commercial opportunities from the sustainability reports (KPMG, 2013).

Following this trend, till now, more than 40 countries' regulators are developing proposals or have updated disclosure requirements for firm sustainability reporting[2]. For example, in 2014 the Australia Stock Exchange (ASX) have developed a new version of nonfinancial information disclosure regulations to require listed companies to inform investors the environmental and social sustainability risk faced by firms and firms' related risk management strategies. European Commission developed the proposal for mandatory sustainability disclosure in 2013 and finally in April 15, 2014 has passed the regulation that companies with more than 500 employees must release sustainability report. The scope of this regulation includes approximately 6000 large companies and groups across European Union (EU Commission, 2014)[3].

[1] The Value of Sustainability Reporting by Ernst & Young is available at: http://www.ey.com/Publication/vwLUAssets/EY_-_Value_of_sustainability_reporting/$FILE/EY-Value-of-Sustainability-Reporting.pdf .

[2] According to the Report of Current Corporate Social Responsibility Disclosure Efforts by National Governments and Stock Exchanges by Initiative for Responsible Investment (IRI) at Harvard University.

[3] Data from website of European Commission.

According to GRI, 95% percent of the Global 250 issue sustainability reports. However, this new reporting channel has not yet obtained sufficient attention from accounting academic research. Jones (2007) finds that firms with a lower book-to-market ratio are more likely to disclose more detailed information about R&D activities. Dhaliwal et al. (2011) suggest that firms issuing corporate social (CSR) reports enjoy a lower cost of equity capital and attract more equity capital raising. Dhaliwal et al. (2012) suggest that CSR reports can effectively reduce information asymmetry through decreasing financial analysts' earnings forecast errors. In this paper, I examine the association between voluntary disclosure measured by sustainability report and the metrics, such as earnings quality and audit fee, derived from financial statements.

Results of prior research on the association between voluntary disclosure and earnings quality are inconclusive. For a long time, accounting research argues whether voluntary disclosure is a substitute or a complement to earnings quality. The former research suggests that more voluntary disclosures are substitutable to the lower earnings quality (Milgrom, 1981; Verrecchia, 1983; Sengupta, 1998; and Tasker, 1998). In contrast, the latter research suggests that more voluntary disclosures are complementary to the higher earnings quality (e.g., Dye, 1985; Jung and Kwon, 1988; Verrecchia, 1990; Penno, 1997; Francis et al., 2008). Moreover, recent papers argue whether management earnings forecast, a type of voluntary disclosure, can shift managers' attention from long-term performance to short-term earnings and lead to myopic behaviors, such as earnings management. Call et al. (2014) suggest firms issuing short-term management earnings forecast exhibit a better earnings quality and less earnings management. In contrast, Feng et al. (2012) and Koch et al. (2012) find that management earnings forecast is associated with a lower earnings quality and a

higher probability of earnings management. Moreover, Acito (2014) finds no statistical relation between quarterly management earnings forecast and the likelihood of earnings management. Acito suggests that guiding firms recognize large abnormal accruals to beat management forecasts but non-guiding firms recognize large abnormal accruals to beat financial analysts' forecasts. Furthermore, Moon (2014) suggests that management earnings forecast is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality. In conclusion, the controversial arguments in prior papers intrigue my interests in revisiting the association between voluntary sustainability disclosure and earnings quality.

Following Moon (2014), I classify earnings quality into two different perspectives, innate earnings quality and discretionary earnings quality. Innate earnings quality refers to earnings quality derived from firm innate traits and discretionary earnings quality refers to earnings quality which is not derived from firm innate traits. I conjecture that sustainability disclosure is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality due to following two reasons. First, an increasing number of companies and organizations want to make their operations sustainable and contribute to sustainable development, because sustainability reporting can help managers to measure, understand, and communicate firms' economic, environmental, social and governance performance. Hence sustainability disclosure can help managers plan and control firm operations and strategies and thus may improve the firm's innate earnings quality through meeting the firm's sustainable performance. Second, the sustainability report is a type of voluntary disclosure and its format, content and timing are all controlled and determined by managers. Moreover, currently most of sustainability reports are

not required to be verified by the independent third party. Hence sustainability disclosure provides managers with more discretion in communicating firms' inside information to outsiders. Therefore, the higher possibility of managerial opportunism caused by sustainability report tends to reduce the firm's discretionary earnings quality.

From these two aspects, I expect that sustainability reporting is positively associated with innate earnings quality (the supplementary relation) and negatively associated with discretionary earnings quality (the substitutable relation). Moreover, the association between voluntary disclosure and earnings quality depends on the quality of disclosure. Most of prior papers pay more attention to the quantity of voluntary disclosure instead of the quality. However, unclear and illogical disclosure without specific numeric description cannot satisfy the demands of accounting information users (Li, 2008; Lehavy et al. 2011). The inclusion of important key words based on reasonable framework is also an important indicator of disclosure quality, which can guide investors to make decisions (Li et al., 2013). Furthermore, the tone of disclosure also affects the usefulness of disclosure through influencing the perceptions and behaviors of investors and financial analysts (Kothari et al., 2009; Li et al., 2011). In conclusion, better quality of disclosure can increase the efficiency and effectiveness information communication, and thus firm will experience better performance in the operation and the capital market. Therefore, I conjecture that disclosure quality can significantly influence the relation between innate/discretionary earnings quality and sustainability disclosure.

After the discussion of benefit of sustainability disclosure, I also examine whether sustainability reports can substitute our traditional financial statements, because sustainability reports are advantageous in not only improving earnings quality

but also providing insight into long-term future of environmental, social and governance performance. I investigate this question by examining the relation between sustainability reports and audit fees. If sustainability reports can substitute traditional financial statements, accounting information users then will reduce the requirement of verification level on financial statements and thus auditors tend to charge lower audit fees.

I collect the data of sustainability disclosures from GRI database between 1999 and 2013. I use both matching group approach based on market value and industry benchmark and the OLS regression approach to test my hypotheses. Through both methods, I find that sustainability disclosure is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality. Moreover, through the DID test, I find that the disclosure quality, measured as the application level of GRI framework in preparing sustainability report, can strengthen the positive correlation between innate earnings quality and sustainability report and mitigate the negative correlation between discretionary earnings quality and sustainability report. In other words, when disclosure quality is high**,** the positive correlation between innate earnings quality and sustainability report is more pronounced and the negative correlation between discretionary earnings quality and sustainability report is less pronounced. Moreover, I find that sustainability report is positively associated with audit fees, which suggests that sustainability reports are complementary not substitutable to traditional financial statements. After releasing sustainability reports, accounting information users don't reduce the verification level required on financial statements, and thus auditors will charge higher audit fee premium because they view sustainability reports as higher litigation risk or more managers' discretion. However, this audit fee premium will reduce, if the

sustainability reports are with better quality. In conclusion, my results suggest that regulators should provide more guidance to help companies to release good-quality voluntary disclosures and companies should also governance and oversee their quality of voluntary disclosure.

Because prior research has not paid sufficient attention to sustainability reporting, I believe this paper can contribute accounting literature by filling the research gap. First, Paper 1 of my dissertation is different from most of prior papers which focus on financial disclosure, such as management earnings forecasts. I examine sustainability reporting which has been released by most of big companies across worldwide. Recently, more and more regulators are also considering updating the related regulations to encourage or mandatorily require companies to release sustainability reporting to increase transparence and usefulness of accounting information. Thus my paper has significant implications for both practitioners and regulators. Second, I suggest the importance role of disclosure quality which is neglected by most prior research. The results suggest disclosure quality is significantly correlated with the efficiency and effectiveness of information communication. Although both Global Reporting Initiatives (GRI) and Sustainability Accounting Standards Board (SASB) are continuously developing the guidance which provides the useful framework for firms to create sustainability reporting with high quality, I suggest that a more comprehensive and internationally recognized standard of disclosure quality need to be established and that regulators should encourage companies to follow that kind of disclosure quality standards to improve the reliability and comparability of sustainability reporting. Finally, the paper provides new evidence for the current accounting research debate. Following Moon (2014), I investigate the relation between earnings quality and voluntary disclosure through

classifying the earnings quality into innate and discretionary earnings quality. Through implementing the measures of different types of earnings quality, this paper provides new evidence for the controversial issue regarding the relation between earnings quality and voluntary disclosure and especially point outs that the disclosure quality plays a moderator role in this relation.

The remainder of the paper is organized as follows: I review the related literature in the section 2 and develop the theory-driven hypotheses in the section 3. Then I discuss the sample selection and descriptive statistics in the section 4. Detailed research design, including measurements and models, are described in the section 5. After that, I present the empirical results and additional tests in the section 6 and section 7 respectively. Finally, I present the conclusion in section 8.

2. Literature Review

2.1 Nonfinancial Disclosure

Prior research has once paid more attention to financial disclosure instead of nonfinancial disclosure, because the limited access to database. Robb et al. (2001) is one of the earliest studies which examine firms' strategies of voluntary nonfinancial disclosure. The authors find that larger firms and firms with a global focus tend to voluntarily disclose more nonfinancial information. Vanstraelen et al. (2003) investigate the benefits of nonfinancial disclosure and find that the quantity of nonfinancial disclosure is negatively correlated with the errors and dispersions of financial analysts' earnings forecasts. Both Robb et al. (2001) and Vanstraelen et al. (2003) construct their variables of nonfinancial disclosure by self-counting the nonfinancial information conveyed in financial annual reports. Another stream of nonfinancial disclosure study is to investigate the MD&A. Although MD&A contains financial information related to past earnings and future earnings forecast, it also

provides investors with supplementary nonfinancial information related to management strategies and planning. Prior research suggest MD&A is determined by firm specific characteristics and managers' strategies (Clarkson et al., 1994; Clarkson et al., 1999) and can reduce information asymmetry and help information users make decisions (Barron et al., 1999; Cole and Jones, 2004;Sun, 2010; Wheeler et al., 2014). Although MD&A can provide investors with certain nonfinancial information and perspective information, regulators are still concerned about the informativeness of MD&A. Brown and Tucker (2011) find that the frequency of MD&A modification has declined in the past decade and the price reaction to MD&A modification scores has also weakened although the length of MD&A has become longer. Because the usefulness of MD&A has reduced, to satisfy the demands of information users, managers are releasing more and more standalone reports related to firm nonfinancial information, such as environmental reports, corporate social responsibility (CSR) reports and sustainability reports. However, there is a long-term argument surrounding the benefits and costs of these types of standalone nonfinancial reports. Especially many argue that the increased environmental and CSR reporting can increase the litigation risk and thus reduce economic performance (socio-political theories). Al-Tuwaijri et al. (2004) develop a simultaneous equation approach and find that environmental disclosure is positively correlated with both environmental performance and economics performance. Clarkson et al. (2008) revisit the relation between environmental performance and environmental disclosure and also reject the socio-political theories. Consistently, Dhaliwal et al. (2011) and Dhaliwal et al. (2012) respectively provide USA and international evidence on the informativeness of standalone CSR report by showing an information asymmetry reduction after CSR

reporting. In conclusion, prior research suggests that nonfinancial disclosure is informative and can benefit the firm in long-run.

2.2 Voluntary Disclosure and Earnings Quality

Prior research has once debated the relation between voluntary disclosure and earnings quality for a long-time period. Earlier papers (Milgrom, 1981; Verrecchia, 1983; Sengupta, 1998; Tasker, 1998) suggest that voluntary disclosure is associated with worse earnings quality (substitutive relation). For example, Milgrom (1981) examines how market interprets the good news and bad news in the information economy. By building the analytical models, the author finds manager will fully disclose at every sequential equilibrium, because investors hold skeptical view of any information the manager conceals. Verrecchia (1983) finds a similar result that the firm tries to disclose more information, because otherwise the market will interpret the silence as bad news and then discount the firm's value. Sengupta (1998) concludes the disclosure is more important where there is greater market uncertainty about the firm. This stream of research considers earnings quality as exogenous and usually uses information asymmetry to measure the earnings quality. They conclude firm with lower earnings quality (higher information asymmetry) will be more likely to disclose private information.

However, some other works show there is an endogenous relation between disclosure and earnings quality (Dye, 1985; Waymire, 1985; Jung and Kwon, 1988; Verrecchia, 1990; Francis et al., 2008). This research stream indicates that firm with higher earnings quality tends to disclose more information (the complementary relation). For example, using the model of voluntary disclosure provided by Verrecchia (1983), Verrecchia (1990) uses the precision of information observed by manager to measure information quality, instead of information asymmetry, and then

finds that the disclosure is positively related to the quality of private information. Francis et al. (2008) re-examine this issue by using the self-constructed measurement to capture voluntary disclosure in the 10-Ks and using the accruals quality, earnings variability and absolute abnormal accruals to measure earnings quality. Their empirical results suggest there is a positive relation between voluntary disclosure and earnings quality. Thus their work supports the complementary relation that firms with higher earnings quality tend to release more voluntary disclosures.

However, the relation between voluntary disclosure and earnings quality still remains inconclusive. The analytical research in Penno (1997) concludes that the relation between information quality and voluntary disclosure depends on how information quality influences the probability of being informed. In some region of the function, as the probability of being informed increases, the author finds the reduction in information quality makes disclosure less likely. However, if higher information quality significantly decreases the probability of being informed, the author finds disclosure may have negative relation with information quality. Thus the author concludes the relation between earnings quality and disclosure depends on the probability that manager obtains information. Moreover, when Francis et al. (2008) use management forecast behavior and conference call activity to measure voluntary disclosure, they find weak evidence of a substitutive relation instead of complementary relation. Thus the measurements of voluntary disclosure may matter.

Even if using the same measurement to capture voluntary disclosure, prior research has controversial conclusion regarding the relation between management earnings forecast and earnings quality. McKinsey (2006) reports: “the practice of guidance has become ‘misguided’ as there is an excessive focus on short-term ‘number games’ rather than long-term firm health and future business condition.”

Moreover, both Proposals by CFA Institute (CFA Institute 2006, 2) and U.S. Chamber of Commerce (2007) suggest that management earnings forecasts should be discontinued. Many executives have viewed MEF as impractical and irresponsible given the current financial crisis and market volatility (Corporate Counsel report, 2010). Therefore, many people express concerns whether management earnings forecast will shift managers' attention from long-term sustainable performance to short-term earnings and thus will encourage myopic earnings management. Consistent with this concern, Feng et al. (2011) suggest that firms manipulating earnings strategically use management earnings forecast to conceal their misstatements and to delay the detection of those misstatements. Koch et al. (2012) argue that the probability of management earnings forecast is inversely correlated with constraints on future earnings management and thus guiding firms tend to manage their earnings to meet their own forecasts. In contrast, Acito (2014) find that both guiding firms and non-guiding firms tend to conduct earnings management and thus there is no statistic relation between management earnings forecast and earnings quality. Moreover, Call et al. (2014) find strong and consistent evidence that firms releasing management earnings forecasts exhibit better earnings quality instead of worse earnings quality. Recently, Moon (2014) provides evidence for both complementary and substitutive relation by classifying the earnings quality into innate and discretionary earnings quality. The author finds that management earnings forecast is positively correlated with innate earnings quality and negatively correlated with accrual earnings quality.

In conclusion, the usefulness of nonfinancial disclosure is incompletely answered and the relation between voluntary disclosure and earnings quality remains controversial. This inspires me to investigate the relations among sustainability disclosure, sustainability disclosure quality and earnings quality in this paper.

3. Hypotheses Development

3.1 Sustainability Disclosure and Earnings Quality

Different from financial disclosure, such as management earnings forecast, sustainability reporting is a type of nonfinancial disclosure. Sustainability reporting provides information related to firm operations structure, strategies, suppliers, customers, production, employees, and research and the like, and thus introduces the firm's business philosophy. In contrast, financial statements use only numbers to describe firm accounting profits. Therefore, the sustainability reporting can inform not only outsiders but also managers of the firm's potential opportunities and problems. The goal of sustainability reporting is to help managers design strategies for firm future operation and help accounting information users to estimate the firm's long-term value. Because sustainability disclosure comprehensively reviews and forecasts the firm financial and nonfinancial performance and focuses on long-term sustainable performance, this will also improve the firms' innate traits in every aspect. Therefore, I expect that innate earnings quality derived from firm purchases, sales and capitalization will increase with the release of sustainability disclosure.

However, the release of sustainability disclosure also provides more discretion for managers. As a type of voluntary disclosure, managers can control and determine the format, content, tone and disclosing timing of sustainability report. Because of more managerial discretion, managers have the incentive to choose the partial disclosure instead of full disclosure. Specifically, through sustainability disclosure, managers can deliberately leak the information they want investors and analysts to know and withhold the information they don't want investors and analysts to know. Kothari et al. (2009) provide evidence that managers tend to immediately disclose good news and delay the release of bad news to reduce the negative reaction from

stock market caused by bad news. Moreover, prior research finds that managers may disclose earnings forecasts to adjust market expectation towards beatable earnings target (Baik and Jiang, 2006; Cotter et al., 2006). Because the sustainability disclosure will encourage managerial opportunism, I expect that discretionary earnings quality will decrease due to more managerial discretion, when the firm releases the sustainability report. In conclusion, based on the two reasons mentioned above, I develop the hypotheses as following:

H1a: Sustainability reporting is positively associated with innate earnings quality.

H1b: Sustainability reporting is negatively associated with discretionary earnings quality.

3.2 Disclosure Quality and Earnings Quality

Because sustainability reporting is a type of voluntary disclosure, managers have more discretion to determine the content, volume and timing of disclosure. Prior papers suggest that managers are myopically motivated to withhold certain information or delay certain disclosure to achieve strategical purposes (Patell and Wolfson, 1982; Baginski et al.,1995; Hirshleifer and Teoh,2003; Hirshleifer et al.,2009) .Moreover, voluntary disclosure may also be unconsciously or intentionally biased by managers. Therefore, the usefulness of sustainability reporting is directly influenced by the disclosure quality. The quality of disclosure includes the accuracy, transparency, logicality of disclosure. First, accuracy of disclosure suggests that there is no significant bias in the sustainability reporting. Coram et al. (2009) and Simnett et al. (2009) find that assurance is an important indicator of the credibility of sustainability reporting. Second, transparency of disclosure is related to the texture analysis of disclosure content, and prior paper suggests the tone and readability of disclosure are indicators of disclosure quality (Li, 2008; Kothari et al. 2009; Li, 2010;

Lehavy et al. 2011). For example, lower performed firms tend to use reports which are hard to read to conceal the potential financial and operational problems and to mislead the market (Li, 2008; Lehavy et al. 2011). Kothari et al. (2009) and Li (2010) find that the appropriate tone of disclosure can significantly influence the usefulness of disclosure through affecting users' behaviors and perceptions. Finally, the logicality of disclosure indicates that the disclosure is constructed based on logical framework and contains the relevant and complete information needed by users. For example, Li et al. (2013) suggest that appropriate key words contained in the report can increase the usefulness of disclosure. In conclusion, disclosure quality is associated with the effectiveness and efficiency of information communication, and firms have propensity to conceal their financial or operating problems through releasing voluntary disclosures with low quality. Sustainability reporting with good quality indicates that managers have a greater propensity to reduce information asymmetry and reduce myopic behaviors to achieve long-term reputation and sustainable performance.

As mentioned above, prior papers have controversial conclusions of the relation between sustainability reporting and earnings quality. One potential reason is that prior papers considered the quantity of disclosure but neglected the quality of disclosure. In fact, the accuracy, readability, tone and logicality of disclosure can significantly influence how investors perceive and implement related information contained in the sustainability reporting. Therefore, the relation between sustainability reporting and earnings quality is influenced by disclosure quality. Specifically, better disclosure quality can further improve firm operations derived from preparing the sustainability disclosure and thus can strengthen the positive relation between sustainability disclosure and innate earnings quality. Moreover, the higher level of

requirements for disclosure quality can limit managerial discretion in preparing sustainability disclosure and thus will alleviate the negative relation between sustainability disclosure and discretionary earnings quality. Therefore, I develop following hypotheses:

H2a: The positive relation between sustainability reporting and innate earnings quality is more (less) pronounced for firms with better (worse) disclosure quality.

H2b: The negative relation between sustainability reporting and discretionary earnings quality is less (more) pronounced for firms with better (worse) disclosure quality.

3.3 Sustainability Disclosure, Disclosure Quality and Audit Fees

There is a trend that more and more firms are releasing sustainability reports which focus on firm long-term value. The European Commission also has passed the law which requires big companies to release their financial reports based on sustainability framework. Because sustainability reports provide a comprehensive illustration of firm future financial and nonfinancial performance, I are considering in the future whether sustainability reports can substitute the traditional financial statements which only focus on short-term financial performance. Following Ball et al. (2012), I examine this issue through the confirmation hypothesis. If sustainability reports can substitute the traditional financial statements, accounting information investors will require a lower level of verification on financial statements, because the usefulness of audited financial statements decreases significantly. The lower level of verification on financial statements will also reduce the resources and skills needed for auditing, and thus the audit fees will decrease. In contrast, if sustainability reports cannot substitute the traditional financial statements and the level of verification on financial statements required by information users doesn’t change, the audit fees will

not change after the release of sustainability reports. However, there is also a possibility that information users still need the high level of verification on financial statements and auditors view the release of sustainability reports as higher litigation risk or more managers' discretion. Then audit fees may increase, because auditors need to devote additional resources into reading the information contained in the sustainability report to ensure that the major content of sustainability report is consistent with the financial statements. Because all the three explanations are plausible, I don't conjecture a specific relation between audit fees and sustainability reports. In contrast, I construct a null hypothesis:

H3: There is no correlation between sustainability disclosure and audit fees.

As mentioned above, disclosure quality plays a significant role in explaining the effectiveness and efficiency of information communication, and thus I believe the disclosure quality can influence the relation between sustainability disclosure and audit fees. If the sustainability reports can substitute audited financial statements and the sustainability reports are with good quality, then sustainability disclosure with 100 percent of assurance will make the third-party assurance, such as audit service, become meaningless and thus the audit fees will become zero. If the sustainability reports are complement to audited financial statements, the good-quality sustainability reports can reduce the litigation risk and thus reduce the audit fees. Because both the two explanations are plausible, I don't conjecture the specific effect of disclosure quality on the relation between sustainability disclosure and audit fees, and thus develop a null hypothesis:

H4: Disclosure quality is not the factor which may influence the relation between sustainability disclosure and audit fees.

4. Sample Selection

I collect the data of sustainability reporting from database of Global Reporting Initiative (GRI), a not-for-profit organization which "promotes the use of sustainability reporting as a way for organizations to become more sustainable and contribute to sustainable development". GRI provides the list of organizations releasing sustainability reports since 1999 and also evaluate the quality of sustainability reports based on GRI Sustainability Reporting Framework. GRI provides the information of sustainability reports released by organizations from all over the world. However, in this paper I only use the data of sustainability reports released by USA corporates. I select GRI database over other corporate sustainability report databases, because of following reasons. First, GRI is a USA not-for-profit organization found in 1997 and is supported by the Coalition for Environmentally Responsible Economies and the Tellus Institute. Thus GRI has longer history and better technique support compared to other organizations which also collect the data of sustainability reports. Second, GRI has established its own frameworks and guidelines to regulate the sustainability reports and has updated the guidelines for four versions. These guidelines enjoy the synergies with the guidance of the International Finance Corporation, the international Organization for Standardization's ISO 26000, the United Nations Conference on Trade and Development and the Earth Charter Initiative. Thus the high quality of GRI guidelines can improve the effectiveness and efficiency of sustainability report database established by the GRI. Thirdly, the GRI has a very strong network structure through cooperating with government bodies (such as Swedish International Development Organization, the Swiss-based State Secretariat for Economic Affairs, the UK department for International Development, and the Dutch Ministry of Foreign Affairs) and building partnership with various

international organizations (such as the Organization for Economic Co-operation and Development, the United Nations Environment Programme, and the United Nations Global Compact). The strong network and these strategic partners can help GRI to build more comprehensive database and thus reduce the possibility of selection bias. Moreover, the GRI has established its board of directors, governance bodies, secretariat, government advisory group and organizational stakeholders. This well-established organizational structure can improve the quality of service and database provided by GRI. Finally, the GRI receives the grants from nearly 600 organizations from more than 60 countries (including 32 developing countries). Some examples of donators include the European Commission, Bill and Melinda Gates Foundation, the United States Environment Protection Agency, UN Foundation, World Bank and governmental bodies from Germany and Norway. Because the GRI receives grants from a diverse range of organizations, this can guarantee the independence of the GRI operations and thus improve the quality of GRI database. In conclusion, the rigorous governance, various grants, strategic partnership with governance bodies, and the self-established sustainability report guideline guarantee the quality of GRI database and thus provide better data source of sustainability reports.

I also collect fundamental variables and stock market performance from the COMPUSTAT and CRSP database respectively. Audit fees and auditor information are collected from AuditAnalytics. After database mergers, my final sample of OLS regressions without missing values includes 1,858 firm-years between 1999 and 2013, including 929 firm-year with sustainability disclosures and 929 matched firm-year without sustainability disclosures. Through matching procedure, the criticism regarding the representativeness of disclosure data may be lessened, because the disclosing firms occupy only a small portion of the original sample. When I test the

effect of sustainability disclosure on the audit fees, the sample size reduces to 1,570 without missing values. Finally, when I include the variables of disclosure quality into the test, the sample size also correspondingly reduces significantly.

Moreover, to test the effect of disclosure quality on the relation between voluntary disclosure and earnings quality/audit fees, I need to construct the interaction term between disclosure quantity and disclosure quality. However, due to database limit, the disclosure quantity is the dummy variable and thus the interaction term cannot be generated, because the sample firm will have no available data of disclosure quality if its disclosure quantity is zero. To solve this problem, I also employ the Difference-in-Difference (DID) tests for my matched sample. DID is a more attractive technique when I want to explain a causal relation and I am not access to the data of certain control variables. In this paper, I construct the matched group based on both firm size and firm performance. Following Bath et al. (2012), I first match the firms which disclose at least one sustainability report according to GRI database (Disclosing Firms) with firms which never disclose sustainability reports according to GRI database (Non-disclosing Firms) in the same industry (two-digit SIC code). Then I match the disclosing firms and those non-disclosing firms based on market value to mitigate cost of capital and other economic differences un-attributable to sustainability disclosure. I select the matched non-disclosing firms with market value which is the nearest to disclosing firms' market value. I believe my matching procedure based on market value and industry can rule out the influences of many other factors and can attribute the changes in earnings quality/audit fees to the release of sustainability reports.

5. Research Design

5.1 Sustainability disclosure and disclosure quality

Following Dhaliwal et al. (2011, 2012), I employ a dummy variable to proxy the firms' sustainability reporting behaviors. Disclose is equal to 1 if the firm releases a sustainability report in the sample year and the report has been recorded in GRI database. Otherwise Disclose is equal to zero.

To measure the quality of sustainability disclosure, I construct two measurements. First, I determine whether the sustainability report is produced based on GRI Framework. According to introduction on the website of GRI, "GRI's mission is to make sustainability reporting standard practice for all companies and organizations. Its Framework is a reporting system that provides metrics and methods for measuring and reporting sustainability-related impacts and performance." The GRI Framework includes guidelines, sector guidance and other resources which help organizations release a systematical disclosure of their governance approach and of their environmental, social and economic performance and also improve the usefulness of disclosure which can be easily used and understood by shareholders, potential investors, financial analysts and experts, labor, civil society and government. Till 2014, GRI has already released several versions of sustainability reporting frameworks, including G1, G2, G3, G3, and G4. The G1 is the earliest version and implemented by sustainability reports released in early 21th century. G4 is the latest version of GRI Framework and employed by most recent sustainability reports. The GRI database evaluates whether the sustainability reports follow the GRI Framework and classifies the sustainability reports into seven ranks, including following G1, following G2, following G3, following G3.1, following G4, following GRI only referenced, and non-following GRI. The first disclosure quality variable (DIS_Q1) is

equal to 1 if the firms release sustainability reports following GRI Framework G1, G2, G3, G3.1 or G4. The variable (DIS_Q1) is equal to 0 if the firms release sustainability reports which are not based on any GRI Framework or which mention GRI Framework as only reference. I believe those sustainability reports following GRI Frameworks have better disclosure quality than those reports which don't follow any GRI Framework.

The second measurement of disclosure quality (DIS_Q2) is how disclosing firms apply GRI Frameworks in preparing their sustainability reports. GRI classifies the sustainability reports' application level of GRI Frameworks into 11 ranks. I give corresponding scores to each firm based on their application level. I respectively give 1 to 9 scores to each firm with application level as "Undeclared", "Reference Only", "In Accordance" or "In accordance – Core", "Content Index Only", "C", "C+", "B", "B+", "A" and "A+". Higher scores indicate better application level of GRI Framework and thus better disclosure quality.

5.2 Earnings Quality

I employ modified Dechow and Dichev (2002) approach as the measurement of earnings quality. Following McNichols (2002), Dechow and Dichev (2002) and Francis et al. (2004), I estimate the following cross-sectional regression for each firm-year:

$$\frac{TCA_t}{Assets_t} = \phi_0 + \phi_1 \frac{CFO_{t-1}}{Assets_t} + \phi_2 \frac{CFO_t}{Assets_t} + \phi_3 \frac{CFO_{t+1}}{Assets_t} + \phi_4 \frac{\Delta S_t}{Assets_t} + \phi_5 \frac{PPE_t}{Assets_t} + \varepsilon_1 \quad (1)$$

where TCA_t is the total current accrual in year t. $Assets_t$ is the average total assets in year t and year t-1. CFO_{t-1}, CFO_t, and CFO_{t+1} are respectively cash flow from year

t-1, t and t+1, measured as total accruals minus net income before extraordinary items and discontinued operations. I obtained residuals from above regression (1) for each firm and each year. The earnings quality (EQ) is measured as the standard deviation of the residuals during the 5-year period prior to the year t.

To investigate the controversial augments regarding the relation between earnings quality and voluntary disclosure, this paper also distinguishes the innate and discretionary earnings quality. Following Moon (2014), the innate (discretionary) earnings quality refers the degree of estimation error attributable (not attributable) to the inherent firm trait. Therefore, innate earnings quality is associated with the inherent operating uncertainty, such as firms' cash flow or sales volatility. In contrast, discretionary earnings quality reflects the management discretionary behaviors. Therefore, the innate earnings quality (IEQ) is the predicted value and the discretionary earnings quality (DEQ) is the residual from the equation (2) developed by Moon (2014).

$$EQ = \beta_o + \beta_1 SIZE + \beta_2 CFVOL + \beta_3 SALEVOL + \beta_4 OPCYCLE + \beta_5 NEG + \beta_6 INT + \beta_7 INTDUM + \beta_8 CAP + \varepsilon \quad (2)$$

This equation regresses of the earnings quality on inherent firm traits, including firm size (SIZE) defined as the natural logarithm of total assets, cash flow volatility (CFVOL), sales volatility (SALEVOL), operating cycle (OPCYCLE) defined as the natural logarithm of operating cycle, the frequency of negative earnings realizations during the previous five years (NEG), intangible assets scaled by total

assets [4](INT), and capital expenditures scaled by total assets (CAP). Specifically, CFVOL (SALEVOL) is the standard deviation of cash flows (sales) scaled by total assets over the previous five year window. I also include a dummy variable (INTDUM), if research and development expenditure or advertising expenditure is the missing value. To run the regression of equation 2, I winsorize all variables based on the top and bottom 1 percentile level, except dummy variables. Following Moon (2014), I also implement the BOX-COX transformation method to improve the linear fit of the Model 2. Finally, I multiply EQ, IEQ and DEQ by -1 except in the regression of Equation 2 and thus higher value of EQ, IEQ and DEQ is associational with better quality.

I also implement several control variables associated with the costs of accrual earnings managements. First, following Zang (2012), I use dummy variable, BIG8, to proxy the quality of auditors. I believe BIG8 auditors are access to more resources and better trainings and thus are associated with lower possibility of accrual earnings managements. Second, the flexibility of firms' accounting systems also influences the accruals level. Following Barton and Simko (2002), I use net operating assets at the beginning year (NOA_{t-1}) to proxy managers' accounting choice. If firms have more net operating assets at the beginning year, the firms have less pressure in accruals manipulations and thus have better earnings quality. Following Zang (2012), I measure NOA that is equal to 1 if firm net operating assets at the beginning year scaled by beginning sales are above the median of corresponding industry's net operating assets; zero otherwise. I also use the firm operating cycle (Cycle) to measure the flexibility of firms' accounting system. Firms with longer operating cycle

[4] Following Moon (2014), intangible assets are measured as the sum of R&D expenditures and advertisement expenditures, and missing values are set to zero.

in accounts receivables and inventories will have more flexibility in accruals management and thus have higher likelihood of lower earnings quality. I also include natural logarithm of total assets (SIZE), book-to-market ratio at the beginning year (BTM), return on assets (ROA), current assets to total assets ratio (Current) and leverage ratio (Leverage) to control firm characteristics. I control year fixed effect for macro economy condition and Fama-French 48 industry fixed effect for industry tradition. The standard errors of regressions are adjusted for firm-level clustering. To test the hypothesis 1 and hypothesis 2, I construct following equations:

$$EQ = \alpha_0 + \alpha_1 \text{Disclosure} + \alpha_2 \text{BIG8} + \alpha_3 \text{NOA} + \alpha_4 \text{Cycle} + \alpha_5 \text{ROA} + \alpha_6 \text{SIZE} + \alpha_7 * \text{BTM} + \alpha_8 \text{Current} + \alpha_9 \text{Leverage} + \alpha_{10} \text{Year} + \alpha_{11} \text{Industry} + \varepsilon_1 \quad (3)$$

$$EQ = \alpha_0 + \alpha_1 * \text{Disclosure\_Quality} + \alpha_2 * \text{BIG8} + \alpha_3 * \text{NOA} + \alpha_4 * \text{Cycle} + \alpha_5 * \text{ROA} + \alpha_6 * \text{SIZE} + \alpha_7 * \text{BTM} + \alpha_8 * \text{Current} + \alpha_9 * \text{Leverage} + \alpha_{10} * \text{Year} + \alpha_{11} * \text{Industry} + \varepsilon_1 \quad (4)$$

where EQ refers alternatively to innate earnings quality (IEQ) and discretionary earnings quality (DEQ). Disclosure_Quality refers alternatively to whether firms prepare sustainability reports following the GRI Framework (DIS_Q1) or the application level of GRI Framework (DIS_Q2).

5.3Audit Fees

Audit fees are collected from AuditAnalytics Database. I measure audit fees (Audit_Fee) as the natural logarithm of total audit fees in the sample year. Following Ball et al. (2012), I employ several variables to control the audit complexity and audit risk which may influence the total audit fees. First, I use the total accruals scaled by

total assets (ACCR), the current assets scaled by total assets (Current), and the number of business segments (Segment) to control the audit risk. For audit risk, I control reporting lag, which is the time lag between earnings announcement date and financial statement date (Report_Lag), firm performance level measured as ROA, firm liability ratio which is the total liabilities scaled by total assets (Leverage), and dummy variable (Loss) if the firm experiences a negative net income during the sample year. Prior research suggests that firm size is positively correlated with audit fees, and I use the natural logarithm of total assets to proxy firm size. Finally, I construct a dummy variable (DEC) which equals to 1 if the firm has a December fiscal year end to control for audit cost during peak season. Both year fixed effect and industry fixed effects are controlled. I adjust the standard errors for firm-level clustering. Therefore, I construct following regressions:

$$Audit\_Fee = \alpha_0 + \alpha_1 * \text{Disclosure} + \alpha_2 * \text{ACCR} + \alpha_3 * \text{Current} + \alpha_4 * \text{Segment} + \alpha_5 * \text{DEC} + \alpha_6 * \text{Report\_Lag} + \alpha_7 * \text{SIZE} + \alpha_8 * \text{ROA} + \alpha_9 * \text{Leverage} + \alpha_{10} * \text{Loss} + \alpha_{11} * \text{Year} + \alpha_{12} * \text{Industry} + \varepsilon \quad (5)$$

$$Audit\_Fee = \alpha_0 + \alpha_1 * \text{Disclosure\_Quality} + \alpha_2 * \text{ACCR} + \alpha_3 * \text{Current} + \alpha_4 * \text{Segment} + \alpha_5 * \text{DEC} + \alpha_6 * \text{Report\_Lag} + \alpha_7 * \text{SIZE} + \alpha_8 * \text{ROA} + \alpha_9 * \text{Leverage} + \alpha_{10} * \text{Loss} + \alpha_{11} * \text{Year} + \alpha_{12} * \text{Industry} + \varepsilon \quad (6)$$

6. Empirical Results

6.1 Matching Group Procedure

6.1.1 Descriptive Statistics and Pearson Correlation

Table 1 displays the descriptive statistics and Pearson correlation for the DID matching group sample. The Panel A provides the descriptive statistics for the four variables examined in the DID test, including earnings quality (EQ), innate earnings quality (IEQ), discretionary earnings quality (DEQ) and audit fees (Audit_Fee). Panel B displays the Pearson correlation among the different components of earnings quality and the audit fees. I find that total earnings quality is significantly and positively correlated with either innate earnings quality or discretionary earnings quality. Consistent with Moon (2014), I find that innate earnings quality and discretionary earnings quality are not significantly and highly correlated to each other. This suggests that my measurements of innate earnings quality and discretionary earnings quality are valid, because the independent variable, IEQ, is not correlated with the residual, DEQ, in the Equation 2. Finally, I find that innate earnings quality is highly positively correlated with audit fees. However, I find that higher discretionary earnings quality is associated with slightly lower audit fees. Panel C displays the regression results of Equation 2 after the BOX-SOX transformation. As mentioned in Section 5, the innate earning quality and discretionary earnings quality are respectively the predicted value and the residual obtained from the Equation 2. My regression results are consistent with prior research, and I find that firm size, operating cycle and capital expenditure ratio are significantly and negatively correlated with total earnings quality and that cash flow volatility, sales volatility, frequency of negative earnings and intangible assets ratio are significantly and

positively correlated with total earnings quality. This suggests my measurements of different components of earnings quality are valid.

6.1.2 Earnings quality and sustainability disclosure

Table 2 illustrates the results of matching group procedure for hypothesis 1 and hypothesis 2. In Panel A, I employ a matching group procedure by matching 1,050 firm-years which release sustainability reports (disclosing firms) and corresponding firms which don't release any sustainability reports (non-disclosing firms) during sample year 1999 to 2013, based on both market value and industry benchmark. For innate earnings quality, I find that the disclosing firms' mean value (Mean $IEQ_{disclosing}$ = 4.4268) is higher than the non-disclosing firms' mean value (Mean $IEQ_{nondisclosing}$ = 4.167) and the difference is significant at the 1 percent level. For discretionary earnings quality, I find that the disclosing firms' mean value (Mean $DEQ_{disclosing}$ = -0.2337) is lower than the matched non-disclosing firms' mean value (Mean $DEQ_{nondisclosing}$ = -0.0999) and the difference is significant at the 5 percent level. Therefore, the sustainability disclosure is associated with better innate earnings quality and in contrast is associated with worse discretionary earnings quality.

Table 1: Descriptive Statistics and Pearson Correlation

Panel A: Descriptive Statistics

Variable	Mean	Median	Std Dev	25th Pctl	75th Pctl
EQ	3.6282589	3.4870723	2.008519	2.1243557	4.9081508
IEQ	3.8441604	3.8969479	1.119956	3.0103912	4.6625982
DEQ	-0.21625	-0.2278504	1.675275	-1.295371	0.8686067
LnFee	13.27346	13.31214	1.535106	12.119027	14.344549

Panel B: Pearson Correlation

	EQ	IEQ	DEQ	LnFee
EQ	1			
IEQ	**0.53439**			
DEQ	**0.82669**	-0.0303		
LnFee	**0.19159**	**0.47742**	**-0.08821**	1

Panel C: Validity Test of Measurements of Earnings Quality

Variables	Coefficient	P-value
Intercept	-2.95518	<.0001
SIZE	-0.427254	<.0001
CFVOL	0.004501	<.0001
SALEVOL	0.001865	<.0001
OPCYCLE	-0.000548	0.0951
NEG	0.654011	<.0001
INT	3.308889	<.0001
INTDUM	-0.16281	0.2477
CAP	-15.82432	<.0001
Adjusted R-Square	0.3144	

Table 1 describes the descriptive statistics and Pearson correlation for variables examined in the DID test. Panel A provides the descriptive statistics. Panel B displays the Pearson correlation among the variables examined in the DID test. Bold figures indicate the correlation is significant at less than 5 percent level. Panel C tests the validity of measurements of earnings quality (EQ). The innate earnings quality (IEQ) is the predicted value of the regression and the discretionary earnings quality (DEQ) is the residual obtained from the regression. I use the BOX-COX transformation method to improve the linear fit of model, following Moon (2014).

Table 2: Earnings Quality for Disclosing and Nondisclosing Firms

	IEQ	DEQ
Panel A: Disclosing versus Nondisclosing firms		
Disclosing Firms (N=1050)	4.4268	-0.2337
Nondisclosing Firms (N=1050)	4.167	-0.0999
Disclosing - Nondisclosing	0.2599***	-0.1338**
Panel B: Following GRI Guidance versus Non-Following GRI Guidance		
Following Firms (N=894)		
Disclosing Firms	4.4072	-0.3313
Non-disclosing Firms	4.1603	-0.1631
Disclosing - Nondisclosing	0.2468***	-0.1681***
Non-Following Firms (N=156)		
Disclosing Firms	4.5248	-0.3018
Non-disclosing Firms	4.2021	-0.2238
Disclosing - Nondisclosing	0.3226***	-0.078
Following - Nonfollowing	-0.0758	-0.0901
Panel C: High versus Low GRI Framework Application level		
High GRI Framework Application Level (N=495)		
Disclosing Firms	4.4242	-0.2545
Nondisclosing Firms	4.1768	-0.2124
Disclosing - Nondisclosing	0.2474***	-0.0421
Low GRI Framework Application Level (N=151)		
Disclosing Firms	4.2196	-0.8306
Nondisclosing Firms	4.1703	-0.6646
Disclosing - Nondisclosing	0.0493	-0.166***
High - Low Application Level	0.1981***	0.1239**

Table 2 presents the DID test for the relation betweeen earnings quality and sustainability report. The first (second) column tests the difference in innate (discretionary) earnings quality between the firms with sustainability report and firms without sustainability report. Panel B and C examine whether disclosure quality can influence the relation between earnings quality and sustainability report and the disclosure quality is respectively measured as the dummy variable whether the sustainability report is prepared based on GRI framework and the application level of GRI framework in preparing the sustainability report. The *, **, and *** repsectively indicate the difference is significant at 10, 5, and 1 percent level.

My results are consistent with Moon (2014) which suggests that management earnings forecasts are positively (negatively) correlated with innate (discretionary) earnings quality. When firms voluntarily disclose sustainability reports which include both financial and nonfinancial information, managers will review and plan the firms operating, financing and investing activities based on sustainable benchmark and thus they will be more familiar with the every aspect of running the firms. Because the innate earnings quality is derived from firm inherent operations, the disclosure of sustainability report will also improve the firm's innate earnings quality. However, the voluntary sustainability disclosure will also provide more discretion for management opportunism, especially when current laws have not yet required the voluntary sustainability reports to be verified by the auditors. Therefore, the discretionary earnings quality will be contaminated when managers have more discretion in preparing the sustainability report to conceal or partially release the firm inside information. In conclusion, voluntary sustainability disclosure has the different effects on the innate earnings quality and the discretionary earnings quality. Specifically, the voluntary sustainability disclosure is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality.

Panel B suggests how the disclosure quality, whether following the GRI guidance, influences the diffidence in earnings quality between disclosing firms and non-disclosing firms. In my DID sample, there are 895 firm-year observations which followed the GRI guidance in sustainability disclosure and 157 firm-year observations which didn't follow the GRI guidance in sustainability disclosure. I find for firms following GRI guidance, the disclosing firms' mean IEQ value (mean DEQ value) is significantly higher (lower) than the matched non-disclosing firm's mean IEQ value (mean DEQ value). I also find for firms non-following GRI guidance, the disclosing

firms mean IEQ value is significantly higher than the matched non-disclosing firm's mean IEQ value but the disclosing firms mean DEQ value is not significantly lower than the matched non-disclosing firm's mean DEQ value. Finally, I find both the difference of IEQ and the difference of DEQ between following firms and matched non-following firms are not significant at 5 percent level. This suggests that my first measurement of disclosure quality, whether following the GRI guidance in sustainability disclosure, cannot significantly influence the relation between innate earnings quality and sustainability disclosure and the relation between discretionary earnings quality and sustainability disclosure. I conjecture two possible explanations. First, the GRI framework may be still need improvement. The current GRI guidance maybe cannot help preparers to better evaluate and plan firm operations and strategies and thus cannot be linked to better earnings quality. Therefore, new version of guidance can be released by GRI to continue improving the quality of sustainability disclosure. Second, firms which don't follow GRI framework may prepare their sustainability reports based on other framework or guidance with good quality. Thus there is no difference of firm operations between GRI following firms and GRI non-following firms. Therefore, whether following GRI framework will not influence the relation between innate/ discretionary earnings quality and sustainability disclosure.

Panel C suggests how the application level of GRI Framework (DIS_Q2) influences the relation between earnings quality and sustainability disclosure. If the DIS_Q2 is equal to at least 5, the application level of GRI framework is defined as high. Otherwise, the application level of GRI framework is defined as low. First, for firms with high GRI framework application level, I find that disclosing firms have a significant higher mean value of innate earnings quality than matched non-disclosing firms do. In contrast to the full sample, I don't find a significant lower mean value of

discretionary earnings quality for disclosing firms compared to non-disclosing firms. This suggests that disclosing firms which prepare their sustainability disclosure based on stricter framework will reduce the managerial discretion and thus the voluntary disclosure will not significantly reduce the discretionary earnings quality. Second, for firms with low GRI framework application level, I find that disclosing firms don't have a significant higher mean value of innate earnings quality than matched non-disclosing firms do. But I find a significant lower mean value of discretionary earnings quality for disclosing firms compared to matched non-disclosing firms. This suggests that if firms don't strictly follow the GRI framework to prepare the sustainability disclosure, they cannot enjoy the improvement in innate earnings quality and they also tend to have lower discretionary earnings quality due to the higher possibility of managerial opportunism. Finally, I find that both the difference of mean IEQ value and the difference of mean DEQ value between high and low application level are significantly positive (0.1981 and 0.1239 respectively). This suggests that the level of applying GRI framework in preparing sustainability reports will significantly influence the relation between innate/discretionary earnings quality and sustainability report. Specifically higher disclosure quality can strengthen the positive correlation between sustainability disclosure and innate earnings quality and mitigate the negative correlation between sustainability disclosure and discretionary earnings quality. In other words, the positive (negative) correlation between sustainability disclosure and innate (discretionary) earnings quality is more (less) pronounced when the disclosure quality is high. In conclusion, the quality of disclosure plays a significant role in examining the relation between earnings quality and voluntary disclosure.

6.1.3 Audit fees and sustainability disclosure

Because sustainability reports provide a comprehensive illustration of firm future financial and nonfinancial performance, I examine whether sustainability reports can substitute the traditional financial statements which only focus on short-term financial performance. If sustainability reports can substitute the traditional financial statements, the audit fees of financial statements may decrease, since investors may require a lower level of verification on financial statements when they already have a more comprehensive report (the sustainability report). Table 3 suggests the relation between audit fees and sustainability disclosure using the matching group approach.

In Panel A, I find that the disclosing firms' mean value of audit fees (mean value = 15.6876) is higher than the matched non-disclosing firms' mean value of audit fees (mean value= 14.2535) and the difference is significant at the one percent level. This suggests that the sustainability report cannot substitute the traditional financial statements because the investors don't reduce the requirement of verification level on financial statements. Moreover, because auditors are required to examine nonfinancial information according to the GAAS, the disclosure of sustainability reports in fact will increase auditors' efforts and then increase the corresponding audit fees. Therefore, the sustainability reports are complementary instead of substitutable to traditional financial statements.

Table 3: Audit Fees for the Disclosing and Nondisclosing Firms

Panel A: Disclosing versus Nondisclosing firms	Audit Fees
Disclosing Firms (N=1026)	15.6876
Nondisclosing Firms (N=1026)	14.2535
Disclosing - Nondisclosing	1.4341***
Panel B: Following GRI Guidance versus Non-Following GRI Guidance	
Following Firms (N=873)	
Disclosing Firms	15.6983
Non-disclosing Firms	14.2215
Disclosing - Nondisclosing	1.4768***
Non-Following Firms (N=153)	
Disclosing Firms	15.631
Non-disclosing Firms	14.4291
Disclosing - Nondisclosing	1.2019***
Following - Nonfollowing	0.2749*
Panel C: High versus Low GRI Framework Application level	
High GRI Framework Application Level (N=484)	
Disclosing Firms	15.6436
Nondisclosing Firms	14.3198
Disclosing - Nondisclosing	1.3238***
Low GRI Framework Application Level (N=151)	
Disclosing Firms	15.8125
Nondisclosing Firms	14.0091
Disclosing - Nondisclosing	1.8054***
High - Low Application Level	-0.4816***

Table 3 illustrates the DID test for the relation betweeen audit fee and sustainability report. Panel A tests the difference in audit fee between firms with sustainability report and firms without sustainability report. Panel B and C examine whether disclosure quality can influence the relation between audit fee and sustainability report and the disclosure quality is respectively measured as the dummy variable whether the sustainability report is prepared based on GRI framework and the application level of GRI framework in preparing the sustainability report. Ths *, **, and *** repsectively indicate the difference is significant at 10, 5, and 1 percent level.

Panel B suggests whether following the GRI guidance (DIS_Q1) influences the diffidence in audit fees between disclosing firms and non-disclosing firms. First, I find that for firms following GRI guidance in preparing sustainability disclosure, the mean value of audit fees is significantly higher than the matched non-disclosing firms. And for firms non-following GRI guidance, the mean value of audit fees is also significantly higher than the matched non-disclosing firms. However, the difference of mean audit fees between following and non-following firms is not significant at 5 percent level. This suggests that following GRI framework in preparing sustainability disclosure cannot lead to better disclosure quality and thus cannot reduce auditors' uncertainty. Similarly, the possible reasons include that GRI framework needs improvement or that firms non-following GRI framework may follow other voluntary disclosure guidance with high quality. Therefore, whether follow GRI framework in preparing sustainability disclosure (DIS_Q1) cannot significantly influence the relation between audit fees and sustainability disclosure.

Panel C illustrates how the application level of GRI Framework (DIS_Q2) influences the relation between audit fees and sustainability disclosure. If the DIS_Q2 is equal to at least 5, the application level of GRI framework is high. Otherwise, the application level of GRI framework is low. First, for firms with both high and low GRI framework application level, I find that disclosing firms have a significant higher mean value of audit fees than matched non-disclosing firms do. However, I find that the mean difference between disclosing and matched non-disclosing firms with high DIS_Q2 is significantly lower than the mean difference between disclosing and matched non-disclosing firms with lower DIS_Q2 ($\text{Audit\_Fee}_{\text{HighDIS\_Q2 – LowDIS\_Q2}} = -0.4816$). This suggests that auditors will require higher fees to compensate the higher risk derived from sustainability disclosure which don't strictly follow the GRI

framework. Therefore, the higher disclosure quality, better application of GRI framework, can significantly reduce the auditing risk premium caused by voluntary sustainability disclosure. In other words, the positive correlation between sustainability disclosure and audit fees is less pronounced when sustainability disclosure quality is high. In conclusion, the quality of disclosure plays a significant role in examining the relation between audit fees and voluntary disclosure.

6.2 OLS regression approach

In this section I conduct the OLS regression approach to test the relation among sustainability disclosure, disclosure quality, earnings quality, and audit fees. Table 4 illustrates the descriptive statistics and Pearson correlation for OLS regression sample. In the Panel A, I contrast the descriptive statistics between disclosing firms and matched non-disclosing firms. In the Panel B, the Pearson correlation is presented. And I find that the Disclosure, the release of sustainability report, is significantly associated with innate earnings quality and audit fee and is negatively associated with discretionary earnings quality, consistent with my results of DID tests. All the variables are winsorized at top and bottom one percentile except for Disclosure, BIG8 and Segment. All the coefficients' standard errors from OLS regressions have been adjusted for both firm level and year level clustering.

Table 4: Descriptive Statistics and Pearson Correlation for the OLS Regression Sample

Panel A: Descriptive Statistics

	Disclosing Firm Sample					Non-Disclosing Matched Firm Sample				
Variable	Mean	Median	Std Dev	25th Pctl	75th Pctl	Mean	Median	Std Dev	25th Pctl	75th Pctl
LnFee	15.7001	15.7382	0.8635	15.2230	16.4067	14.1298	14.2734	1.4108	13.4270	15.2882
IEQ	4.4336	4.4349	0.9327	3.8004	4.9401	4.1115	4.0712	1.0932	3.6558	4.6999
DEQ	-0.5110	-0.3672	1.9842	-2.0931	0.8338	0.2839	0.4971	1.5898	-1.0055	1.3118
Current	0.4001	0.3955	0.1673	0.2767	0.5030	0.5165	0.4950	0.2166	0.3663	0.6772
Segment	8.7338	8.0000	4.4368	6.0000	10.0000	7.2955	7.0000	3.7414	5.0000	9.5000
Report_Lag	57.3554	57.0000	13.2331	51.0000	62.0000	71.7955	64.5000	24.2080	53.0000	84.5000
firmsize	9.6340	9.6246	1.5153	8.7673	10.6318	8.2149	8.2473	2.0580	8.2831	9.8857
ROA	0.0692	0.0751	0.1810	0.0415	0.1096	0.0859	0.0610	0.5548	0.0236	0.1081
BTM	0.3673	0.3291	0.6832	0.2196	0.5200	0.2474	0.3043	0.9217	0.1571	0.4726
Leverage	0.2172	0.2037	0.1317	0.1202	0.2965	0.2980	0.1715	0.3493	0.0265	0.4414

Panel B: Pearson Correlation

	Audit_Fee	IEQ	DEQ	Disclose	ACCR	Big8	Current	Segment	Report_Lag	Size	ROA	Leverage
Audit_Fee	1											
IEQ	0.02083	1										
DEQ	**-0.09294**	-0.00453	1									
Disclose	**0.36459**	**0.01842**	**-0.0904**	1								

Table 4: Descriptive Statistics and Pearson Correlation for the OLS Regression Sample – Continued

ACCR	**0.18471**	0.02926	**-0.09439**	**0.16319**	1							
Big8	**0.4061**	**0.147**	**0.2949**	**0.39059**	**0.36813**	1						
Current	**-0.27875**	**0.33461**	**0.08469**	**-0.15181**	-0.06799	**-0.13338**	1					
Segment	**0.38456**	-0.00647	-0.03892	**0.17411**	**0.06924**	**0.1261**	**-0.1083**	1				
Report_Lag	**-0.31817**	-0.05091	-0.02327	**-0.22528**	-0.05185	**-0.3118**	**0.11788**	**-0.11704**	1			
Size	**0.75625**	**0.06163**	**0.13981**	**0.32381**	**0.15943**	**0.3837**	**-0.2808**	**0.29859**	**-0.41872**	1		
ROA	**0.32309**	**0.1451**	-0.02576	**0.22724**	**0.54776**	**0.51843**	**-0.0873**	**0.13025**	**-0.23744**	**0.46434**	1	
Leverage	**0.14071**	**0.12942**	**-0.00665**	**-0.11943**	**-0.30782**	**-0.20924**	**-0.3257**	**-0.1526**	0.04877	**-0.25987**	**-0.40827**	1

Table 4 displays the descriptive statistics and Pearson correlations for variables examined in the OLS regressions. Bold figures indicate the correlation is significant at less than 5 percent level. All variables are winsoried at top and bottom one percentile except for Disclose, Big8, Segment.

6.2.1 Sustainability Disclosure and Earnings Quality

Table 5 suggests the relation between sustainability disclosure and earnings quality using the OLS regressions. Specifically, in Panel A, I investigate the relation between sustainability disclosure/disclosure quality and innate Earnings Quality (IEQ). First, I find that the dummy variable, whether releasing sustainability report in the sample year (Disclose), is significantly positively correlated with the IEQ (Coefficient=0.0326, P-value =0.0012). This suggests that the release of sustainability disclosure is associated with better innate earnings quality. Moreover, I find that control variables, such as net operating assets (NOA), operating cycle, ROA, firm size and current assets, are positively correlated with the innate earnings quality. In contrast, earnings volatility, book-to-market ratio, and leverage ratio are negatively correlated with the innate earnings quality. Second, I don't find a significant correlation between following the GRI framework (DIS_Q1) and innate earnings quality (IEQ). Finally, I find that a significant and positive correlation between the application level of GRI framework (DIS_Q2) and IEQ (coefficient = 0.0139 and p-value=0.0085). Therefore, consistent with the results of Difference-in-Difference approach, the sustainability disclosure and the application level of GRI framework in preparing sustainability disclosure is positively associated with innate earnings quality.

Table 5: the relation between earnings quality and disclosure quantity/quality

Panel A: Innate Earnings Quality

	Dependent Variable = IEQ					
Intercept	3.3327	<.0001	3.8701	<0.0001	4.0961	<.0001
Disclose	0.0326	0.0012				
DIS_Q1			-0.0182	0.1795		
DIS_Q2					0.0139	0.0085
BIG8	-0.1095	0.2297	0.2122	0.2645		
NOA	0.2283	<.0001	-0.0123	0.8487	-0.0044	0.9574
EarnVol	-0.0008	<.0001	-0.0008	<0.0001	-0.0007	<.0001
Cycle	0.2676	<.0001	-0.0765	0.0474	-0.0574	0.2961
ROA	0.3465	0.0159	0.1226	0.7564	0.2773	0.5667
SIZE	0.1117	<0.0001	0.1689	<0.0001	0.1442	<.0001
BTM	-0.1416	<.0001	0.058	0.0427	0.0676	0.044
Current	1.0174	<.0001	-1.6827	<0.0001	-1.7	<.0001
Leverage	-0.5791	<.0001	0.2454	0.2872	0.0578	0.8465
Year Fixed Effect	Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes	
Adjusted R-square	0.6184		0.5888		0.6069	
Observations	1,858		873		544	

Panel B: Discretionary Earnings Quality

	Dependent Variable = DEQ					
Intercept	0.6214	0.1548	0.077	0.8946	2.1155	0.0121
Disclose	-0.2160	0.0157				
DIS_Q1			-0.0181	0.8946		
DIS_Q2					0.0978	0.0342
BIG8	0.7428	0.0033	1.526	<.0001		
NOA	-0.0466	0.6109	-0.2429	0.0661	-0.2181	0.1995
EarnVol	0.0005	<.0001	0.0004	<.0001	0.0005	<0.0001
Cycle	-0.1476	<.0001	0.0755	0.3817	0.003	0.9807
ROA	-0.6454	0.0277	-0.3477	0.6482	-0.3072	0.7551
SIZE	0.1149	0.0055	-0.0701	0.1533	-0.1725	0.0122
BTM	0.1374	0.0456	-0.1969	0.0085	-0.1616	0.0806
Current	0.6323	0.0866	0.02552	0.6059	0.3752	0.566
Leverage	-0.3512	0.2247	0.6469	0.1833	0.1053	0.867
Year Fixed Effect	Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes	
Adjusted R-square	0.5134		0.6045		0.6102	
Observations	1,858		873		554	

Table 5 illustrates the OLS regressions to test the relation between earnings quality and sustainability report. In the Panel A, the dependent variable is the innate earnings quality. And in the Panel B, the dependent variable is the discretionary earnings quality. The interesting variables in each column are respectively Disclosure, a dummy variable whether the firm issues the sustainabiliy report during the sample year, DIS_Q1, a dummy variable whether the sustainability report is prepared based on GRI framework, DIS_Q2 which is the application level of GRI framework in preparing the sustainability report.

Panel B suggests the relation between sustainability disclosure/disclosure quality and discretionary earnings quality. First, I find that the dummy variable, Disclose, is significantly and negatively correlated with discretionary earnings quality (coefficient=-0.2160, p-value=0.0157). This suggests that sustainability disclosure is associated with worse discretionary earnings quality due to more managerial discretion. Second, I find that whether following GRI framework in preparing sustainability disclosure (DIS_Q1) is not significantly correlated with discretionary earnings quality. Finally, I find that the application level of GRI framework in preparing sustainability disclosure is significantly and positively correlated with discretionary earnings quality (coefficient=0.0978, p-value=0.0342). Therefore, my results of OLS regression are consistent with the results of DID tests. Although sustainability disclosure is associated with worse discretionary earnings quality, stricter application of GRI framework in preparing sustainability disclosure can limit managerial discretion and thus is associated with better discretionary earnings quality.

6.2.2 Sustainability disclosure and audit fees

In this section, I investigate the association between sustainability disclosure, disclosure quality and audit fees. Table 6 illustrates the results of OLS regression. First, in Column 1, I find that sustainability disclosure is positively correlated with audit fees and the coefficient is significant at 1 percent level (coefficient=0.3347, P-value=0.0063). This suggests that sustainability disclosure will increase auditors' risk expectation and thus is associated with higher audit fees. Second, I don't find a significant correlation between following GRI framework in preparing sustainability disclosure (DIS_Q1) and audit fees. Finally, I find that the higher application level of GRI framework in preparing sustainability disclosure is significantly associated with higher audit fees (coefficient=0.0582, p-value=0.0006). However, this doesn't

indicate the conclusion from OLS regression is different from the DID conclusion which suggests that disclosure quality will mitigate the negative correlation between sustainability disclosure and audit fees. Because my measurement of sustainability disclosure is a dummy variable, I cannot construct an interaction term between sustainability disclosure and disclosure quality. The lack of investigation in the interaction term, the results obtained from OLS regression are limited and need more careful interpretation.

In conclusion, most of my conclusions from OLS regressions are consistent with original conclusions from DID tests. I find that sustainability disclosure is associated with better firm operations and more managerial discretion, and thus sustainability disclosure is positively correlated with the innate earnings quality and negatively correlated with the discretionary earnings quality. Moreover, I find that better application level of GRI framework in preparing sustainability disclosure will reduce the managerial discretion and thus is associated with better innate earnings quality and also better discretionary earnings quality. Finally, auditors increase their estimation of risk for voluntary sustainability disclosure due to more managerial discretion and thus will charger higher audit fees. Therefore, sustainability reports are complementary instead of substitutable to traditional financial statements.

Table 6: the relation between audit fees and disclosure quantity/quality

	Dependent Variable = Audit Fees					
Intercept	10.5292	<.0001	10.8568	<.0001	10.8844	<.0001
Disclose	0.3347	0.0063				
Dis_Q1			0.0228	0.7036		
Dis_Q2					0.0582	0.0006
ACCR	0.2306	0.0121	-0.0074	0.661	-0.0181	0.4092
Current	-0.3836	0.0466	-0.1083	0.5708	-0.4309	0.0894
Segment	0.0435	<.0001	0.0469	<.0001	0.0625	<.0001
DEC	0.1417	0.0114	0.1119	0.0429	-0.0529	0.4352
Report_Lag	-0.0006	0.7501	-0.0005	0.809	0.0007	0.5929
Size	0.3667	<.0001	0.3851	<.0001	0.3483	<.0001
ROA	-0.1985	0.7026	-2.381	0.0002	-2.8948	0.0011
Leverage	0.6433	0.0009	0.9265	<.0001	0.7667	0.0031
LOSS	0.2244	0.0609	-0.1109	0.3602	-0.1285	0.396
Year Fixed Effect	Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes	
Adjusted R-square	0.7049		0.6368		0.6623	
Observations	1,570		785		472	

Table 6 illustrates the OLS regressions to test the relation between audit fee and sustainability report. The interesting variables in each column are respectively Disclosure, a dummy variable whether the firm issues the sustainabiliy report during the sample year, DIS_Q1, a dummy variable whether the sustainability report is prepared based on GRI framework, DIS_Q2 which is the application level of GRI framework in preparing the sustainability report.

7. Additional Tests

In this section, I conduct additional DID tests to check the robustness of my results from main tests. Here I employ the matching procedure by matching firm-year observations which is just one year after the first time release of sustainability reports and firm-year observations which is just one year before the first time release of sustainability reports. Therefore, I use the disclosing firms themselves to construct the matched group and thus control all other factors. Table 7 compares the earnings quality and audit fees of disclosing firms before and after the first time disclosure.

Table 7: Earnings Quality and Audit Fees for the Firms Before/After the First Time Disclosure

	IEQ	DEQ	Audie Fees
Panel A: Before and After the first release of sustainability reports			
Firms: After first time disclosure(N=257)	4.5736	-0.2476	15.3243
Firms: Before first time disclosure (N=257)	4.4397	-0.0709	15.2433
After - Before	0.1339***	-0.1767***	0.0809***
Panel B: Following or Non-following GRI framework			
Following GRI Guidance (N=190)			
Firms: After first time disclosure	4.5656	-0.3636	15.3594
Firms: Before first time disclosure	4.5011	-0.3102	15.2712
After - Before	0.0645*	-0.0534	0.0882***
Non-following GRI Guidance (N=67)			
Firms: After first time disclosure	5.5966	0.3167	15.2245
Firms: Before first time disclosure	4.5556	0.4411	15.1643
After - Before	0.041	-0.1255**	0.0603
Following - Nonfollowing	0.0235	0.0721	0.0279
Panel C: High versus Low GRI Framework Application level			
High GRI Framework Application Level (N=81)			
Firms: After first time disclosure	4.6622	-0.3183	15.2254
Firms: Before first time disclosure	4.4125	-0.479	15.2062
After - Before	0.2498**	0.1607	0.01926
Low GRI Framework Application Level (N=151)			
Firms: After first time disclosure	4.3796	-0.7417	15.5574
Firms: Before first time disclosure	4.3581	-0.3564	15.3185
After - Before	0.0215	-0.3853***	0.2389**
High - Low Application Level	0.2283**	0.546***	-0.2396**

The table 7 displays the robustness tests of the difference in innate earnings quality, discretionary earnings quality, and audit fee between the firms before the first time disclosure of sustainability report and the firms after the first time disclosure of sustainability report. The *, **, and *** respectively indiacte the difference is significant at 10, 5, and 1 percent level

Panel A suggests the relation between disclosing firms just before the year of first time disclosure of sustainability report and just after the year of first time disclosure of sustainability report. Consistent with the main conclusions, I find that after the first release of sustainability disclosure, firms will experience higher innate earnings quality, lower discretionary earnings quality and higher audit fees.

Panel B investigates the associations under different settings of following or non-following GRI framework in preparing sustainability disclosure (high DIS_Q1 versus low DIS_Q2). I find that compared to the year just before the first time sustainability disclosure, during the year which is just one year after the first time sustainability disclosure, firms following GRI framework tend to have higher audit fees. And I find that firms non-following GRI framework will have lower discretionary earnings quality after the first time release of sustainability reports. However, other associations are not significant at 5 percent level. Therefore, I don't find a significant effect of following GRI framework (DIS_Q1) on the relation between innate earnings quality and sustainability disclosure, the relation between discretionary earnings quality and sustainability disclosure, and the relation between audit fees and sustainability disclosure.

Finally, in Panel C, I compare the firms before and after the first time sustainability disclosure when the application level of GRI framework in preparing sustainability disclosure is either high or low (High DIS_Q2 versus Low DIS_Q2). Consistent with my main conclusions, I find that the positive correlation between innate earnings quality and sustainability disclosure is more pronounced when the application level of GRI framework is high and that the negative correlation between discretionary earnings quality and sustainability disclosure is more pronounced when the application level of GRI framework is low. Moreover, the higher risk premium

charged by auditors for firms with voluntary sustainability disclosure is more (less) pronounced when the application level of GRI framework is low (high). In conclusion, the quality of sustainability disclosure plays a significant role in explaining the relations among voluntary disclosure, earnings quality and audit fees.

8. Conclusions

This paper investigates the relations among voluntary disclosure, disclosure quality, earnings quality, and audit fees. Specifically, I first examine whether voluntary disclosure is substitute or complement to earnings quality. Prior research has long-time debates regarding the relation between voluntary disclosure and earnings quality. Following Moon (2014), I classify earnings quality into innate earnings quality and discretionary earnings quality and respectively investigate their relations to sustainability disclosure. Through both DID test and OLS regression, I find that sustainability disclosure is positively correlated with innate earnings quality and negatively correlated with discretionary earnings quality. Moreover, I find the disclosure quality, measured as the application level of GRI framework in preparing sustainability disclosure, can significantly influence the relation between earnings quality and sustainability disclosure. Specifically, the positive correlation between sustainability disclosure and innate earnings quality is more pronounced when disclosure quality is high and the negative correlation between sustainability disclosure and discretionary earnings quality is less pronounced when disclosure quality is high. Finally, I investigate whether the sustainability disclosure, which is a type of more comprehensive financial and nonfinancial report, can substitute the traditional financial statements which provide only financial and historical information. Through examining the relation between audit fees and sustainability disclosure, I find that auditors will charge higher risk premium when firms release

sustainability disclosure and thus the sustainability report is complement not substitute to traditional financial statements. Finally, I find that the risk premium charged by auditors will reduce when the quality of sustainability disclosure is high.

My paper contributes to accounting literature by providing new evidence for the long-time argument regarding to the relation between voluntary disclosure and earnings quality. Different from most prior papers, I respectively examine the relation between innate earnings quality and voluntary disclosure and the relation between discretionary earnings quality and voluntary disclosure, and find that the voluntary disclosure can be both complement and substitute to earnings quality. Moreover, my research suggests that disclosure quality, which is usually neglected by prior papers due to database limitation, plays an essential role in explaining the effect of voluntary disclosure on earnings quality and auditors' risk assessment. However, currently we are still lack of comprehensive guidance and standards to regulate firms' voluntary disclosures. My paper suggests that the low quality of voluntary disclosure will encourage managerial opportunism and increase audit fees. Therefore, my paper has policy implication for standard setters and other organizations (such GRI) to continue improving the framework and guidance to help firms prepare high-quality disclosures. I suggest firms should pay more attention to the disclosure quality when they are trying to increase the disclosure quantity to provide more useful information to outside decision makers. Finally, different from most prior papers which examine the financial disclosures (such as management earnings forecast), my papers examine the voluntary disclosure in a different setting through investigating the effectiveness of sustainability report which has obtained more and more attention from regulators, especially in Europe. Through investigating the nonfinancial sustainability disclosure,

my research fills the research gap and provides new evidence for building the framework of voluntary disclosure research.

CHAPTER 3

COST STICKINESS AND MANAGEMENT EARNING FORECASTS

1. Introduction

Cost management and financial reporting are two important responsibilities of the management. Cost plays an important role in firm's operation to generate profits and thus is always an interesting topic for practitioners and researchers. To maintain the firm effectively and efficiently, managers should make wise decisions in assigning resource appropriately to produce products or provide services. Moreover, it's also important to measure the resource allocation precisely and calculate the unit cost correctly to provide feedback for future decisions of resource assignment. However, one significant challenge faced by managers is how to clearly measure some resource usage which is not proportional to the firm's production volume, such as organizational expenses. The organizational expenses cannot be directly linked to each unit product/service, but their tremendous amount obviously has economics meanings and should not be ignored in making managerial decision. Accounting research has a long history in investigating the probable improvement in the measurement of cost. For example, Cooper and Kaplan (1992) develop the activity-based cost (ABC) method which can better measure the cost of resource usage through directly linking the resource usage of performing organizational activities to the products and services for which these activities are performed. Different from traditional costing method, ABC method can better allocate the organizational expenses to each unit product/service based on the activities performed. However, the ABC method cannot completely reduce the errors in measuring the cost. Prior research suggests that costing allocation systems, including ABC, will overstate the

overhead costs, because these costing systems assume that costs are proportional to activity but in fact it's not true (Norton and Soderstrom, 1994; Norton and Soderstrom, 1997).

To solve this problem, Anderson, Banker and Janakiraman (2003), hereafter ABJ, try to develop new model to explain the cost behaviors in the real business world. They build their theory based on two assumptions, resource adjustment cost and managerial deliberate choice. First, the cost management is a strategy deliberately chosen by the management. Second, when managers choose their cost strategies, it's not costless. According to the traditional view that cost is determined by sales, thus managers will reduce the resource level devoted into the production when the concurrent sales reduce. However, based on the assumptions of ABJ, managers have the discretion in determining the resource usage and when they adjust the resource usage they should burden the corresponding adjustment cost. Therefore, when the sales decrease, the managers will trade off between the cost of removing excess resource and the cost of maintaining current resource level with unused capacity. If managers decide not to remove unutilized resource when sales decrease, asymmetric cost behavior will happen because managers will always increase the resource level when sales increase, according to ABJ. Therefore, cost stickiness (anti-stickiness) that costs decrease by a smaller (larger) amount when sales decrease compared to the increase amount of costs when sales increase is the outcome of managerial deliberate choice of resource adjustment. And when determining the cost management strategy, managers will consider not only the adjustment cost itself but also the firm's cost structure, the expectation of future sales change, asset intensity, macro-economy and so on (such as Subramanian and Weidenmier, 2003; Anderson et al., 2003; Balakrishnan et al., 2004; Chen et al. 2012; Cannon, 2014). Moreover, because the

cost management is a managerial deliberate choice, the management itself plays an important role in explaining the firm's cost behavior. Therefore, the managerial incentive behind the cost management choice is worthwhile to discuss, because managers' interest may be not always aligned with the shareholders' interest according to the agency theory.

In fact, managers tend to choose the cost strategy with respect to their other operating, financing and investing strategies. To achieve the same goal of the firm as the whole, the cost strategy will be implemented to align with other operating, financing and investing strategies determined by managers. Therefore, the examination of the interaction between different strategies chosen by managers can help us better understating the complicated system of corporate management. In this paper, I examine how managers' cost strategy is associated with their voluntary disclosure strategy. I believe it's important to investigate how managers coordinate their internal operating system and external reporting system. Cost management is a typical internal accounting activity which provides useful information, such as performance feedback, for internal managers to make decisions. In contrast, voluntary disclosure is a typical financial reporting activity which provides useful information for external information users, such as investors, suppliers, customers and governments, to make decisions. Therefore, through examining the link between cost management strategy and voluntary disclosure strategy, we can better understand the whole system of accounting information including the interaction between the internal and the external information system.

Due to the separation of control and ownership, managers' choices, including cost stickiness, are not directly observed by outsiders. The information asymmetry exists between inside managers and outside managers may lead to "lemon problem"

with less market efficiency (Akerlof, 1970). Therefore, firms have the incentive to increase voluntary disclosure level to reduce the information asymmetry (Shroff et al. 2013). Moreover, according to ABJ, the managers are optimistic with their future sales when they decide to maintain unused capacity when sales decrease. Based on the signaling theory of voluntary disclosure, managers tend to voluntarily disclose the good news to distinguish themselves from other "worse" competitors. In conclusion, based on signaling theory and agency theory, I conjecture that the asymmetric cost behavior is positively correlated with the management's propensity to issue management earnings forecasts (MEF).

Moreover, the type of information disclosed by managers is also an important part of firm's financial reporting system. Prior research suggests managerial incentive can influence their strategies on the timing and choice of good news/bad news (Matsumoto, 2002; Cotter et al. 2006). Therefore, managerial discretion plays a significant role in both cost management strategy and the type of management earnings forecast. Optimistic (pessimistic) expectation of future earnings will persuade managers to maintain (remove) unused resource when sales decrease and also encourage managers to release related good (bad) news to the public. Moreover, Chen et al. (2013) suggest that managerial overconfidence is associated with cost stickiness. I believe that those overconfident managers will also be more likely to overestimate the firm's future earnings. Hence, I conjecture that the degree of cost stickiness is associated with the more (less) favorable earnings forecast released by managers.

To investigate the link between cost strategy and voluntary disclosure strategy, I collect my sample by merging fundamental data with management guidance data from I/B/E/S. To control the effect of information reporting environment, I collect

market data from CRSP database. The measurement of cost stickiness is based on the models developed by ABJ (2003) and Weiss (2010). After discussing the advantages and disadvantages of the two models, I alternatively use both the firm-level and industry-level measurements to capture the asymmetry cost behavior. I also alternatively use two measurements, the management's propensity to issue MEF and the frequency of MEF issued during the period, to measure the management's voluntary disclosure strategy. Through empirical tests with a sample between year 2005 and 2011, I find that the firm's level of sticky cost is positively associated with the firm's propensity to issue MEF and the frequency of MEF. Moreover, I find that the firm's level of sticky cost is associated with more favorite earnings news forecasted by managers. Finally, I find that the relation between cost stickiness and MEF behaviors is more pronounced when the MEF is long-horizon oriented and when the firm efficiency is high. I believe my results are robust by using alternative measurements of cost stickiness and MEF.

In conclusion, this paper discusses the association between firm internal accounting management and firm external accounting reporting through investigating the link between asymmetric cost behavior and management earnings forecast. First, my paper contributes to the accounting research through building a bridge between managerial accounting and financial accounting. Most prior papers disentangle the complicated accounting information system by focusing on either internal information system or external information system. The interdependencies among managerial decisions that shape the corporate accounting information system are lack of attention from prior research. However, in the real business world, managers should consider the two systems at the same time when making decisions. Beyer et al. (2010) suggest future research to develop the complete corporate information environment. Beyer

and Guttman (2012) examine the interdependencies between management's disclosure strategy and investing decisions. This paper provides the insight into the whole system of corporate information environment through discussing the interrelation between management's cost strategy and management's disclosure strategy, an interaction between internal managerial information system and external financial information system. Therefore, I provide better understating of the managerial incentive and the managerial strategies under a setting which can mimic the complicated interactions of different elements in the real business world. Second, most prior papers which examine the cost stickiness focus on the determinants of asymmetric cost behavior. In contrast, my paper provides some evidence for the consequences of cost stickiness strategy chosen by managers and thus enriches the related research framework. Finally, my findings are also relevant to current debates among policymakers, academia and practitioners regarding the regulation of mandatory and voluntary disclosures through discussing the managerial incentive behind the managerial disclosure strategies.

The rest of this paper is organized as follows: Section II presents a review of literature on cost stickiness and MEF. The theoretical framework, research questions, and hypothesis development are discussed in Section III. Section IV explains the methodology, including research models and sample collection. Results are presented in Section V, and Section VI concludes the paper.

2. Literature Review

2.1 Stickiness of Cost

Cost structure is an important managerial strategy in management accounting and has obtained the attention from accounting research for a long-term history. Because cost plays an important role as sales in determining the firm's earnings, the

management should clearly understand and precisely calculate the costs of resource used by each product or service. Traditionally, firms use the volume-driven method to allocate the indirect cost, and thus the cost is directly linked to sales. However, certain non-production cost, such as SG&A expense, is difficult to be allocated to each product/service, because this kind of resource cost is not proportional to the volume of product/service units produced or sold (Miller and Vollman, 1985; Copper and Kaplan, 1988). Therefore, Cooper and Kaplan (1992) suggest that the use of activity-based cost (ABC) method can better measure the cost of resource usage through directly linking the resource usage of performing organizational activities to the products and services for which these activities are performed. Both the traditional cost system and ABC method believe that cost will proportionally change with respect to the change of units sold or activities performed. However, Norton and Soderstrom (1997) find the costing allocation systems, including ABC, will overstate the overhead costs for hospital service departments. The authors believe the reason is that traditional cost system, including ABC, assumes that costs are proportional to activity but in fact it's not true (Norton and Soderstrom, 1994).

Because the traditional view which believes cost is determined by the sales cannot empirically explain the cost behaviors in the real world, Anderson, Banker and Janakiraman (2003), hereafter ABJ, explain the cost behavior through two new hypotheses, including resource commitment hypothesis and deliberate management choice. ABJ suggests that cost is sticky because they empirically find that SG&A expenses decrease by a smaller amount when the corresponding sales decrease but increase by a larger amount when the sales increase. In the ABJ model, cost is determined by resource adjust cost and deliberate management choice, instead of sales. Resource adjust cost incurs, when managers determine to remove the

committed resource (when sales decrease) or restore the committed resource (when sales restore). Therefore, when sales decrease, managers will trade-off between the cost of adjusting committed resource with respect to sales reduction and the cost of maintaining current resource level with unused capacity. If managers predict the future sales can be restored in the short-term period, managers will believe that the resource adjust cost is larger than the cost of operating with unused capacity and thus they tend to deliberately maintain current resource level and cause the cost to be sticky. In conclusion, according to ABJ, the asymmetry in the cost behavior exists because the cost is not proportional to sales but is committed by resource adjust cost and managers' decisions.

Following ABJ, a lot of papers begin to discuss the cost stickiness phenomenon. Malik (2012) summarize three groups of research, including the evidence, determinants and consequences of asymmetric cost behavior. First, the evidence of stickiness cost is examined under different settings and tested through both time-series and cross-sectional method. For example, Balakrishnan and Gurca (2008), Calleja et al. (2006) and Subramanian and Weidenmier (2003) respectively find the evidence of cost stickiness through department level comparison, industry level comparison and country level comparison. Banker et al. (2011) conclude the cost stickiness is the prevalent global evidence through using large panel data from 1988-2008 for all countries in the Global Compustat database.

Although many prior papers empirically find the evidence of cost stickiness, there are incomplete answers to the determinants of cost stickiness. ABJ and some other papers believe that the asymmetric cost behavior is caused by resource adjust cost and management deliberate choice (such as Subramanian and Weidenmier, 2003; Banker et al., 2013). Prior research believes some other factors may also influence the

cost stickiness phenomenon, such as asset intensity (Subramanian and Weidenmier, 2003; Anderson et al., 2003), capacity utilization (Balakrishnan et al., 2004; Cannon, 2014), organizational core competency (Balakrishnan and Gurca, 2008), agency problem (Chen et al. 2012), managerial incentive (Kama and Weiss, 2010; Dierynck et al., 2012), loan financing (Banker and Fang, 2013), economic crisis (Banker et al., 2013), management overconfidence (Chen et al., 2013), fixed costs and scale of diseconomies (Balakrishnan et al., 2014), the change of regulation (Holzhacker et al., 2014), demand uncertainty(Banker et al., 2014a), prior sales change (Banker et al., 2014b) and labor unemployment risk (Kim and Wang, 2014). In conclusion, a lot of factors, including manager individual characteristics, firm specific characteristics and macroeconomics, may influence the asymmetric cost behaviors. Therefore, researchers are continuously improving the current model of cost stickiness to more precisely capture this cost behavior.

There are also several papers which address the effect of cost stickiness on earnings. For example, Banker and Chen (2006) suggest that the firm's cost stickiness plays an important role in predicting the future earnings. Anderson et al. (2007) further investigate the effect of sticky cost on future earnings and find that cost stickiness can lead to abnormal positive return. Because the cost stickiness will influence the earnings forecast, it may also influence the behaviors of financial analysts' earnings forecasts. For example, Weiss (2010) finds that stickier cost structure behavior will reduce the precision of analysts' earnings forecasts. Ciftci et al. (2013) further suggest that the enhancing analysts' awareness of cost stickiness will improve the quality of financial analysts' forecast. Prior research also finds that asymmetric cost behavior will not only influence the earnings forecast but also influence the stock market and macro-economy. For example, Banker et al. (2014c)

suggest the asymmetric cost behavior tend to increase the long-horizon return. Moreover, Rouxelin et al. (2014) suggest that the level cost stickiness derived from recent corporate filings is positively associated with the overstatement of future macro-level unemployment rates. Although some papers are trying to discuss the effect of asymmetric cost behavior, since the cost behavior is comprehensively linked to the firm operation, we still have a lot answered question regarding the effect of cost stickiness on managerial strategy and stock market. This also provides the research opportunity for this paper which focuses on the effect of cost behavior on managers' voluntary disclosure behaviors.

Although sticky cost phenomenon has been documented in many prior papers, several research doubts the real existence of asymmetric cost behavior. First, Anderson and Lanen (2009) question the validity of cost stickiness because they find that the sticky cost evidence is insignificant after removing the "unusual" observations in which costs and sales move in different directions and that the number of employee doesn't exhibits significant cost stickiness. Second, Via and Perego (2014) criticize the empirical analysis approach and interpretation of sticky cost behavior because they empirically find that asymmetric cost behavior exits only for the cost of labor and not for SG&A costs, cost of goods sold and operating costs. Although there is room for improvement regarding the theory and methodology of sticky cost research, I believe sticky cost behavior is an interesting strategic phenomenon and is linked to other managerial strategies, including financial reporting.

2.2 Management earnings forecast

ABJ and following papers develop the framework of sticky cost and suggest that sticky cost is the consequence of management choice, although a lot of other

factors may influence the magnitude of cost stickiness. The deliberate cost management also will not only influence firm's earnings but also may affect other managerial strategies, such as management earnings forecast (MEF). As a typical financial voluntary disclosure, MEF has obtained attention from accounting research for long time. Hrist et al. (2008) summarize the works of MEF research through three components, including antecedents, characteristics and consequences. In this paper, I focus on the antecedents and characteristics of MEF.

First, the management's incentive to issue MEF and the management's choice are significantly influenced by the legal and regulatory environment (Baginski et al., 2002; Wang, 2007), information asymmetry (Diamond and Verrecchia, 1991; Verrecchia, 2001), pre-commitment to continue disclosure (Botosan and Harris, 2000), firm specific litigation risk (Brown et al., 2005), managerial incentives (Nagar et al., 2003), prior forecasting behavior (Skinner, 1994) and proprietary costs (Zhang, 2001). Specifically, prior research, such as Coller and Yohn (1997) and Baginski et al. (2002), suggests that firms with more prior information asymmetry tend to have more incentive to release MEF. Moreover, the managerial incentives also play a significant role in the determination of MEF, because MEF is a voluntary disclosure decided by the management based on the firm strategies. Specifically, the MEF behaviors are influenced by individual managers' characteristics (Bamber et al., 2010), insider trading activities (Cheng et al., 2013) and executive compensations (Nagar et al., 2003; Cheng et al., 2014). Moreover, some papers argue that managers have the incentive to release MEF, because they tend to achieve earnings targets through using the MEF to reduce the financial analysts' expectation of future earnings (Matsumoto, 2002; Cotter et al. 2006). In conclusion, forecast environment and managerial incentive significantly influence the management's propensity to issue MEF.

Second, prior research suggests managers issue MEFs with different characteristics to achieve different strategic goals. For example, prior papers suggest that managers will chose the disclosure of good news or bad news based on their expectations of market reactions and litigation risk (Kothari et al., 2009; Hurwitz, 2012). The quality of MEF also plays a key role in the voluntary disclosure activities. Prior research suggests that the precision of MEF is influenced by management's ability and managerial incentive. For example, Baik et al. (2011) suggest that CEO's ability is positively correlated with accuracy of management earnings forecast. And the accuracy of MEF will also be improved through the rational for management's incentive, such as the reduction of management's discretionary accounting choice (Jaggi and Sannella, 1995), better corporate governance (Ajinkya et al. 2005; Karamanou and Vafeas, 2005), and financial analysts following (Baginski and Hassell 1997). Therefore, I believe it's important to address the managerial incentive when discussing the type and quality of MEF.

In conclusion, as a type of corporate financial voluntary disclosure, management earnings forecast is significantly determined by managerial incentive which is also an important factor of sticky cost behavior. This also provides a theoretical framework for this research of the link between cost stickiness and management earnings forecast.

3. Hypotheses Development

3.1 Cost stickiness and management's incentive to issue MEF

As mentioned above, managerial deliberate choice of resource adjust activities plays an important role in explaining the sticky cost behavior, although several other factors will also influence the cost stickiness. According to ABJ, costs do not proportionally change with respect to the change of sales. Instead costs are committed

to the availability of resource. Therefore, based on their expectations of earnings, managers tend to manage their costs through deliberating adjusting the resource level. Specifically, when sales decrease, managers will consider whether adjust the resource level through the trade-off between the cost of adjusting resource and the cost of maintaining current resource level with unused capacity. If managers believe the downwards change of sales is temporary and the sales will recover in a short period, then they tend to maintain the current level of resource instead of incurring resource adjust cost, because there is a tremendous burden of cost to remove unused resource and to add back the resource in a short-run. Therefore, due to the management choice of resource adjust cost according to their earnings expectation, the asymmetric cost behavior is prevalent across different firms, industries and countries.

Similarly as cost stickiness, management earnings forecast is also a type of management deliberate choice. Moreover, managers tend to choose the voluntary disclosure strategy which is aligned with their cost management strategy. As mentioned above, the asymmetric cost behavior is the outcome of the management deliberate choice, because they believe their sales will restore in a short period. Hence, the management of the firm with stickier costs usually is more optimistic regarding the firm's future sales and thus has decided to maintain the unused capacity when the sales decrease. According to the signaling theory of voluntary disclosure, managers tend to voluntarily disclose more information to the public, because they want to distinguish themselves from other "worse" competitors. Because the managers are optimistic with their future sales when they make stickier cost choice, they will also have the incentive to signal the good news to the public. Therefore, I conjecture that firms with stickier costs will be more likely to release quarterly management earnings forecast.

Second, agency theory also plays a significant role in explaining the link between cost stickiness and MEF. Due to the separation of ownership and control, managers have the information advantage compared to outside investors. The information asymmetry will lead to the lemon problem and reduce the market efficiency. Prior research suggests that managers have the incentive to voluntarily disclose information to reduce the information asymmetry and increase the market liquidity (such as Healy and Palepu, 2001; Shroff et al. 2013). Cost stickiness will also lead to information asymmetry, because it is derived from the internal managerial strategy which is not viewed by the outsiders. Thus managers have information advantage regarding the firm's costs-sales relation than outside investors and financial analysts do. Banker and Chen (2006) suggest that cost stickiness is a significant factor in predicting future earnings. Moreover, the lack of knowledge of firm's asymmetric cost behavior will lead to less accuracy of financial analysts' earnings forecast (Weiss, 2010). Hence, to reduce this information asymmetry caused by asymmetric cost behavior, managers have the motivation to increase the voluntary disclosure level. In conclusion, I develop the first hypothesis based on the signaling theory and agency theory:

H5: The degree of cost stickiness is positively associated with the management's propensity to issue quarterly management earnings forecast.

3.2 Cost stickiness and management earnings expectation

In this section, I tend to examine the link between cost stickiness and management earnings expectation. Because both cost stickiness and management earnings forecast are the results of management deliberate choice, the managerial discretion plays a significant role in explaining their association. If managers feel optimism (pessimism) about the future earnings, they tend to release the good (bad)

news, an earnings forecast which is more (less) favorable than the public expectation. Therefore, the type of MEF released by managers is influenced by managers' expectation regarding their future earnings. As mentioned above, when managers determine their cost management choice, they will also consider the firms future sales/earnings. If managers believe their sales will increase in the future, they will choose a stickier cost strategy through maintaining unused capacity during sales downturn. Hence, I conjecture that firms with stickier costs tend to be more likely to issue good news to the public.

Moreover, Chen et al. (2013) suggest that overconfident managers are more likely to overestimate future demand and thus will be less likely to remove unused resource when sales decline. Therefore, managerial overconfidence can also explain the asymmetric cost behavior. According to Chen et al. (2013), the managers in the firms with stickier cost are more overconfident regarding the firm's future sales. I believe that those overconfident managers also tend to overestimate the firm's future earnings. Therefore, those managers who determine the cost stickiness strategy have the incentive to release more favorable information to the public through quarterly management earnings forecast. In conclusion, based on the managerial discretion theory, I develop the following hypotheses:

H6a: The degree of cost stickiness is positively associated with earnings forecast of good news.

H6b: The degree of cost stickiness is negatively associated with earnings forecast of bad news.

4. Research Design

4.1 Management earnings forecast

The data of quarterly management earnings forecast are obtained from the Thomson First Call's Company Issued Guidance (CIG) database. However, Chuk et al. (2013) suggest that the CIG database is subject to coverage bias compared to hand-collected data from press release. Therefore, I need to carefully build the sample selection criteria. I limit the sample year after certain year, because Chuk et al. (2013) find that press releases issued after 1997 have higher probabilities of being represented on CIG compared to press releases issued in 1997. Moreover, prior research suggests that firms are more likely to issue voluntary disclosure after the FD regulation and thus I determine the sample year since 2005 to increase the representativeness of my sample. I also remove the forecast observations with announcement dates more than thirty days after the associated firm-quarter's fiscal period end date. And I exclude observations for which the MEF occurs within three days of either the analyst survey date, or the announcement date of realized earnings for that quarter. Following Kothari et al. (2009), I also exclude the extreme one percent of management earnings forecasts relative to analyst expectations and the extreme one percent of MEF forecast errors relative to realized EPS to mitigate the potential effects of miscoded data. Finally, I exclude "bundled" MEF issued concurrently with the earnings announcement, because Rogers and Buskirk (2013) suggest that the traditional calculation of bundled forecast news without any adjustment is subject to material measurement errors.

To measure the management earnings forecast behaviors, I respectively construct two measurements. First, the dummy variable (ISSUE) which is equal to 1 if the sample firm issues at least one quarterly MEF during the sample year, and zero

otherwise. Second, I capture the frequency of MEF (Freq) by summing the number of quarterly earnings forecasts released by the sample firm in the sample year.

In the test of hypothesis two, I consider the median value of most recent analyst survey of quarterly earnings expectation as the market consensus forecast of quarterly earnings. Then the news in the MEF is defined as the difference between the MEF and the financial analyst' forecast median, scaled by the absolute value of financial analyst' forecast median.[5] $NEWS$ = (MEF −Analyst_Median)/ |Analyst_Median|. For both MEF and financial analysts' forecast, I consider the stock dividends and stock split and adjust the EPS numbers by using the Factor to Adjust Shares published in the CRSP database. I include only those analyst forecasts which are released before management released earnings forecasts because financial analysts usually revise their forecasts based on the management earnings forecasts. Following Kothari et al. (2009), I only include MEF where the absolute value of News is greater than 1%, and the absolute value of Analyst_Median is greater than five cents per share. Finally, I winsorize the top and bottom one percentile of NEWS observations. Therefore, it's defined as good news (bad news) if the variable NEWS is more positive (negative).

4.2 Cost Stickiness

ABJ and following papers continuously are improving the methodology of calculating the degree of cost stickiness. The original ABJ model is based on the piecewise-linear relation between log-change in costs and concurrent log-change in sales:

[1] We calculate only the most recent management earnings forecast when managers issue multiple quarterly earnings forecasts during the same fiscal quarter for the same forecast period.

$$\Delta \ln COST_{i,t} = \beta_0 + \beta_1 \times \Delta \ln SALES_{i,t} + \beta_2 \times DEC_t \times \Delta \ln SALES_{i,t} + \varepsilon_t \quad (7)$$

where $\Delta \ln COST_{i,t}$ is the log format of changes in costs from the previous period. $\Delta \ln SALES_{i,t}$ is the log format of changes in sales from the previous period. DEC is the dummy variable, equal to 1 if the $\Delta \ln SALES_{i,t} < 0$ and zero otherwise. All variables in the equation 1 are adjusted for inflation effect. According to ABJ, the degree of cost stickiness is the change of cost in response to the sales decrease versus increase. Therefore, the firm chooses the cost stickiness (anti-stickiness) strategy, if the β_2 is negative (positive). The larger β_2 implies the lower degree of cost stickiness. I run regression of Equation (1) for each industry and each yea and thus I can get the industry-level cost stickiness (ABJ_Sticky) based on ABJ 2003 model.

Then Weiss (2010) develop a model which is especially useful in investigating the consequences of stickiness model through constructing the firm-level cost stickiness:

$$STICKY_{i,t} = \log\left(\frac{\Delta COST}{\Delta SALES}\right)_{i,\tau^-} - \log\left(\frac{\Delta COST}{\Delta SALES}\right)_{i,\tau^+} \quad (8)$$

$$STICKY_{i,t} = \log\left(\frac{\Delta COGS}{\Delta SALES}\right)_{i,\tau^-} - \log\left(\frac{\Delta COGS}{\Delta SALES}\right)_{i,\tau^+} \quad (9)$$

$$STICKY_{i,t} = \log\left(\frac{\Delta SG\&A}{\Delta SALES}\right)_{i,\tau^-} - \log\left(\frac{\Delta SG\&A}{\Delta SALES}\right)_{i,\tau^+} \quad (10)$$

where the $\tau^-(\tau^+)$ is the most recent period with a sales decrease (increase) over the last four periods. The cost is respectively measured by three variables following Weiss

(2010), including the cost which is the difference between sales revenues and income before extraordinary items, the cost of goods sold, and the selling, general and administrative expenses (SG&A). Using the Weiss (2010) model I can more directly examine the effect of cost stickiness on the management earnings forecast and thus get the firm-level cost stickiness (Cost_Sticky, COGS_Sticky, and SGA_Sticky).

I will implement both original ABJ and Weiss (2010) to capture the cost stickiness (equation 7 - 10), because both the two models have advantages and disadvantages. First, original ABJ is most easily to observe the degree of cost stickiness, but it doesn't consider the effect of other factors which will also influence the cost stickiness. Second, Banker and Byzalov (2014) suggest that the ABJ and the extended model are more useful in investigating the determinants of cost stickiness and instead the Weiss (2010) model is more useful in investigating the consequences of stickiness model. Therefore, the Weiss (2010) model is more appropriate for the objective of this paper. Second, Weiss (2010) model can provide firm-level measurement of cost stickiness, and instead the ABJ (2003) model can provide only industry-level measurement of cost stickiness. However, the Weiss model requires that sample firms should have both sales increase and sales decrease during past four periods. This requirement will significantly reduce the sample size. In conclusion, because the two models have both advantages and disadvantages, I use both of them to calculate the cost stickiness variable.

4.3 Control Variables

Prior research suggests that MEF is influenced by forecasting environment, information asymmetry, litigation risk and proprietary cost (Hirst et al., 2008). First, I control the firm's institutional ownership (Inst_Owner) which is percentage of firm's shares owned by the institutional investors at the period end. Then, I control the effect

of financial analysts through calculating the number of financial analysts following during the previous period (No_Analyst). To control the firm's information asymmetry level, I develop the return volatility (Ret_Vol) which is measured as the standard deviation of monthly raw return over the 36 months prior to the period t. Higher return volatility imply the higher level of information asymmetry. Moreover, I develop the MEF_Cost, which is the industry level weighted average entry costs to proxy firms' competency to face the threat of new entrants, following Gong et al. (2013). I multiply the MEF_Cost by -1, and thus the higher value indicates lower entry costs and higher proprietary costs. Prior papers suggest that the earnings predictability, earnings response coefficients and earnings non-synchronicity will significantly increase the management's incentive to release earnings forecasts (such as Gong et al. 2013). I define the earnings predictability (Earn_Predict) as the logarithm transformation of R-square from regressing return-on-assets for the period t on return-on-assets for period t-4 over a rolling window of 16 quarters prior to period t. The earnings coefficient response (ERC) is calculated by regressing three-day cumulative market adjusted stock returns on unexpected earnings over 36 months prior to the period t. And the earnings non-synchronicity (Nonsynch) which captures the firm-specific factors in explaining the earnings predictability is carefully introduced in Gong et al. (2013). In this paper, I use the mean of the top four highest r-square to calculate earnings non-synchronicity. Moreover, managerial management's financing strategies also will influence their MEF decisions (Beyer et al. 2010). I measure the financing strategies by constructing the dummy variable (SEO) which is equal to 1 if the firm issues new equity in the period t+1 and zero otherwise.

According to Matsumoto (2002) and Kothari et al. (2009), the management earnings expectations are influenced by institutional ownership (Inst_Owner), the number of financial analysts following (NO_Analyst), earnings coefficient response (ERC), financing strategies (SEO), growth prospects (Growth), reliance on implicit claim, litigation risk (Litigation). First, I use the difference between present total assets and previous year total assets scaled by previous year total assets to capture the growth prospects (Growth). Second, I define the litigation risk as the dummy variable which is equal to 1 if the firm is in the high-risk industry and zero otherwise[6]. Thirdly, I use two variables to measure the reliance on implicit claims. One variable is the dummy variable (Durable) which is equal to 1 of the firm is in the durable goods industry (SICs 150-179, 245, 250-259, 283,301, 324-399) and zero otherwise. The other one to capture the reliance on implicit claims is the labor intensity (Labor_Intense), defined as the 1 minus the ratio of PPE to gross assets.

Finally, I control firm characteristics in the tests of two hypotheses, including firm size (SIZE), which is the logarithm format of total assets at each quarter end, firm current profitability (ROA) measured as the return on assets, the dummy variable (LOSS) which is equal to 1 if the firm experiences loss in the period t and zero otherwise, the changes in earnings (ΔEPS), and the firm risk level (BTM) measured as the book-to-market ratio. Hence, I develop following equation to test the relation between cost stickiness and the management's propensity to issue MEF (H5):

[2] The high risk industry is defined as firm with SIC of 2833-2836, 3570-3577, 7370-7374, 3600-3674 and 5200-5961, according to Matsumoto (2002).

$$MEF = \beta_0 + \beta_1 Sticky + \beta_2 ERC + \beta_3 Earn\_Predict + \beta_4 Nonsynch + \beta_5 Ret\_Vol + \beta_6 Inst\_Owner + \beta_7 NO\_Analyst + \beta_8 MEF\_Cost + \beta_9 SEO + \beta_{10} SIZE + \beta_{11} ROA + \beta_{12} BTM + \beta_{13} \Delta EPS + \beta_{14} Time + \beta_{15} Industry + \varepsilon_1 \quad (11)$$

where MEF refers alternatively to the issuance of MEF (Issue) or the frequency of MEF (Freq). Where Stick represents alternatively to the three firm-level measurements of cost stickiness using Weiss (2010) model and the industry-level measurement of cost stickiness using ABJ (2003) model. I also develop the following equation to test the relation between management earnings expectation and cost stickiness (H6):

$$NEWS = \beta_0 + \beta_1 Sticky + \beta_2 ERC + \beta_3 Inst\_Own + \beta_4 NO\_Analyst + \beta_5 SEO + \beta_6 Growth + \beta_7 Labor\_Intense + \beta_8 Durable + \beta_9 Litigation + \beta_{10} SIZE + \beta_{11} ROA + \beta_{12} LOSS + \beta_{13} BTM + \beta_{14} Time + \beta_{15} Industry + \varepsilon_1 \quad (12)$$

where the NEWS represents the management earnings expectation relative to the market expectation (Good_News and Bad_News). All the variables in the Equation 11 and Equation 12, except dummy variables and NO_Analyst, are winsorized at top and button 1 percent level. I control fixed time effect and fixed industry effect as well.

4.4 Sample

I collect the management earnings forecasts from the Thomson First Call's Company Issued Guidance (CIG) database, the firm-level fundamental variables from the COMPUSTAT database, and the market variables from the CRSP database. The variable of institutional ownership and the variables related to financial analysts are

respectively obtained from Thomson Reuters database and I/B/E/S database. As mentioned above, I limit my sample after year 2004 to increase the representativeness of voluntary disclosure sample. Finally, my sample year is between 2005 and 2011. The sample sizes varies when I use different measurements to capture cost stickiness and when I respectively test H5 and H6. And all the standard errors presents in the OLS regressions are adjusted for the firm-level and year-level clustering.

5. Empirical Results

5.1 Cost stickiness and MEF

First, I investigate the Hypothesis 5 whether cost stickiness is positively associated with management earnings forecasts. The table 8 displays the descriptive statistics of H5 sample. I find values of four measurements of cost stickiness are close to negative, which indicates that cost stickiness is a widespread phenomenon in the real business world.

Table 8: Descriptive Statistics of the relation between cost stickiness and MEF Issuance

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
Cost_Sticky	0.01577	1.14046	-0.4431	0.00355	0.46321
COGS_Sticky	0.11108	1.2265	-0.406	0.05457	0.57317
SGA_Sticky	-0.1567	1.55182	-1.0385	-0.1671	0.70148
ABJ_Sticky	-0.0714	0.49406	-0.3005	-0.0663	0.14329
Earn_Predict	-2.6361	2.01051	-3.9598	-2.6432	-1.2748
Nonsynch	-0.6677	1.0265	-1.1914	-0.5858	-0.0787
ERC	13.0651	27.5856	-0.1517	5.91144	19.5965
Ret_Vol	0.12129	0.064	0.07479	0.10766	0.14994
Inst_Owner	0.68863	0.28368	0.50031	0.74449	0.89409
NO_Analyst	10.9373	8.55435	4	9	15
MEF_Cost	8.19976	2.08924	7.00091	8.59727	9.58503
SIZE	7.34725	1.82672	6.06934	7.34459	8.52011
ROA	0.00685	0.15085	0.00244	0.02998	0.07087
BTM	0.62894	0.55103	0.30854	0.51147	0.79832
ΔEPS	-0.0305	2.07397	-0.43	0.08	0.53

This table illustrates the descriptive statistics of the sample to test the relation between cost stickiness and the managerial incentive to issue management earnings forecasts.

Table 9 below displays the Pearson correlation among the variables in the H5 sample. Consistent with my conjecture, I find that that the four measurements of cost stickiness are positively and significantly associated with the issuance and frequency of management earnings forecast. Moreover, the four measurements of cost stickiness are highly positively correlated with each other. This suggests my sample is initially valid. Then I will test the association using the multivariate regression.

The Table 10 below investigates the association between cost stickiness and firm's management earnings forecast behaviors. I respectively use whether issue at least one quarterly MEF during the sample year (Issue) and the frequency of quarterly MEF released during the sample year (Freq) to measure the firm's MEF behaviors. In the Panel A, I respectively use Cost_Sticky, COGS_Sticky and SGA_Sticky to measure the firm-level cost stickiness based on Weiss (2010) model. I find that all three firm-level measurements of cost stickiness are positively associated with the firm's management earnings forecast behaviors. Specifically, the Cost_Sticky is positively and significantly correlated with whether firm issues the quarterly MEF (coefficient=0.0148 and P-value=0.0042) and the frequency of MEF release (coefficient=0.0765, P-value=0.0164). The COGS_Sticky is also positively and significantly associated with the frequency of MEF release (coefficient=0.0773, P-value=0.0147), and it's positively correlated with whether firm issues the quarterly MEF (coefficient=0.0085 and P-value=0.059) and the relation is significant at 10 percent level. Consistently, the SGA_Sticky is positively associated with whether firm issues the quarterly MEF (coefficient=0.0030 and P-value=0.0566) the frequency of MEF release (coefficient=0.0147, P-value=0.0671), and the relations are significant at 10 percent level.

Table 9: Pearson Correlation to Test the Relation between Cost Stickiness and MEF Issuance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)Freq	1																	
(2)Issue	**0.6824**	1																
(3)Cost_Sticky	**0.0105**	**0.0296**	1															
(4)COGS_Sticky	**0.0258**	**0.0235**	**0.5387**	1														
(5)SGA_Sticky	**0.0164**	**0.0094**	**0.3769**	**0.1719**	1													
(6)ABJ_Sticky	**0.0091**	**0.0101**	**0.0328**	**0.0446**	0.0126	1												
(7)Earn_Predict	**0.1049**	**0.0992**	**-0.0466**	**-0.0262**	**-0.0487**	0.0036	1											
(8)Nonsynch	**0.0703**	**0.076**	**-0.0486**	-0.0073	0.0256	-0.0115	**0.0562**	1										
(9)ERC	**0.1369**	**0.1634**	**-0.0293**	-0.0158	-0.0162	-0.0095	**0.0603**	**0.0665**	1									
(10)Ret_Vol	**-0.1672**	**-0.1701**	0.0067	**-0.0546**	0.0186	**0.0468**	**-0.152**	**-0.1046**	**-0.1167**	1								
(11)Inst_Owner	**0.2074**	**0.2638**	0.0015	-0.0041	**-0.037**	0.0092	0.0076	**0.0859**	**0.1616**	**-0.1205**	1							
(12)NO_Analyst	**0.1544**	**0.1529**	-0.0132	0.0242	**-0.0407**	**0.0209**	0.0175	**-0.0336**	**0.1658**	**-0.1787**	**0.3276**	1						

Table 9: Pearson Correlation to Test the Relation between Cost Stickiness and MEF Issuance – Continued

(13)MEF_Cost	**0.0568**	**0.0512**	-0.0009	**-0.0384**	**0.0584**	**0.0555**	-0.011	-0.0153	**-0.0192**	**0.1066**	**0.1018**	**0.2063**	1					
(14)SEO	**0.0861**	**0.0129**	0.006	-0.0024	0.0005	-0.0002	0.0153	-0.01	0.0051	**-0.0183**	0.0039	**-0.0275**	**-0.044**	1				
(15)SIZE	**0.1031**	**0.0592**	0.01	**0.0557**	**-0.0746**	0.0056	0.0157	**-0.0301**	**0.0181**	**-0.3905**	**0.1818**	**0.5626**	-0.01	**-0.034**	1			
(16)ROA	**0.1353**	**0.1659**	**0.1855**	**0.1065**	**0.0869**	0.0066	**0.0807**	**0.0755**	**0.1357**	**-0.378**	**0.2237**	**0.195**	**-0.046**	**0.0251**	**0.3192**	1		
(17)BTM	**-0.1235**	**-0.156**	**-0.1195**	**-0.1169**	**-0.0912**	-0.0126	**-0.03**	**-0.0809**	**-0.1146**	**0.1199**	**-0.1648**	**-0.2001**	**-0.177**	**0.0315**	**0.0318**	**-0.0936**	1	
(18)ΔEPS	**0.0271**	**0.0336**	**0.2835**	**0.1321**	**0.0756**	**0.0318**	**-0.039**	**-0.0538**	-0.0167	**0.0537**	**0.0332**	**0.0244**	**0.0308**	0.0095	0.0005	**0.2433**	**-0.1711**	1

This table displays the Pearson correlations among variables in the sample of hypothesis 5 to test the relation between the cost stickiness and the managerial incentive to issue managmeent earnings forecasts. The bold figure indicates the correlation is significant at 5 percent level.

Table 10: the Relation between Cost Stickiness and Management Earnings Forecast

Panel A: Firm-level cost stickiness

	Dependent Variable = Issue						Dependent Variable = Freq					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	-0.06816	0.6502	0.0708349	0.661	0.118642	0.5734	-0.694867	0.5259	-0.284229	0.7799	0.252674	0.8401
Cost_Sticky	0.014795	0.0042					0.0764986	0.0164				
COGS_Sticky			0.0084528	0.059					0.077316	0.0147		
SGA_Sticky					0.002993	0.0566					0.014703	0.0671
Earn_Predict	0.00322	0.0234	0.004288	0.1662	0.007417	0.0744	0.0216555	0.3523	0.023136	0.3241	0.025748	0.3663
Nonsynch	0.013891	0.0222	0.0118831	0.0585	0.016122	0.0355	0.1803978	0.0003	0.165651	0.0012	0.130867	0.0049
ERC	0.000836	0.0026	0.0007945	0.0046	0.000423	0.0161	0.0066207	0.0018	0.005798	0.005	0.006897	0.0127
Ret_Vol	-0.45231	<.0001	-0.453238	<.0001	-0.27914	0.0574	-4.341946	<.0001	-4.23936	<.0001	-4.114298	<.0001
Inst_Owner	0.226819	<.0001	0.2215621	<.0001	0.18704	<.0001	1.1521074	<.0001	1.064063	<.0001	0.879442	<.0001
NO_Analyst	0.001003	0.3359	0.0020906	0.0543	0.003883	0.0076	0.0043337	0.5833	0.013471	0.1074	0.021425	0.0232
MEF_Cost	-0.01203	0.0012	-0.008196	0.0327	-0.0214	<.0001	-0.06697	0.0082	-0.041824	0.1304	-0.087725	0.0083
SEO	0.132584	0.32	0.0219432	0.8734	0.119303	0.3777	0.3511047	0.7123	0.046233	0.9542	0.889475	0.067
SIZE	0.005263	0.0326	0.0051786	0.0341	0.003164	0.0658	0.2023008	<.0001	0.196412	<.0001	0.114358	0.0209
ROA	0.143477	0.0066	0.152256	0.0012	0.107976	0.0868	0.5392898	0.0881	0.795669	0.0036	0.775114	0.03
BTM	-0.05672	<.0001	-0.060771	<.0001	-0.06729	<.0001	-0.257971	<.0001	-0.284744	<.0001	-0.398513	<.0001
ΔEPS	0.002341	0.4196	0.0039684	0.1574	0.011322	0.0011	0.0116217	0.5492	0.025083	0.174	0.072219	0.0023
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	5327		5273		3081		5327		5273		3081	
# of forecasts	1486		1498		945							
# of non-forecasts	3841		3775		2136							
R-Square	0.1683		0.1665		0.165		0.1217		0.1241		0.1217	

Table 10: the Relation between Cost Stickiness and Management Earnings Forecast - Continued

Panel B: Industry-level cost stickiness

	Dependent Variable = Issue		Dependent Variable = Freq	
	Coefficient	P-value	Coefficient	P-value
Intercept	0.0254956	0.7579	-0.50423	0.3328
ABJ_Sticky	0.0044237	0.0398	0.0884924	0.0183
Earn_Predict	0.0091756	<.0001	0.0835501	<.0001
Nonsynch	0.0078995	0.0723	0.1427922	0.0002
ERC	0.0009729	<.0001	0.0078737	<.0001
Ret_Vol	-0.79935	<.0001	-5.806834	<.0001
Inst_Owner	0.2510286	<.0001	1.4853032	<.0001
NO_Analyst	-0.00537	0.9382	0.0056928	0.321
MEF_Cost	-0.011654	<.0001	-0.080677	<.0001
SEO	0.0806369	0.196	0.3341899	0.3852
SIZE	0.015531	<.0001	0.2119222	<.0001
ROA	0.1823899	<.0001	0.8300769	<.0001
BTM	-0.050067	<.0001	-0.267858	<.0001
ΔEPS	0.0031462	0.0814	0.0364283	0.0035
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Observations	11920		11920	
# of forecasts	3759			
# of non-forecasts	8161			
R-Square	0.206		0.149	

This table illustrates the association between cost stickiness and the managers' propensity to issue management earnings forecast (MEF). In the Panel A, the cost stickiness is measured by the three firm-level variables obtained from the Weiss (2010) model. In the first three columns, the dependent variable is the dummy variable whether the firm issues at lease one quarterly earnings forecast during the sample year. In the last three columns, the dependent variable is the frequency of quarterly MEF issued during the sample year. In the Panel B, the cost stickiness is measured by the industry-level variable obtained from the ABJ 2003 model. In the first column, the dependent variable is the dummy variable whether the firm issues at lease one quarterly MEF during the year. In the second column, the yeardependent variable is the frequency of quarterly MEF issued during the year.

In the Panel B, I use the ABJ (2003) model to measure the industry-level cost stickiness and investigate its association with firm's management earnings forecast behaviors. Consistently, I find that the industry-level cost stickiness (ABJ_Sticky) is positively and significantly associated with whether issue at least one MEF (coefficient=0.0044, P-valu0.0398) and the frequency of MEF release (coefficient=0.0885, P-value= 0.0183). In conclusion, through multivariate regressions I find that cost stickiness is positively associated with firm's MEF behaviors. This suggests that firms with the higher level of sticky cost tend to be more likely to issue management earnings forecasts.

5.2 Cost stickiness and management earnings expectation

In this section, I test the association between the firm's level of sticky cost and the managers' expectations regarding the future earnings. Table 11 displays the descriptive statistics of H6 sample. And Table 12 shows the Pearson correlations among variables of H6 sample. I find that the four measurements of cost stickiness are positively and significantly correlated with good news as expected, but I don't find a significant negative correlation between the four measurements of cost stickiness and bad news. More evidence should be provided using the multivariate regressions.

Table 11: Descriptive Statistics to test the relation between cost stickiness and MEF expectation

	Mean	Std Dev	25th Pctl	Median	75th Pectl
Good_News	0.20737	0.54635	0	0	0.0479
Bad_News	-0.1454	0.31265	-0.1469	-0.007	0
Cost_Sticky	0.05216	1.02512	-0.3506	0.01342	0.41627
COGS_Sticky	0.1305	1.06527	-0.303	0.08842	0.53565
SGA_Sticky	-0.1643	1.48522	-1.0197	-0.1957	0.70197
ABJ_Sticky	-0.0684	0.48856	-0.2682	-0.0873	0.1418
ERC	19.5497	32.1321	1.42324	11.8424	30.829
Ret_Vol	0.10531	0.04939	0.06901	0.09617	0.1306
Inst_Owner	0.80566	0.21392	0.68781	0.83547	0.94218
NO_Analyst	13.3319	8.35311	7	12	18
Growth	0.09746	0.22553	-0.0091	0.06155	0.15167
Labor_Intense	0.54637	0.34546	0.33157	0.65565	0.81713
SIZE	7.59063	1.67962	6.41839	7.52485	8.701
ROA	0.04229	0.10374	0.02082	0.05061	0.0865
BM	0.53219	0.40912	0.28861	0.45089	0.67125

This table illustrates the descriptive statistics of the sample to test the relation between cost stickiness and management earnings forecast expecation (good news and bad news).

Table 12: Pearson Correlation to test the relation between cost stickiness and MEF expectation

	(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)Good_News	1																		
(2)Bad_News	**0.1765**	1																	
(3)Cost_Sticky	**0.0829**	0.0305	1																
(4)COGS_Sticky	**0.0799**	0.0329	**0.4449**	1															
(5)SGA_Sticky	**0.0296**	-0.03	**0.3897**	**0.1515**	1														
(6)ABJ_Sticky	**0.0383**	0.0126	0.0193	**0.0523**	**0.0301**	1													
(7)ERC	0.0185	**0.0366**	**-0.047**	-0.01	-0.031	-0.016	1												
(8)Ret_Vol	**-0.033**	**-0.182**	-0.003	**-0.095**	0.0101	**0.0283**	**-0.078**	1											
(9)Inst_Owner	0.01	**0.0578**	-0.019	-0.035	-0.027	0.0253	**0.1421**	-0.022	1										
(10)NO_Analyst	-0.007	**0.1074**	-0.007	0.0443	**-0.081**	0.024	**0.1261**	**-0.132**	**0.1376**	1									
(11)Growth	**0.0408**	**0.0963**	**0.1323**	**0.1156**	**0.0844**	0.0006	**0.0631**	-0.018	**0.1076**	**0.0841**	1								
(12)Labor_Intense	**-0.045**	**-0.053**	-0.014	-0.029	-0.022	**-0.08**	**0.0812**	**0.1123**	**0.0986**	**0.1109**	**0.1536**	1							

Table 12: Pearson Correlation to test the relation between cost stickiness and MEF expectation – Continued

(13)Litigation	0.0085	**-0.044**	0.0296	**-0.048**	0.0103	**-0.053**	**0.0408**	**0.1666**	-0.011	**0.2072**	0.0166	**0.1646**	1						
(14)Durable	**-0.029**	-0.023	-0.015	**-0.047**	-0.055	**0.0527**	0.0181	**0.1394**	**0.0776**	**0.0566**	0.0171	**0.2052**	**0.1117**	1					
(15)SEO	0.0042	0.0014	0.0131	0.0088	-0.046	0.0115	0.0159	-0.008	0.0295	-0.028	0.0265	-0.01	0.0182	0.0297	1				
(16)SIZE	**-0.041**	**0.1796**	0.0068	**0.0952**	**-0.084**	**0.0383**	**-0.03**	**-0.436**	0.0106	**0.5457**	0.0098	**-0.101**	**-0.168**	**-0.114**	-0.022	1			
(17)Loss	-0.014	**-0.267**	**-0.196**	**-0.154**	-0.051	**-0.034**	**-0.079**	**0.3078**	**-0.081**	**-0.113**	**-0.211**	**0.0505**	**0.1036**	**0.0661**	-0.011	**-0.209**	1		
(18)ROA	**0.0413**	**0.1951**	**0.2462**	**0.148**	**0.0852**	**0.0366**	**0.1214**	**-0.243**	**0.1255**	**0.157**	**0.2741**	-0.012	**-0.053**	-0.022	0.0159	**0.1312**	**-0.64**	1	
(19)BTM	**-0.084**	**-0.22**	**-0.146**	**-0.188**	**-0.095**	**-0.032**	**-0.133**	**0.2092**	**-0.077**	**-0.209**	**-0.174**	-0.031	**-0.089**	**-0.044**	0.0149	-0.018	**0.293**	**-0.363**	1

This table displays the Pearson correlations among variables in the sample of hypothesis 6 to test the relation between cost stickiness and management earnings forecast expectation. The bold figure indicates the correlation is significant at 5 percent level.

Table 13 represents the results of the relation between cost stickiness and management earnings expectation. In the Panel A, I use the firm-level measurements of cost stickiness based on Weiss (2010) model, and I find that Cost_Sticky (Coefficient = 0.0239, P-value=0.0229), COGS_Sticky (Coefficient = 0.0139, P-value=0.0156) and SGA_Sticky (Coefficient = 0.0176, P-value=0.0321) are positively and significantly correlated with good news as expected. Unfortunately, I don't find a significant negative correlation between my three measurements of cost stickiness and bad news as expected. In the Panel B, I run the multivariate regression by using the industry-level cost stickiness measurement. Consistently, I find that the industry-level measurement, ABJ_Sticky, is positively and significantly correlated with good news (Coefficient=0.0274, P-value=0.0165), and I don't find a significant correlation between ABJ_Sticky and bad news.

In conclusion, I find a consistent evidence for the positive relation between cost stickiness and good news. This suggests that firms with the higher level of sticky cost are optimistic about their future earnings and thus tend to issue good news. However, I don't find a significant correlation between cost stickiness and bad news. This may suggest that the release of bad news is influenced greatly by macro factors instead of firm specific strategies.

Table 13: the Relation between Cost Stickiness and Management Earnings Expectation

Panel A: Firm-level cost stickiness

	Dependent Variable = Good_News						Dependent Variable = Bad_News					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	1.5379526	0.0319	1.501956	0.0089	2.0086124	0.0115	-0.164101	0.1134	-0.095642	0.4578	0.226617	0.0545
Cost_Sticky	0.0239365	0.0229					0.00298	0.7631				
COGS_Sticky			0.013869	0.0156					0.000334	0.9644		
SGA_Sticky					0.0176354	0.0321					-0.002639	0.6943
ERC	0.0001688	0.7371	-0.00028	0.5766	0.0009729	0.134	-0.000193	0.4895	-0.000179	0.5198	0.00036	0.253
Ret_Vol	-0.94136	0.0013	-0.8542	0.0019	-0.81716	0.0248	-0.163784	0.4052	0.050171	0.7763	0.158116	0.433
Inst_Owner	-0.091099	0.2034	-0.06563	0.3222	-0.024894	0.754	0.005937	0.906	0.030444	0.5277	-0.011298	0.8677
NO_Analyst	-0.005952	0.0118	-0.00395	0.0597	-0.005191	0.0493	-0.002096	0.1052	-0.003206	0.0129	-0.003477	0.0256
Growth	-0.022252	0.6861	0.005617	0.9075	0.0123761	0.8367	0.06828	0.0799	0.039707	0.2592	0.050649	0.2126
Labor_Intense	-0.113571	0.0119	-0.11702	0.0111	-0.164874	0.0098	-0.028699	0.3592	-0.017326	0.5953	-0.000985	0.9818
Litigation	0.0911597	0.0678	0.079596	0.0841	0.0698024	0.2797	0.007618	0.8217	0.034775	0.3153	0.016643	0.6788
Durable	-0.22491	0.0176	-0.21412	0.0217	-0.302332	0.0075	-0.045172	0.3508	-0.03853	0.4032	-0.072882	0.263
SEO	-0.16024	0.6044	-0.27436	0.1223	-0.203309	0.1086	0.052667	0.3743	-0.111033	0.2414	-0.411471	<.0001
Size	0.012932	0.2995	0.003786	0.7505	0.0070929	0.6391	0.039678	<.0001	0.041967	<.0001	0.055778	<.0001
Loss	-0.121804	0.0187	-0.06523	0.152	-0.091814	0.0882	-0.123685	0.0037	-0.138431	0.0008	-0.1073	0.0255
ROA	0.1094348	0.5486	-0.11514	0.5221	-0.032055	0.867	0.023188	0.8949	0.039472	0.7858	-0.01968	0.9143
BM	-0.101577	0.042	-0.13077	0.0008	-0.083344	0.0952	-0.093964	0.0049	-0.101848	0.002	-0.113669	0.0087
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	1694		1739		1113		1694		1739		1113	
R-square	0.1352		0.1394		0.1853		0.145		0.1556		0.1563	

Table 13: the Relation between Cost Stickiness and Management Earnings Expectation - Continued

Panel B: Industry-level cost stickiness

	Dependent Variable = Good_News		Dependent Variable = Bad_News	
	Coefficient	P-value	Coefficient	P-value
Intercept	0.817652	0.018	-0.321171	0.0029
ABJ_Sticky	0.027358	0.0165	0.007228	0.4602
ERC	0.000296	0.3463	0.000125	0.3344
Ret_Volatility	-0.8482	<.0001	-0.062935	0.6184
Inst_Owner	-0.04259	0.3581	0.046637	0.0666
NO_Analyst	0.000851	0.6238	-0.001672	0.0195
Growth	0.131894	0.0015	0.046438	0.0123
Labor_Intense	-0.15663	<.0001	0.008089	0.6931
Litigation	0.04205	0.1821	-0.011812	0.5905
Durable	-0.01463	0.8324	-0.025656	0.331
SEO	-0.0274	0.7944	0.041206	0.5577
Size	-0.01883	0.0201	0.031113	<.0001
Loss	0.05797	0.0456	-0.139668	<.0001
ROA	-0.06279	0.5515	-0.007305	0.9405
BM	-0.12407	<.0001	-0.113017	<.0001
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Observations	4086		4086	
R-square	0.1732		0.1416	

This table illustrates the OLS regression results to test the relation between cost stickiness and management earnings forecast expectations. The dependent variables are good news and bad news respectively for the first several and last several columns. In the Panel A, the cost stickiness is measured by the three firm-level variables obtained from the Weiss (2010) model. And in the Panel B, the cost stickiness is measured by the industry-level variable obtained from the ABJ 2003 model.

6. Additional Tests

6.1 Short-Horizon and Long-Horizon MEF

In this section, I conduct additional tests to investigate how cost stickiness is associated with short-horizon and long-horizon management earnings forecast. I define the short-horizon MEF as the management earnings forecast issued within 90 days prior to the forecast period. In contrast, the long-horizon MEF is defined as the management earnings forecast issued more than 90 days prior to the forecast period. The Table 14 suggests how the cost stickiness is associated with short-horizon or long-horizon MEF behaviors.[7]

In the Panel A, I investigate the relation between firm's level of sticky cost and the firm's propensity to issue short-horizon (Issue_SH) or long-horizon MEF (Issue_LH). I find that the Cost_Sticky is positively and significantly correlated with the firm's propensity to issue short-horizon MEF (Coefficient=0.0134, P-value=0.0057). However, I don't find a significant positive correlation between cost stickiness and the firm's propensity to short-horizon MEF when I use other measurements of cost stickiness, such as COGS_Sticky and ABJ_Sticky. In contrast, I find that all three measurements of cost stickiness are positively and significantly correlated with the firm's propensity to issue long-horizon MEF (Cost_Sticky: coefficient= 0.0120, P-value=0.0079; COGS_Sticky: coefficient=0.0093, P-value=0.0197; ABJ_Sticky: coefficient=0.0091, P-value=0.0232).

[3] Because the measurement, SGA_Sticky, is usually significant at 10 percent level in the main tests, here I didn't use this measurement in the short-horizon/long-horizon MEF tests.

Table 14: the effect of cost stickiness on long-horizon and short-horizon management earnings forecast

Panel A: Whether firms issue MEF

	Dependent Variable = Issue_SH						Dependent Variable = Issue_LH					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	0.052131	0.7291	0.197862	0.2168	0.077676	0.323	-0.085738	0.5186	-0.059136	0.6372	-0.086003	0.1791
Cost_Sticky	0.013435	0.0057					0.011996	0.0079				
COGS_Sticky			0.005403	0.2037					0.009253	0.0197		
ABJ_Sticky					0.001668	0.8299					0.009074	0.0232
Earn_Predict	0.003615	0.2117	0.00514	0.1171	0.009839	<.0001	0.005908	0.0359	0.005785	0.0411	0.009837	<.0001
Nonsynch	0.011052	0.0515	0.009214	0.0159	0.005361	0.2019	0.024285	<.0001	0.020795	<.0001	0.018265	<.0001
ERC	0.000591	0.026	0.00065	<.0001	0.000907	<.0001	0.000722	0.0056	0.000553	0.0363	0.000839	<.0001
Ret_Vol	-0.570193	<.0001	-0.577004	<.0001	-0.835829	<.0001	-0.512823	<.0001	-0.533122	<.0001	-0.804031	<.0001
Inst_Owner	0.202227	<.0001	0.202509	0.0204	0.232607	<.0001	0.159239	<.0001	0.132454	<.0001	0.188729	<.0001
NO_Analyst	0.001264	0.2056	0.002415	0.0075	0.000345	0.6081	-0.002673	0.0035	-0.001629	0.093	-0.00251	<.0001
MEF_Cost	-0.013192	0.0002	-0.009532	0.7674	-0.011156	<.0001	-0.004494	0.1575	-0.002316	0.4923	-0.008628	0.0001
SEO	0.071225	0.5971	-0.040542	0.9445	0.029502	0.632	0.035162	0.7592	0.022676	0.8196	0.091367	0.0296
SIZE	0.000972	0.849	-0.00036	0.0126	0.010378	0.0015	0.028649	<.0001	0.028559	<.0001	0.031749	<.0001
ROA	0.102875	0.0437	0.113109	<.0001	0.144673	<.0001	0.164969	<.0001	0.16527	<.0001	0.176254	<.0001
BTM	-0.055115	<.0001	-0.061124	0.2171	-0.048351	<.0001	-0.0373	<.0001	-0.038076	<.0001	-0.044752	<.0001
ΔEPS	0.002078	0.4505	0.003282	0.1574	0.002249	0.1921	0.00177	0.4796	0.004197	0.0821	0.004258	0.0071
Industry Fixed Effec	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	5327		5273		11920		5327		5273		11920	
# of forecasts	1269		1286		3301		1061		1048		2810	
# of non-forecasts	4058		3987		8619		4266		4225		9110	
R-Square	0.1665		0.1677		0.2007		0.1631		0.1622		0.2039	

Table 14: the effect of cost stickiness on long-horizon and short-horizon management earnings forecast - Continued

Panel B: The frequency of MEF

	Dependent Variable = Freq_SH						Dependent Variable = Freq_LH					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	0.561854	0.3917	0.965711	0.1221	0.525386	0.1049	-1.256721	0.0143	-1.249941	0.0103	-1.029616	<.0001
Cost_Sticky	0.036588	0.0427					0.039911	0.04				
COGS_Sticky			0.023619	0.1517					0.053696	0.007		
ABJ_Sticky					0.004728	0.8809					0.083765	0.0186
Earn_Predict	0.012051	0.2944	0.009039	0.4294	0.041972	<.0001	0.009604	0.5227	0.014098	0.3551	0.041578	<.0001
Nonsynch	0.034664	0.1201	0.028064	0.2197	0.02788	0.1122	0.145734	<.0001	0.137587	0.0003	0.114912	<.0001
ERC	0.002891	0.0162	0.002774	0.022	0.00424	<.0001	0.00373	0.0022	0.003024	0.0095	0.003634	<.0001
Ret_VoL	-2.653303	<.0001	-2.583229	<.0001	-3.061437	<.0001	-1.688642	<.0001	-1.656131	<.0001	-2.745397	<.0001
Inst_Owner	0.643119	<.0001	0.639704	<.0001	0.778124	<.0001	0.508989	<.0001	0.424359	<.0001	0.707179	<.0001
NO_Analyst	0.014085	0.0008	0.017324	0.0001	0.011947	<.0001	-0.009752	0.0619	-0.003853	0.48	-0.006255	0.081
MEF_Cost	-0.039166	0.0042	-0.023957	0.0939	-0.032726	0.0008	-0.027804	0.0699	-0.017868	0.3023	-0.047951	<.0001
SEO	0.022163	0.9703	-0.292143	0.5762	-0.104031	0.6904	0.328942	0.4104	0.338376	0.3057	0.438221	0.0065
SIZE	-0.022988	0.2826	-0.025283	0.2556	0.001819	0.8976	0.225288	<.0001	0.221695	<.0001	0.210103	<.0001
ROA	0.039572	0.834	0.317297	0.0561	0.356799	0.0003	0.499717	0.0102	0.478372	0.0038	0.473278	<.0001
BTM	-0.134928	<.0001	-0.161931	<.0001	-0.113718	<.0001	-0.123042	0.0023	-0.122813	0.0023	-0.15414	<.0001
ΔEPS	0.009747	0.34	0.012655	0.2012	0.013494	0.0452	0.001875	0.8821	0.012428	0.2995	0.022934	0.0035
Industry Fixed Effec	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	5327		5273		11920		5327		5273		11920	
R-Square	0.1115		0.1162		0.1488		0.1279		0.1293		0.1516	

This table illustrates the relation between cost stickiness and short-term MEF and the relation between cost stickiness and long-term MEF. The cost stickiness is measured by several industry-level and firm-level variables obtained from the ABJ 2003 model and the Weiss (2010) model. In the Panel A, the dependent variables are repsectively the issuance of short-horizon MEF and the issuance of long-horizon MEF in the first three and the last three columns. In the Panel B, the dependent variables are respectively the frequency of short-horizon MEF and the frequency of long-horizon MEF in the first three and last three columns.

In the Panel B, I investigate the relation between firm's level of sticky cost and the frequency of short-horizon (Freq_SH) or long-horizon MEF (Freq_LH) releases.). I find that the Cost_Sticky is positively and significantly correlated with the frequency of short-horizon MEF (Coefficient=0.0366, P-value=0.0427). However, I don't find a significant positive correlation between cost stickiness and frequency of short-horizon MEF when I use other measurements of cost stickiness, such as COGS_Sticky and ABJ_Sticky. In contrast, I find that all three measurements of cost stickiness are positively and significantly correlated with the frequency of long-horizon MEF (Cost_Sticky: coefficient= 0.0399, P-value=0.04; COGS_Sticky: coefficient=0.0537, P-value=0.007; ABJ_Sticky: coefficient=0.0838, P-value=0.0186). In conclusion, I find that the positive correlation between cost stickiness and MEF is more pronounced when the management earnings forecast is the long-horizon oriented. This result is consistent with my conjecture that managers will align their interests when they determine different strategies. When managers adjust the firm's resource level they will simultaneously consider and forecast the firm's future earnings. Therefore, managers will burden the lower level of resource adjust cost when they have forecasted the future earnings in an earlier period, and thus tend to choose the more sticky cost strategy.

6.2 The Effect of Firm Efficiency

As mentioned above, the cost stickiness is associated with managers' deliberate choice of resource adjustment. The management earnings forecast is also a type of managerial strategy based on managerial incentives and operation goals. Therefore, the firm's operating, investing and financing efficiency will significantly influence managers' choices, including cost stickiness management and management earnings forecast. In this section, I investigate how the relation between cost

stickiness and management earnings forecast is influenced by firm efficiency situation.[8] Table 15 displays the results of multivariate regressions. The measurement of firm efficiency is based on Demerjian, Lev and McVay (2012). In the Panel A, I test the effect of firm efficiency on the relation between cost stickiness and the firm's propensity to issue long-horizon MEF. First, I find that the measurements of cost stickiness are all positively correlated with the firm's propensity to issue long-horizon MEF when the firm efficiency is high (Cost_Sticky: coefficient=0.0603, P-value=0.0097; COGS_Sticky: coefficient=0.0780, P-value=0.0004; ABJ_Sticky: coefficient=0.0479, P-value=0.0414). In contrast, I don't find a significantly positive relation between cost stickiness and the firm's propensity to issue long-horizon MEF when the firm efficiency is low.

In the Panel B, I test the effect of firm efficiency on the relation between cost stickiness and the frequency of long-horizon MEF. First, I find that the measurements of cost stickiness are all positively correlated with the frequency of long-horizon MEF when the firm efficiency is high (Cost_Sticky: coefficient=0.2737, P-value=0.0143; COGS_Sticky: coefficient=0.3034, P-value=0.0229; ABJ_Sticky: coefficient=0.2452, P-value=0.0224). In contrast, I don't find a positive relation between cost stickiness and the firm's propensity to issue long-horizon MEF which is significant at 5 percent level when the firm efficiency is low. In conclusion, this suggests that the positive relation between cost stickiness and management earnings forecast is more (less) pronounced when the firm efficiency is high (low). This is consistent with my conjecture that the different choices determined by managers are interrelated among

[4] In the section 6.1, I suggest that the cost stickiness is more associated with long-horizon MEF instead of short-horizon MEF. In this section, I specifically test the effect of firm efficiency on the relation between cost stickiness and long-horizon MEF.

each other and these strategy interdependencies are influenced by the firm efficiency. Specifically when the firm efficiency is high, the different strategies are more interdependent and work together to align managers' interests.

7. Conclusions

This paper investigate how firm's cost stickiness strategy is associated with firm's voluntary disclosure strategy. Prior papers suggest that cost stickiness is a prevalent phenomenon in the business world and is a type of deliberate management choice. As we know, the management earnings forecast is also a type of voluntary disclosure determined by managers' choices. Therefore, I conjecture that these two managerial strategies are interdependent to each other to align managers' interests. Specifically, when managers determine the cost strategy they will also choose the corresponding MEF strategy. Through empirical tests with a sample between 2005 and 2011, I find that both the firm-level and the industry-level of cost stickiness is positively and significantly correlated with the firm's propensity to issue MEF and the frequency of MEF. I also find that the firm's level of sticky cost is associated with more good news announced by managers. My results are robust when I use alternative measurements of cost stickiness. Moreover, in the additional tests, I find the relation between cost stickiness and MEF is more pronounced when the MEF is the long-horizon and when the firm efficiency is high.

Table 15: the effect of firm efficiency on the relation between cost stickiness and MEF

Panel A: Whether firms issue MEF

Dependent Variable = ISSUE_LH

	when firm efficiency is high						when firm efficiency is low					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	0.991008	0.0639	0.037797	0.9142	0.705389	0.001	-0.3918	0.0346	-0.34946	0.0403	-0.333911	0.0032
Cost_Sticky	0.0603	0.0097					0.018545	0.1232				
COGS_Sticky			0.077968	0.0004								
ABJ_Sticky					0.047916	0.0414			0.011026	0.2761	0.034742	0.2571
Efficiency	-0.407788	0.1947	-0.363173	0.227	-0.59724	0.0021	0.177633	0.2828	0.258879	0.0901	0.38202	<.0001
Earn_Predict	-0.010399	0.3567	-0.013436	0.2052	0.010222	0.141	-0.01154	0.2243	-0.001699	0.8476	-0.005485	0.3361
Nonsynch	0.002147	0.9461	0.013756	0.6493	0.048392	0.0111	-0.00435	0.8335	-0.004435	0.829	0.004657	0.7361
ERC	0.000698	0.531	0.001342	0.2095	0.000195	0.695	0.001711	0.0732	0.001876	0.0179	0.001125	0.0142
Ret_Vol	-1.008787	0.0136	-0.71842	0.0623	-1.4777	<.0001	-0.74559	0.0029	-0.881767	0.0002	-0.799759	<.0001
Inst_Owner	0.107724	0.2266	0.068172	0.4175	0.211386	<.0001	-0.00516	0.949	0.062039	0.3868	0.045616	0.3097
NO_Analyst	0.00445	0.3425	0.007599	0.0689	0.006712	0.0062	-0.00218	0.6367	-0.005209	0.2489	-0.00287	0.2919
MEF_Cost	-0.046427	0.0108	-0.03887	0.0309	-0.02965	0.0212	-0.00448	0.7704	-0.004058	0.7925	-0.005059	0.7204
SIZE	0.023397	0.2635	0.022404	0.293	0.016537	0.1715	0.074664	0.0015	0.068849	0.0015	0.06228	<.0001
ROA	0.583372	0.0602	0.181277	0.4725	0.30443	0.0614	0.204439	0.0374	0.101141	0.1667	0.051084	0.2789
BTM	-0.048321	0.3217	-0.02442	0.5453	-0.07717	0.0094	-0.0459	0.0628	-0.049427	0.0246	-0.061838	0.001
ΔEPS	0.000831	0.9325	0.007353	0.3822	0.012129	0.0694	0.00269	0.7171	0.003771	0.5659	0.000465	0.9342
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	524		5273		1256		5327		5273		3081	
# of forecasts	187		169		526		86		93		298	
# of non-forecasts	337		359		730		365		409		945	
R-Square	0.2735		0.258		0.2879		0.2435		0.2517		0.2348	

Table 15: the effect of firm efficiency on the relation between cost stickiness and MEF – Continued

Panel B: Frequency of MEF

	Dependent Variable =Freq_LH											
	when firm efficiency is high						when firm efficiency is low					
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	4.323262	0.0626	0.18682	0.9101	3.416029	0.0013	-2.70448	0.0017	-2.205921	0.0033	-1.846934	0.0001
Cost_Sticky	0.273656	0.0143					-0.05052	0.3007				
COGS_Sticky			0.303418	0.0229					0.024745	0.5606		
ABJ_Sticky					0.245242	0.0224					0.238695	0.088
Efficiency	-2.893613	0.0403	-2.704256	0.0711	-3.5951	0.0001	1.628156	0.016	1.784871	0.0075	1.555534	0.0005
Earn_Predict	-0.057303	0.2895	-0.065795	0.2145	0.041325	0.2537	-0.05196	0.1798	-0.015169	0.6897	-0.017214	0.456
Nonsynch	0.182148	0.3472	0.190114	0.3072	0.358098	0.0004	0.049035	0.563	0.086631	0.3016	0.096078	0.0902
ERC	0.008486	0.0843	0.009901	0.0415	-0.00212	0.4762	0.010493	0.0284	0.011134	0.0062	0.004842	0.0208
Ret_Vol	-4.29667	0.0135	-3.540795	0.0416	-6.15392	<.0001	-2.25171	0.0316	-2.498097	0.0107	-2.513252	<.0001
Inst_Owner	0.007908	0.9831	0.022118	0.9521	0.560586	0.0271	-0.06349	0.8175	0.337002	0.1951	0.125611	0.4704
NO_Analyst	0.017642	0.4936	0.017967	0.4478	0.049283	0.0015	-0.03545	0.0707	-0.035923	0.046	-0.009604	0.4084
MEF_Cost	-0.147443	0.0662	-0.10143	0.2222	-0.1028	0.1034	0.004452	0.9439	0.005503	0.93	0.00034	0.9951
SIZE	0.254283	0.0105	0.23829	0.02	0.161348	0.0087	0.41995	0.0002	0.320385	0.002	0.306466	<.0001
ROA	0.981214	0.6961	0.493197	0.6534	0.483163	0.5696	0.295077	0.3894	0.187813	0.4642	0.155943	0.3747
BTM	-0.419064	0.0447	-0.277279	0.0936	-0.47375	0.0018	-0.15486	0.0867	-0.154462	0.0661	-0.201897	0.0041
ΔEPS	-0.032105	0.5496	-0.002609	0.9534	0.061728	0.1014	0.02309	0.4392	0.029598	0.199	0.011756	0.6406
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	524		528		1256		451		502		1243	
R-Square	0.2645		0.2337		0.2488		0.2435		0.2293		0.2169	

This table illustrates the relation between cost stickiness and the management earnings forecast when the firm efficiency is either high or low. In the Panel A, the dependent variable is the issuance of long-horizon MEF. In the Panel B, the dependent variable is the frequency of long-horizon MEF. In the first three columns, the relation is tested when the firm efficiency is high. And in the last three columns, the relation is tested when the firm efficiency is low.

My results contribute to accounting research through investigating the interdependent incentives behind each managerial strategy. First, cost stickiness is a prevalent phenomenon but have not obtained sufficient attention from accounting research to investigate its effect on firm operations. Second, this paper builds a link between financial accounting information (such as MEF) and managerial accounting information (such as cost stickiness) and thus provides new evidence regarding how managers operate the external financial and internal managerial accounting information systems to align their interests and provide information to external users. Finally, through examining the interdependency between managers' choices, we can better understand the whole complicated accounting information system in the real business world. I believe my paper will provide new insights into the research of managerial incentives behind their operating, financing and investing strategies.

CHPATER 4

HOW INDUSTRY PEER FIRMS INFLUENCE THE VOLUNTARY DISCLOSURE STRATEGY?

1. Introduction

Managerial voluntary disclosure is endogenously derived from the agency problem and information asymmetry between managers and investors (Beyer et al. 2010). Management earnings forecast (MEF), as one typical financial voluntary disclosure, has obtained attention from accounting literature for a long history. Scholars are interested in investigating why managers tend to voluntarily issue management earnings forecast and how managers determine their type, timing and specificity of MEF. Prior research suggests that forecasting environment and forecaster's characteristics will significantly influence the managers' propensity to issue earnings forecast (Hirst et al. 2008). Specifically, the MEF behaviors are influenced by regulation change (Baginski et al., 2002), information asymmetry (Diamond and Verrecchia, 1991), institutional ownership and financial analyst following (Barber et al., 2001), CEO ability (Baik et al., 2011), managers' personality (Hribar and Yang, 2010; Hilary and Hsu, 2011) and managerial incentive (Cheng et al., 2013). However, prior paper doesn't consider one endogenous factor, the impact of industry peer firms, which also will influence the firm's MEF behaviors, although the industry fixed effect is commonly controlled by researchers.

The pressures from industry peer firms significantly shape the managers' thinking and their corresponding strategies. Prior research suggests that the peer firms can influence the CEO performance evaluation (Albuquerque, 2009), executive compensation (Bizjak et al. 2008), tax avoidance choices (Li et al., 2013), investment decisions

(Ozoguz and Rebello, 2013), dividend policy (Popadak, 2012; Adhikari, 2013), and capital structure (Leary and Roberts, 2014). Recently, as the market competition rises, the impact of peer firms spread over firm's operating, investing and financing activities. This generates my interest in investigating how peer firms will influence firm's voluntary disclosure strategy.

I conjecture four plausible reasons to explain why industry peer firms may influence the firm's management earnings forecast behaviors. First, according to the signaling theory, firm has the incentive to follow the peer firms' disclosure strategy because keeping silence will be identified as a "bad" firm. Second, the free rider theory/herding theory suggests that firms tend to mimic the MEF behaviors of peer firms, especially the more successful peers, in order to save expenses and time. Third, the potential litigation risk also encourages firms to choose the herding strategy and thus follow others' behaviors (such as Floyd, 2012). Finally, the concerns about their career and reputation lead managers to mimic peers' disclosure strategy, when the disclosure performance has been identified as a method to evaluate the CEO's ability according to Baik et al. (2011). Hence, this paper is trying to discussing whether firms mimic their peer firms' management earnings forecast behaviors and which firms mimic and which firms are mimicked.

To investigate the impact of peer firms on voluntary disclosure, I first try to specifically identify how to measure the peer firms' behaviors. Leary and Roberts (2014) suggest that this type of research is facing the empirical problem when directly using the industry average values to proxy peer firms' behaviors, because it's difficult to conclude whether the firm's behaviors are really driven by peer firms' behaviors or they are driven

by the same institutional environment within the industry. To solve the endogeneity problem of industry average values, I construct the instrument variables, the earnings non-synchronicity of peer firms (excluding the specific firm i) and the ERC of peer firms (excluding the specific firm i), which can satisfy both the relevance requirement and the excludability requirement. According to Gong et al. (2013), the earnings non-synchronicity of peer firms is positively correlated with peer firms' MEF behaviors and is not associated with the specific firm's MEF behaviors, because the variable suggests how firm specific factors explain the specific firm's variations in earnings. Moreover, prior research suggests that ERC is significantly correlated with the good news and bad news disclosed by managers (Relevance) and the peer firms' ERC is not associated with the specific firms' management earnings forecast (Excludability). Then I construct several measurements to proxy the frequency, timeliness (long horizon versus short horizon) and type (good news versus bad news) of management earnings forecast behaviors. When I test the peer effects on disclosure frequency and disclosure horizon, I use the peer firms' earnings non-synchronicity as the instrument. When I test the peer effects on management earnings expectations, I use the peer firms' ERC as the instrument. Because I empirically test the models through using the two stage least square (2SLS) method, thus I can conclude the causal effect in this paper. I also alternatively use the 3-digit SIC code method and the text-based network industry classification method developed by Hoberg and Phillips (2010, 2015) to define the industry peer firms and thus ensure the robustness of my results.

I measure the voluntary disclosure based on the management earnings forecasts obtained from the Thomson First Call's Company Issued Guidance (CIG) database. Other

fundamental, market-based and financial analyst variables are respectively obtained from the COMPUSTAT database, the CRSP database, and Thomson Reuters database. I limit my sample after year 2004 to increase the representativeness of management earnings forecast sample. Finally, my sample year is between 2005 and 2011 and the sample sizes vary based on different measurements of voluntary disclosure and different methods to define industry peer firms.

The empirical results suggest that industry peer firms' disclosure strategy can significantly influence the specific firm's disclosure strategy. Specifically, the increase in the industry peer firms' disclosure frequency, disclosure horizon and disclosure of bad news will encourage the specific firm to increase its disclosure frequency, disclosure horizon and disclosure of bad news. Moreover, certain firms with S&P credit rating, higher profit, larger size and higher Market-to-Book ratio tend to be more sensitive to their peers' disclosure frequency and certain firms with higher profit and higher Market-to-Book ratio tend to be less sensitive to their peers' disclosure of bad news. Finally, I investigate whether there is the leader-follower relation in the peer effects of disclosure strategy. Through empirical test, I don't find that certain firms (leaders) are always mimicked and certain firms (followers) always mimic. In contrast, I find each firm respond actively to its peers' disclosure strategy no matter its position within the industry. This suggests the herding theory and free rider theory are not major reason in explaining the peer effects, because the leader-follower relation doesn't exist and the mimicking of voluntary disclosure is very pricy. I suggest that the signaling theory, litigation risk and CEO reputation are major reasons in explaining why firms mimic their peers' disclosure strategy.

In conclusion, this paper discusses how firms mimic their peers' voluntary disclosure strategy. This paper contributes to the accounting literature by examining the endogenous factor, the impact of industry peer firm, which is usually ignored by prior papers. My results provide new evidence to explain the managerial incentives behind the management earnings forecast behaviors. And I provide three plausible reasons (signaling theory, litigation risk and CEO reputation) to explain the impact of peer firms and exclude other two plausible reasons (herding theory and free rider theory), and thus this paper greatly enriches the academic views regarding the complicated financial reporting system. Moreover, different from most prior papers which suffer the serious endogeneity problem by directly use industry average values to measure the peer firms' behaviors, I implement the 2SLS method through the instrument and thus can conclude a causal effect of peer firm on the voluntary disclosure strategy. Therefore, my paper provides the guidance in discussing the possible solutions to solve the endogeneity problem which is always existed in the voluntary disclosure research. Finally, this paper also suggests the importance of regulating the voluntary disclosure by standard setters because of the herding effect. Hence, I hope this paper can provide the insight into better understanding the managerial incentives behind the voluntary disclosure strategy and thus help us build a healthier accounting information environment.

The rest of this paper is organized as follows: Section 2 reviews literature related to management earnings forecast and peer firms' effect. The theoretical framework, research questions, and hypothesis development are discussed in Section 3. Section 4 and Section 5 respectively explain my research methodology and sample selection, especially the way to construct the instruments and the way to define the industry peer firms. Main

results are presented in Section 6 and the additional sensitive tests are described in Section 7. Finally, Section 8 concludes the paper.

2. Literature Review

2.1 Management earnings forecast

Accounting information plays an important role in improving the market liquidity and mitigating the "lemon problem" described by Akerlof (1970). Voluntary managerial disclosure of future earnings forecast, one important type of accounting information, has been shown to explain 28.37% of the quarterly stock return variance, according to Beyer et al. (2010). Therefore, the antecedents, characteristics and consequences of management earnings forecast have obtained tremendous attention from accounting research. In this paper, I focus on the antecedent determinants and the characteristics of management earnings forecast to explain how industry peer firms will influence the specific firm's voluntary disclosure strategies.

Prior research suggests that the management's incentive to issue earnings guidance is significantly influenced by the forecast environment and forecasters' specific characteristics (Hirst et al. 2008). For example, Baginski et al. (2002) suggest that the legal environment can significantly influence the management's incentive to issue earnings forecasts. Barber et al. (2001, 2003) suggest that the increase in institutional ownership and financial analysts will also encourage managers to release MEF. Moreover, the managers' propensity to issue MEF is significantly determined by the information asymmetry faced by the firm, and specifically higher information asymmetry will force managers to increase disclosure level in order to hype the market (Diamond and Verrecchia, 1991; Verrecchia, 2001). Recent accounting literature also suggest that

managers' specific characteristics, including their ability (Baik et al., 2011), personality (Hribar and Yang, 2010; Hilary and Hsu, 2011) and self-incentive (Cheng et al., 2013), will affect the quantity and quality of MEF disclosed by the firms. Finally, management earnings forecast is not costless. The disclosure related costs, such as preparation costs and proprietary costs, will deter managers from unlimitedly disclosing private information to the public which will make the firms become too transparent (Verrecchia, 1983; Zhang, 2001). Therefore, the managerial incentive will lead the amount of voluntary disclosures to arrive a firm specific optimal level after considering the related benefits and costs.

In spite of the managerial incentive to issue MEF, the type (good news versus bad news) and the form (qualitative versus quantitative) of information contained in the MEF is also influenced by forecasting environment and forecaster's characteristics. For example, Bonsall et al. (2013) suggest that macroeconomy is the most important factor which explains the type of news contained in the MEF. Similarly, Kim et al. (2014) also suggest that managers are reluctant to release either good or bad news when macroeconomic uncertainty is high. Moreover, prior research finds that managerial incentive explains a great amount in the information contained in the earnings news released by managers. Managers will strategically determine the form, type, horizon and timing of disclosure to achieve their goal or align with their interests (such as Cheng and Lo, 2006; Cotter et al. 2006; Hutton et al. 2003; Waymire, 1985). Specifically, Fuller and Jensen (2010) express their concerns over managers' strategic forecast behaviors to mislead the market and manage market expectations.

In conclusion, management earnings forecast is a management strategic disclosure behavior and is influenced by both macro environment and micro firm itself. Currently, accounting literature has not yet completely explained the incentives behind the management earnings forecast, a "numbers game"[9] or a report to reduce information asymmetry or both. This also provides the research opportunity with my paper which tends to investigate the effect of industry peer firm pressure on the management earnings forecast.

2.2 Industry Peer Firm Pressure

Prior research suggests industry peer firms play an important role in shaping managerial strategies and corporate policies. For example, the empirical evidence shows that peer firms have an important impact on CEO relative performance evaluation (Albuquerque, 2009) and thus influence executive compensation (Bizjak et al. 2008). And Li et al. (2013) suggest that the pressure from peer firms will also influence firm's tax avoidance behavior. There are several recent papers discussing the impact of industry peer firms on firm's investment. For example, Ozoguz and Rebello (2013) find that managers' investment decisions are very sensitive to peer firms' stock prices. Similarly, Foucault and Fresard (2013) use a large sample of firms and conclude that corporate investments are positively associated with the market valuation of industry peer firms which produce and sell related products. And Beatty et al. (2011) suggest that there is the

[1] Some researchers, practitioners and regulators have concerned that management earnings guidance has become the earnings game, because managers are bind by providing the earnings guidance to meet the market expectations and thus encourage managerial myopia, such as Fuller and Jensen (2010), "Coke, Quarterly Estimation and 'The Number Game'" by Knowledge @ Wharton, "Numbers Game" speech by former SEC Chairman Arthur Levitt in 1998.

spillover effect of financial reporting frauds on peer firms' investment and specifically the scandal firm's earnings overstatements are positively correlated with peer firm's investments. In spite of the operating and investing activities, prior research provides evidence on the impact of peer firms on corporate financing activities. For example, several papers discuss the peer firms' effect on firm's dividend policy and all suggest that peer firms play a key role in corporate payout policies (Fang, 2009; Popadak, 2012; Qiu, 2013; Adhikari, 2013). Moreover, Mackay and Phillips (2005) find that industry, specifically the firm's position relative to its competitors within the industry, can significantly influence firm's financial leverage. Leary and Roberts (2014) also suggest that peer firms play a more important role in determining the firm's capital structure and financial policies than most previous identified determinants do and specifically the less successful firms tend to mimic the more successful peer firms.

In conclusion, economics, accounting and finance literature have the long history in discussing the effect of peer firms on firm's operating, financing and investing activities. Recently, the pressure from industry peer firms plays a more important role in shaping firm's strategies and policies, when the market competition becomes more severe. Because the firm's accounting information system behaves the interactions among managers, governments, investors, intermedia and also competitors, the impact of peer firms on firm's financial reporting and voluntary disclosure strategies has become an essential question for accounting scholars to develop the complete framework of information environment.

3. Hypotheses Development

As mentioned above, management earnings forecast, as a typical voluntary disclosure strategy, is significantly influenced by both macroeconomic factors and managerial incentive. Moreover, peer firms' behaviors on the one hand represent the choices of macro industry and on the other hand represent the sensitive responses to the market competition. Therefore, I conjecture that the firm's management earnings forecast behaviors will be significantly influenced by their peer firm's MEF behaviors. In the following paragraphs, I tend to use four plausible explanations to depict the impact of peer firms on firm's MEF behavior.

First, the signaling theory suggests that firms have the incentive to voluntarily disclose certain private information to the public in order to distinguish themselves from other "weaker" firms. Akerlof (1970) describes the inefficient market that the "lemon" product may camouflage itself as good product and thus push the good product out of the market because customers do not have the information to distinguish and "lemon" product and good product. The management earnings forecast can reduce the information asymmetry between insiders and outsiders and plays as a signal to indicate that the firm is different from other "lemons". Prior research suggests that MEF can successfully send the signal to the investors and get rewards from the market through higher market liquidity and lower cost of capital (Healy and Palepu, 2001). Therefore, if peer firms send the signal to the market using the MEF and indicate themselves as good firms, other firms have the incentive to follow the MEF behavior because non-disclosing firms will be automatically identified as "worse" firms which want to conceal their real situation through silence, according to the signaling theory.

Second, the free rider theory may also explain the effect of peer firms on the firm's management earnings forecast behavior. The free rider problem occurs when people can obtain the benefits without contributing any cost. And if the good is non-excludable and non-rival, everybody can use it without any payment. The free rider problem also happens when managers determine the corporate policies and strategies. Firms tend to follow the classic strategies introduced in the textbooks and the policies developed by their industry leaders. The imitation can save firms' expenses and time in investigating the firm's specific strategy and also provide some assurance on the success because a lot of precedents have verified it. The management earnings forecast is the good which is accessible for everyone, including the competitors. Therefore, firms can easily access the strategies of peer firms' voluntary disclosure and thus follow the same strategy. Anilowski et al. (2007) find that the number of firms providing MEF increased from approximately 10 to 15 percent in mid-1990s to 50 percent in 2004. This finding also suggests that a lot firms may be the free riders who follow precedents' successful MEF strategy in order to obtain the benefits from lowering information asymmetry.

Thirdly, litigation risk may play a significant role in explaining the peer firm influence on firm's MEF behaviors. Prior research suggests that firms have incentive to voluntarily provide earnings guidance in order to reduce litigation risk (Skinner, 1994; Skinner, 1997). Moreover, Bonsall et al. (2013) suggest that management earnings forecast is significantly influenced by macroeconomic factors. The peer firms' view in respect with the macro-economy reflected in their management earnings forecast will also encourage the specific firm's managers to have the similar expectation regarding the macro-economy. Therefore, during economic recession, managers tend to avoid litigation

problem through disclosing the bad news in advance, when they find their peer firms all have the pessimistic view on the macro-economy, because managers believe following the majority can reduce litigation risk. For example, Floyd (2012) finds the herding of bad news and suggests that firms are more likely to disclose bad news in the 10 trading days following the earnings restatements announced by the industry peers. Therefore, the herding of bad news to reduce the litigation risk may explain the impact of peer firms on firm's MEF behavior.

Finally, I believe the managers' concerns about their career and reputation may also force managers to consider their peer firms' strategies. Baik et al. (2011) suggest the earnings guidance contains useful information about the CEO's ability. Moreover, prior research finds that the firm's MEF performance will influence managers' job safety because the quality of MEF is positively correlated with CEO turnover (Pereira and Peterson, 2010; Lee et al., 2012). Hence, CEO should carefully determine their management earnings forecast strategies to maintain their career and reputation. As mentioned above, the relative performance evaluation is a popular method to determine executive compensation in industry (Albuquerque, 2009). Therefore, the managers will sensitively respond to the peer firms' MEF behaviors and may mimic the MEF strategies chosen by the industry peer firms.

In conclusion, I conjecture that peer firm's management earnings forecast behaviors will significantly influence a specific firm's MEF strategy, based on signaling theory, free rider theory/herding theory, litigation risk and managers' concerns about career and reputation. In the following paper, I will specifically examine two questions:

(1) whether firms mimic their peer firms' management earnings forecast behaviors; (2) which firms mimic and which firms are mimicked.

4. Research Design

4.1 Identification Problem and Instrument Construction

Leary and Roberts (2014) suggest researchers are facing empirical challenges in examining the peer effects, because the correlation between the specific firm's behavior and its peer firm's behavior can be attributed to two potential explanations. The first explanation suggests that firms within the same industry choose the similar actions because they face the similar macro-economy, technology and regulation situation. The second explanation suggests that firms within the same industry choose the similar actions because they sensitively respond to their peers. I believe the second explanation is the real peer effects that this paper tends to investigate. If I directly use the industry average numbers to measure the peer firms' actions, I cannot conclude whether the specific firm's action is at least partially driven by peer firms (Explanation 2) or is caused by the same industry environment (Explanation 1). Therefore, this type of research has an empirical problem to identify the effect of peer firms. Following Leary and Roberts (2014), I tend to construct the instrument variables to indicate the existence of peer effects.

In my setting, the instrument variable should be related to the peer firms' management earnings forecast behaviors (relevance) but not related to the specific firm's MEF behaviors (excludability). For different variables of management earnings forecast behaviors, I use different instruments to test the existence of peer effects. For the frequency and horizon of management earnings forecast, I tend to implement the lagged

earnings non-synchronicity of peer firms as the instrument, because following two reasons. First, earnings non-synchronicity refers the covariance between firm's earnings and its peers' earnings and thus describes the firm-specific factors which explain the firm's earnings variation (Gong et al. 2013). The authors find that the firm's earnings non-synchronicity is positively correlated with the propensity to issue the management earnings forecast. Therefore, my instrument, earnings non-synchronicity of peer firms, satisfies the first requirement (relevance), because it's correlated with peer firms' MEF behaviors. Second, the earnings non-synchronicity of peer firms is not correlated with the specific firm's MEF behavior and thus satisfies the second requirement (excludability), because the instrument explains the earnings variations of peer firms excluding the specific firm. For the management earnings expectations (good news or bad news), I tend to implement the earnings response coefficient (ERC) of the peer firms as the instrument. First, prior research suggests that ERC is significantly correlated with the good news and bad news disclosed by managers (Relevance). Second, the peer firms' ERC is not associated with the specific firms' management earnings forecast (Excludability). In conclusion, I respectively use the peer firms' earnings non-synchronicity (Peer_Nonsynch) and the peer firms' ERC (Peer_ERC) as instruments to test the industry peer effects on the specific firm's management earnings forecasts and the specific firm's management earnings expectations.

Following Gong et al. (2013), I calculate the earnings non-synchronicity by pair-wise regressing the specific firm i's return-on-asset (ROA) on its peers firms' (within the same two-digit SIC code, excluding firm i) ROA over the 16 quarters prior to quarter t. I construct R^2_{Top4} as the mean of the top four highest R-squares from the regressions

mentioned before. The earnings non-synchronicity (Nonsynch) is the logarithmic transformation of R^2_{Top4}, calculated as $\ln((1 - R^2_{Top4})/R^2_{Top4})$. The higher Nonsynch indicates lower earnings covariance with its peer firms' earnings and thus more firm's specific factors. Then I calculate the earnings response coefficient (ERC) through regressing three-day cumulative market adjusted stock returns on unexpected earnings over 36 months prior to the period t. To maintain consistency with the peer effects, I average the Nonsynch and ERC over all peer firms (excluding the specific firm i) to obtain the peer firms' values, following Leary and Roberts (2014).

4.2 Measurements of management earnings forecast

I construct my measurements management earnings forecast from the Thomson First Call's Company Issue Guidance (CIG) database. To mitigate the coverage bias of CIG suggested by Chuk et al. (2013), I limited the sample year after 2004. To solve the measurement errors caused by "bundled" MEF suggested by Rogers and Buskirk (2013), I exclude these "bundled" MEF including MEF issued concurrently with the earnings announcements. Moreover, I remove the forecast observations with announcement dates more than thirty days after the associated firm-quarter's fiscal period end date, and I exclude observations for which the MEF occurs within three days of either the analyst survey date, or the announcement date of realized earnings for that quarter. Finally, following Kothari et al. (2009), I also exclude the extreme one percent of management earnings forecasts relative to analyst expectations and the extreme one percent of MEF forecast errors relative to realized EPS to mitigate the potential effects of miscoded data.

Then I construct four variables to measure the firm's MEF behaviors. Following Ball et al. (2012), I respectively construct variables to proxy the frequency and timeliness

of management earnings forecasts. First, I use the frequency of MEF (Freq) issued within the sample year to measure the managerial incentive to release the MEF. The Frequency is calculated as the number the quarterly and annually MEF issued by the sample firm during the sample year. Second, the timeliness of MEF (Horizon) is measured as the one plus the natural log of the difference between fiscal end date and the forecast date. If firms issue multiple MEF during the sample year, I will average the Horizon for all forecasts. The larger value of Horizon indicates the more timely MEF behavior. And the non-disclosing firms will be excluded from the sample when I use the Horizon to measure the firm's MEF behaviors. I also respectively calculate the frequency of short-horizon MEF (Freq_SH) and the frequency of long-horizon MEF (Freq_LH) disclosed by the firm to test whether the industry peer firm effects appear differently when either short or long horizon earnings forecasts are disclosed. Following prior research, the short-horizon (long-horizon) MEF is defined as the management earnings forecast issued within (more than) 90 days prior to the forecast period.

Finally, I use the difference between MEF and market expectation to measure the managerial earnings expectation (good news versus bad news). The market expectation is calculated as the median value of the earnings forecasts issued by financial analysts during the same sample year for the same forecast period.[10] Then the forecast news (NEWS) is calculated as the difference between MEF and median analysts' forecasts, scaled by the absolute value of median analysts' forecasts.[11] Then it's defined as good

[2] Analyst forecasts issued after the announcement of management earnings forecast for the same forecast period are excluded from the sample.

[3] We calculate only the most recent management earnings forecast when managers issue multiple earnings forecasts during the same sample year for the same forecast period.

news (bad news) when the forecast news is larger (smaller) than the median of analyst forecast. Specifically, good news (GoodNews) is defined as the max (0, News) and bad news (BadNews) is defined as the min (0, News). Following Kothari et al. (2009), I only include MEF where the absolute value of News is greater than 1%, and the absolute value of Analyst_Median is greater than five cents per share.

To measure the industry peer firm's MEF behaviors, I average the peer firm's frequency, horizon, frequency of short-horizon MEF, frequency of long-horizon MEF, good news, and bad news over all peer firms excluding the specific firm i. And I add prefix "Peer" to distinguish the peer firms' variables from the specific firm's variables.

4.3 Control variables

To control other factors which influence the firm's MEF behaviors, including forecasting environment and forecaster characteristics, I introduce my control variables in this section. Specifically, the frequency, horizon, frequency of short-horizon MEF, and frequency of long-horizon MEF will share the same control variables. And the managerial earnings expectations will have different control variables from the other four measurements of MEF behaviors.

First, to test the effect of peer firms on the frequency and timeliness of MEF, I respectively control the firm's institutional ownership (Inst_Owner) and the financial analyst following (NO_Analyst). The institutional ownership is calculated as the percentage of firm's shares owned by the institutional investors at the period end and the financial analysts following is the number of financial analysts following the sample firm during the previous period. To control the firm's information asymmetry level, I develop the return volatility (Ret_Vol) which is measured as the standard deviation of monthly

raw return over the 36 months prior to the period t. Higher return volatility represents the higher level of information asymmetry. Following Gong. (2013), I use the industry level weighted average entry costs to proxy firms' competency to face the threat of new entrants (MEF_Cost). I multiply this variable of proprietary costs by -1, and thus the higher value indicates higher proprietary costs and lower propensity to issue MEF. Moreover, prior papers suggest that higher earnings predictability and higher earnings response coefficient will significantly increase the management's incentive to release earnings forecasts, and thus I include both ERC and earnings predictability as control variables. The calculation of ERC has been introduced in the previous paragraphs. The earnings predictability (Earn_Predict) is defined as the logarithm transformation of R-square from regressing return-on-assets for the period t on return-on-assets for period t-4 over a rolling window of 16 quarters prior to period t. Finally, Beyer et al. (2010) suggest that management's financing strategies will also influence their MEF decisions (Beyer et al. 2010). I measure the financing strategies by constructing the dummy variable (SEO) which is equal to 1 if the firm issues new equity in the period t+1 and zero otherwise.

To investigate the effect of peer firm's earnings expectation (SH_NEWS and LH_NEWS), following Matsumoto (2002) and Kothari et al. (2009), I include the control variables, including institutional ownership (Inst_Owner), the number of financial analyst following (NO_Analyst), earnings response coefficient (ERC), financing strategies (SEO), growth prospects (Growth), and litigation risk (Litigation). The former four variables are defined as the same mentioned in the previous paragraphs. I measure the growth prospects (Growth) as the difference between current year total assets and prior year total assets scaled by prior year total assets. Moreover, I define the litigation risk as

the dummy variable which is equal to 1 if the firm is in the high-risk industry (SICs 2833-2836, 3570-3577, 7370-7374, 3600-3674 and 5200-5961) and zero otherwise. Thirdly, I add the control variable to measure the reliance on implicit claims through constructing the dummy variable (Durable) which is equal to 1 of the firm is in the durable goods industry (SICs 150-179, 245, 250-259, 283,301, 324-399) and zero otherwise. Finally, I control the financial structure and profitability of firm through add two additional control variables, including the leverage ratio (Leverage) and the dummy variable whether the firm experience the loss during the sample year (Loss) .

Some control variables are the same for all four characteristics of MEF behaviors, including firm size (SIZE), which is the logarithm format of total assets at each quarter end, firm current profitability (ROA) measured as the return on assets, the changes in earnings (ΔEPS), and the firm risk level (BTM) measured as the book-to-market ratio. Hence, I develop two major models to test the effect of peer firms on the specific firm's MEF behaviors:

$$MEF = \beta_0 + \beta_1 PEER + \beta_2 Nonsynch + \beta_3 ERC + \beta_4 Earn_{Predict} + \beta_5 Ret_{Volatility} + \beta_6 Inst_{Owner} + \beta_7 NO_{Analyst} + \beta_8 MEF_{Cost} + \beta_9 SEO + \beta_{10} SIZE + \beta_{11} ROA + \beta_{12} BM + \beta_{13} \Delta EPS + \beta_{14} Time + \beta_{15} Industry + \varepsilon_1 \quad (13)$$

where MEF and PEER refers alternatively to the frequency, horizon, frequency of short-horizon MEF, and frequency of long-horizon MEF of specific sample firm and industry peer firms. To test the peer firms' impact on managerial earnings expectation I develop the following model:

$$NEWS = \beta_0 + \beta_1 PEER\_News + \beta_2 ERC + \beta_3 Ret\_Volatility + \beta_4 Inst\_Owner + \beta_5 NO\_Analyst + \beta_6 SEO + \beta_7 Growth + \beta_8 Durable + \beta_9 Litigation + \beta_{10} SIZE + \beta_{11} ROA + \beta_{12} LOSS + \beta_{13} Leverage + \beta_{14} BM + \beta_{15} \Delta EPS + \beta_{16} Time + \beta_{17} Industry + \varepsilon_1 \quad (14)$$

where the NEWS and PEER represents alternatively to the specific firm's and peer firms' good news and bad news disclosed by the management. All the variables in the Equation 13 and Equation 14, except dummy variables and NO_Analyst, are winsorized at top and button 1 percent level. I control fixed time effect and fixed industry effect as well. And both the two equations are implemented by the two-stage least square method (2SLS) using the two instrument variables, earnings non-synchronicity of peer firms for Equation 1 and ERC of peer firms for Equation 14. All the independent variables are one period lagged compared to the dependent variables. Finally, the standard errors are adjusted for both firm-level and year-level clustering.

5. Sample

5.1 Data Collection

I respectively collect the management earnings forecasts from the Thomson First Call's Company Issued Guidance (CIG) database, the firm-level fundamental variables from the COMPUSTAT database, and the market variables from the CRSP database. The variable of institutional ownership and the variables related to financial analysts are respectively obtained from Thomson Reuters database and I/B/E/S database. As mentioned above, I limit my sample after year 2004 to increase the representativeness of

voluntary disclosure sample. Finally, my sample year is between 2005 and 2011. The sample sizes varies when I respectively use different measurements to capture the management earnings forecast behaviors and use different methods to define the industry peer firms.

5.2 Industry peer firms

In this paper, I use two methods to get the industry peer firms' data. First, following Leary and Roberts (2014), I define the industry peer as the firms share the same 3-digit SIC code. Leary and Roberts (2014) find that industry peer firms' data obtained using 3-digit SIC code method are more close to represent the normal distribution compared to peer firms' data obtained using the 2-digit or 1-digit SIC code method. Therefore, I first use the 3-digit SIC code method to define the sample of industry peer firms. The final sample size is 9,336 when I test the peer firm effects on the frequency of MEF, and the sample size decreases to 2,528 and 3,116 respectively when I exclude the non-forecasting firms to test the peer firm effects on the horizon of MEF and the management earnings expectations.

Second, I alternatively use the text-based network classification of industry method develop by Hoberg and Phillips (2010, 2015) to define the industry peer firms[12]. Hoberg and Phillips (2010, 2015) develop a new time-varying method to classify industry sectors through comparing the product similarity of different firms based on the text-based analysis of product descriptions in the 10-Ks. Under this method, each firm will have its distinct industry peers during each year. And my final samples are slightly

[4] The text-based network classification of industry data can be obtained from the Hoberg and Phillips data library online.

smaller than the samples obtained through the 3-digit SIC code method and the sample size is respectively 8,866, 2,392, and 3,020 when I test the peer firm effects on the frequency of MEF, the horizon of MEF and the management earnings expectations.

To maintain the robustness of my conclusion, I alternatively use both the 3-digit SIC code method and text-based network classification method to define the industry peer firms. The Table 16 illustrates the descriptive statistics of variables included in the sample of Equation 13 and the sample of Equation 14. I contrast these variables calculated using either the 3-digit SIC code method and or Hoberg and Phillips method, and find that the variables calculated under the two different methods are quite similar.

Table 16: Descriptive statistics to test the effect of industry peer firms on voluntary disclosure

Panel A: Management Earnings Forecast Sample

	3-digit SIC Code Method					Text-based Network Industry Classification Method				
Variable	Mean	Median	25th Pctl	75th Pctl	Std Dev	Mean	Median	25th Pctl	75th Pctl	Std Dev
Freq	1.5968	0.0000	0.0000	2.0000	3.7545	1.6263	0.0000	0.0000	2.0000	3.6981
Peer_Freq	2.0309	1.3778	0.0476	3.0909	2.4172	2.0790	1.6452	0.2667	3.1667	2.1300
Horizon	156.6294	155.8333	70.0000	203.2500	104.5659	156.3935	155.7692	69.7500	203.5000	105.3312
Peer_Horizon	154.4948	152.5333	109.4213	198.3040	75.4189	154.0157	155.6164	101.6730	197.3810	70.5927
Earn_Predict	-2.6820	-2.6705	-3.9865	-1.3270	1.9952	-2.6852	-2.6740	-3.9888	-1.3273	1.9959
Nonsynch	-0.7481	-0.6413	-1.2542	-0.1487	0.9821	-0.7479	-0.6379	-1.2503	-0.1448	0.9860
Peer_Nonsynch	-0.7328	-0.8009	-1.1075	-0.4637	0.6981	-0.7593	-0.8168	-1.0744	-0.4879	0.5773
ERC	12.6599	5.4396	-0.2212	18.8905	26.7157	12.7467	5.4951	-0.1709	18.8710	26.6442
Ret_Vol	0.1240	0.1102	0.0769	0.1519	0.0663	0.1238	0.1097	0.0766	0.1518	0.0665
Inst_Owner	0.6830	0.7384	0.4916	0.8931	0.2844	0.7001	0.7499	0.5207	0.8995	0.2722
NO_Analyst	11.1285	9.0000	4.0000	16.0000	8.7275	11.1330	9.0000	4.0000	16.0000	8.7794
MEF_Cost	-8.9153	-9.2245	-9.9470	-8.0572	1.6095	-8.8791	-9.2217	-9.9366	-7.9233	1.6125
SIZE	7.3855	7.4051	6.1093	8.5622	1.8600	7.3610	7.3917	6.0999	8.5317	1.8425
ROA	-0.0007	0.0266	-0.0002	0.0682	0.1643	-0.0019	0.0261	0.0000	0.0666	0.1641
BTM	0.6569	0.5308	0.3108	0.8385	0.5907	0.6590	0.5333	0.3148	0.8403	0.5903
ΔEPS	-0.0410	0.0700	-0.4700	0.5400	2.1689	-0.0380	0.0700	-0.4700	0.5400	2.1863

Table 16: Descriptive statistics to test the effect of industry peer firms on voluntary disclosure – Continued

Panel B: Management Earnings Expectation Sample

	3-digit SIC Code Method					Text-based Network Industry Classification Method				
Variable	Mean	Median	25th Pctl	75th Pctl	Std Dev	Mean	Median	25th Pctl	75th Pctl	Std Dev
GoodNews	0.1798	0.0000	0.0000	0.0385	0.5009	0.1810	0.0000	0.0000	0.0394	0.5031
BadNews	-0.1414	-0.0069	-0.1443	0.0000	0.3053	-0.1424	-0.0070	-0.1496	0.0000	0.3070
Peer_GoodNews	0.2856	0.0997	0.0094	0.2846	2.1223	0.2855	0.1369	0.0308	0.3199	0.5815
Peer_BadNews	-0.1850	-0.1055	-0.2357	-0.0140	0.3920	-0.2108	-0.1000	-0.2284	-0.0284	1.6502
ERC	19.8005	11.8424	1.5786	31.3618	30.9051	15.8596	13.5556	7.5438	21.5770	17.4847
Peer_ERC	16.4646	13.5408	5.8004	24.8237	21.7962	19.7000	11.7429	1.5519	31.3056	30.8016
Ret_Vol	0.1062	0.0974	0.0694	0.1309	0.0498	0.1065	0.0979	0.0696	0.1314	0.0501
Inst_Owner	0.8074	0.8382	0.6914	0.9436	0.2123	0.8133	0.8407	0.6983	0.9445	0.2051
NO_Analyst	13.7956	12.0000	7.0000	19.0000	8.5385	13.7796	12.0000	7.0000	19.0000	8.5581
Growth	0.0948	0.0615	-0.0094	0.1491	0.2267	0.0937	0.0607	-0.0100	0.1484	0.2268
SIZE	7.6641	7.6060	6.4942	8.7712	1.7089	7.6609	7.6084	6.4942	8.7627	1.7075
Loss	0.1576	0.0000	0.0000	0.0000	0.3644	0.1583	0.0000	0.0000	0.0000	0.3651
ROA	0.0386	0.0493	0.0181	0.0861	0.1134	0.0379	0.0490	0.0178	0.0854	0.1130
BTM	0.5520	0.4616	0.2892	0.7020	0.4391	0.5541	0.4629	0.2910	0.7050	0.4399
ΔEPS	-0.0482	-0.4000	0.1100	0.5400	1.9699	-0.0445	0.1100	-0.4000	0.5500	1.9804

This table illustrates the descriptive statistics of sample variables. In the Panel A, the variables are used to test the relation between industry peer firms and the specific firm's issuance of MEF behaviors. In the Panel B, the variables are used to test the relation between industry peer firms and the specific firm's management earnings expectation. For the first five columns, the sample of peer firms is constructed based on the SIC 3-digit method. For the last five columns, the sample of peer firms is constructed based on the text-based network industry classification method.

6. Empirical Results

6.1 Univariate Tests

In this section, I discuss the peer effects on the firm's voluntary disclosure strategy. First, the Pearson Correlation results for the sample of Equation 13 and the sample of Equation 14 are described in the Table 17. In the Panel A, I find that the peer firm's disclosure frequency and disclosure horizon are significantly and positively correlated with the specific firm's disclosure frequency and disclosure horizon as expected. Moreover, I find the instrument variable, peer firms' earnings non-synchronicity (Peer_Nonsynch), is significantly associated with the endogenous variables, peer firms' disclosure frequency (Peer_Freq) and disclosure horizon (Peer_Horizon), and this suggests the relevance test is satisfied. And I also find that the Peer_Nonsynch is not significantly associated with the specific firm's disclosure frequency (Freq) and disclosure horizon (Horizon), and this suggests the excludability test is satisfied. In the Panel B, I find that the bad news disclosed by peer firms are significantly correlated with the bad news disclosed by the specific firm. In contrast, I don't find a significant correlation between good news disclosed by peer firms and good news disclosed by the specific firms. Moreover, I find that the instrument variable, peer firms' earnings response coefficient (Peer_ERC), is significantly correlated with the peer firms' good news and bad news and is not significantly correlated with the specific firm's good news and bad news. Hence, the relevance and excludability test of instrument is satisfied. In conclusion, the univariate test suggests that the peer firms' disclosure frequency, disclosure horizon and forecast of bad news will significantly influence the specific firm's corresponding voluntary disclosure behaviors. Then I will introduce the

results of multivariate regressions and all the standard errors presented in the multivariate regressions are adjusted for both firm-level and year-level clustering.

6.2 Peer Effects on the specific firm's MEF behaviors

This section instroduces the results of multivariate tests of the peer effects on the specific firm's MEF behaviors. In the Panel A of Table 18, I use the 3-digit SIC code method to define the industry peer firms. The first four columns display the OLS regression results and the last four columns display the 2SLS regression results. I find that peer firms' disclosure frequency of management earnings forecast (Peer_Freq), peer firms' disclosure horizon (Peer_Horizon), peer firms' disclosure frequency of short-horizon management earnings forecast (Peer_ Freq_SH), and peer firms' disclosure frequency of long-horizon management earnings forecast (Peer_Freq_SH) are significantly and positively correlated with the specific firm's disclosure frequency (coefficient=0.8642, P-value<0.0001), the specific firm's disclosure horizon (coefficient=1.0299, P-value<0.0001), the specific firm's disclosure frequency of short-horizon MEF (coefficient=0.9178, P-value<0.0001), and the specific firm's disclosure frequency of long-horizon MEF (coefficient=1.4503, P-value<0.0001).[13] This suggests that more frequency and longer horizon of MEF disclosed by its peer firms will encourage the specific firm to disclose more frequently and to disclose the MEF with longer horizon.

[5] All the numeric results presented in the section are obtained from the 2SLS regression.

Table 17: Pearson correlation to test the effect of industry peer firms on voluntary disclosure

Panel A: Management Earnings Forecast Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1)Freq	1															
(2)Peer_Freq	**0.2903**	1														
(3)Horizon	**0.0991**	**0.099**	1													
(4)Peer_Horizon	-0.003	**0.058**	**0.3057**	1												
(5)Earn_Predict	**0.0914**	**0.13**	0.0162	0.006	1											
(6)Nonsynch	**0.0628**	**0.097**	**0.0732**	0.015	**0.0551**	1										
(7)Peer_Nonsynch	0.0592	**0.131**	0.0119	**0.161**	**0.0543**	**0.499**	1									
(8)ERC	**0.1479**	**0.091**	**-0.032**	**-0.058**	**0.0643**	**0.065**	**0.0623**	1								
(9)Ret_Vol	**-0.165**	**-0.064**	**-0.15**	-0.022	**-0.153**	**-0.113**	**-0.028**	**-0.125**	1							
(10)Inst_Owner	**0.2094**	**0.121**	0.0015	**-0.059**	-6E-04	**0.077**	**0.147**	**0.1691**	**-0.13**	1						
(11)NO_Analyst	**0.1558**	**0.033**	**0.0511**	**-0.028**	**0.0214**	-0.012	-0.004	**0.1685**	**-0.182**	**0.3473**	1					
(12)MEF_Cost	**-0.09**	**-0.173**	**-0.052**	**0.11**	-0.008	4E-04	-3E-04	0.0145	**-0.119**	**-0.129**	**-0.174**	1				
(13)SIZE	**0.1139**	**-0.083**	**0.23**	**0.08**	**0.0269**	**-0.023**	**-0.024**	**0.0253**	**-0.382**	**0.2059**	**0.5598**	**0.0841**	1			
(14)ROA	**0.1261**	**0.038**	**0.0887**	**-0.064**	**0.0702**	**0.064**	**0.0517**	**0.1328**	**-0.379**	**0.2304**	**0.2013**	**0.0307**	**0.3586**	1		
(15)BTM	**-0.112**	**-0.118**	**-0.064**	**-0.034**	**-0.023**	**-0.101**	**-0.066**	**-0.109**	**0.11**	**-0.18**	**-0.2**	**0.2252**	**0.0405**	**-0.071**	1	
(16)ΔEPS	**0.0242**	6E-04	**0.0477**	**0.06**	**-0.038**	**-0.057**	**-0.036**	**-0.022**	**0.065**	**0.0414**	**0.0228**	**-0.038**	-0.001	**0.2263**	**-0.172**	1

Table 17: Pearson correlation to test the effect of industry peer firms on voluntary disclosure – Continued

Panel B: Management Earnings Expectation Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	**(17)**	(18)	(19)
(1)GoodNews	1																		
(2)BadNews	**0.1664**	1																	
(3)Peer_GoodNew	-0.006	0.018	1																
(4)Peer_BadNews	0.0044	**0.058**	0.0179	1															
(5)ERC	**0.0366**	**0.029**	-0.005	-0.011	1														
(6)Peer_ERC	0.0024	**0.023**	-0.021	**0.116**	**0.0841**	1													
(7)Ret_Vol	-0.004	**-0.185**	-0.026	**-0.104**	**-0.095**	**0.062**	1												
(8)Inst_Owner	0.005	**0.063**	-0.027	-0.017	**0.154**	**0.096**	-0.016	1											
(9)NO_Analyst	0.0105	**0.111**	-0.023	0.009	**0.1099**	0.014	**-0.132**	**0.1466**	1										
(10)Growth	**0.0541**	**0.093**	0.0077	0.015	**0.0474**	-0.009	-0.032	**0.1136**	**0.101**	1									
(11)Labor_Intense	**-0.045**	**-0.054**	**-0.038**	**-0.105**	**0.0966**	**0.167**	**0.103**	**0.1083**	**0.117**	**0.1355**	1								
(12)Litigation	0.0273	**-0.039**	-0.009	**-0.057**	**0.0446**	0.03	**0.1455**	-0.019	**0.198**	0.0203	**0.2068**	1							
(13)Durable	-0.02	-0.019	-0.022	0.003	0.0276	0.015	**0.1415**	**0.0998**	**0.058**	**0.0356**	**0.2322**	**0.1063**	1						
(14)SEO	0.0144	-0.007	0.0018	0.002	-0.002	0.017	-0.002	0.0281	**-0.051**	0.0251	-0.015	0.0094	0.033	1					
(15)SIZE	**-0.047**	**0.186**	0.0015	**0.09**	-0.034	**-0.141**	**-0.427**	0.0073	**0.537**	0.0237	**-0.112**	**-0.188**	**-0.132**	-0.02	1				

Table 17: Pearson correlation to test the effect of industry peer firms on voluntary disclosure – Continued

(16)Loss	-0.004	**-0.282**	-0.02	**-0.057**	**-0.094**	0.024	**0.3232**	**-0.09**	**-0.126**	**-0.211**	**0.0662**	**0.1039**	**0.0563**	-0.005	**-0.228**	1			
(17)ROA	**0.0342**	**0.192**	0.0053	0.028	**0.1224**	-0.021	**-0.263**	**0.1399**	**0.165**	**0.2982**	-0.014	**-0.058**	-0.029	0.0051	**0.168**	**-0.634**	1		
(18)BTM	**-0.084**	**-0.227**	-0.018	-0.026	**-0.127**	**-0.049**	**0.211**	**-0.079**	**-0.21**	**-0.171**	-0.032	**-0.102**	**-0.055**	**0.038**	-0.01	**0.3113**	**-0.356**	1	
(19)ΔEPS	**0.0545**	**0.159**	-0.019	-0.01	-0.031	0.005	-0.005	0.0349	**0.046**	**0.163**	0.0157	**0.0439**	0.0286	0.0041	0.005	**-0.374**	**0.4152**	**-0.281**	1

This table illustrates the Pearson correlation to test the relation between peers' MEF behaviors and the specific firm's MEF behaviors. Bold firgures indicate that the correlations are significant at 5 percent level.

Table 18: the effect of peer firms' MEF characteristics on the specific firm's MEF characteristics

Panel A: The SIC 3 digit industry peer firms

	OLS Regression								2SLS Regression							
	Depedent = Freq		Depedent = Horizon		Depedent = Freq_SH		Depedent = Freq_LH		Depedent = Freq		Depedent = Horizon		Depedent = Freq_SH		Depedent = Freq_LH	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	-2.63472	<.0001	190.2295	0.0301	-1.0159	0.004	-1.63763	<.0001	-2.42681	<.0001	1.31969	0.9875	-1.00586	0.0046	-1.96237	0.0016
Peer_Freq	0.132425	<.0001							0.86419	<.0001						
Peer_Horizon			0.08256	0.0187							1.02992	<.0001				
Peer_Freq_SH					0.076291	0.0001							0.917794	<.0001		
Peer_Freq_LH							0.151895	<.0001							1.450333	<.0001
Earn_Predict	0.000511	0.0757	-0.79542	0.4298	0.000859	0.0187	-0.00063	0.9546	0.016724	0.3266	-0.653	0.4929	0.003433	0.6854	0.042923	0.0126
Nonsynch	0.10491	0.0123	10.27869	0.0002	0.011285	0.0522	0.09275	0.0025	0.052212	0.0211	8.51344	0.0013	0.000642	0.0709	0.021475	0.0036
ERC	0.007402	<.0001	-0.02084	0.7002	0.003657	<.0001	0.003722	<.0001	0.007607	<.0001	-0.0124	0.8092	0.003701	<.0001	0.008972	<.0001
Ret_Vol	-3.55573	<.0001	82.00868	0.0974	-1.42974	<.0001	-2.13172	<.0001	-4.362	<.0001	39.6158	0.4188	-2.0965	<.0001	-4.35992	<.0001
Inst_Owner	1.196147	<.0001	15.59663	0.1736	0.61764	<.0001	0.577591	<.0001	1.279357	<.0001	14.8612	0.1628	0.640881	<.0001	1.387528	<.0001
NO_Analyst	0.013011	0.0273	-1.07416	0.0001	0.016174	<.0001	-0.00284	0.4659	0.008023	0.1802	-1.2064	<.0001	0.014476	<.0001	0.002508	0.6804
MEF_Cost	0.054696	0.2826	10.53715	0.0393	-0.01965	0.4744	0.069972	0.0303	0.079393	0.1222	12.079	0.0041	-0.01347	0.6225	0.10652	0.0428
SEO	0.916173	0.0033	57.95678	<.0001	0.323869	0.1047	0.592084	0.0005	1.014236	0.0014	69.5695	<.0001	0.354251	0.0831	0.965519	0.0021
SIZE	0.247869	<.0001	12.29649	<.0001	0.021985	0.1303	0.223293	<.0001	0.250888	<.0001	12.5814	<.0001	0.01975	0.1759	0.26009	<.0001
ROA	0.807495	<.0001	36.78359	0.1792	0.414899	<.0001	0.396603	0.0003	0.690183	<.0001	33.8477	0.1929	0.334948	0.0006	0.474839	0.0065
BTM	0.016653	0.7071	-12.3313	0.069	-0.00222	0.9217	0.022088	0.4387	-0.09838	0.0199	-16.394	0.0124	-0.03229	0.1481	-0.04943	0.2343
ΔEPS	0.028831	0.0215	1.3725	0.3149	0.013495	0.0379	0.015403	0.0609	0.041394	0.0008	1.6935	0.1949	0.015898	0.0128	0.029619	0.0163
First Stage Multivariate F-Stat									36.9***		18.1***		5.21***		81.88***	
Industry Fixed Effe	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Observations	9,336		2,528		9,336		9,336		9,336		2,528		9,336		9,336	
Adjusted R-square	0.2167		0.2226		0.2271		0.192		0.1936		0.2087		0.2166		0.1936	

Table 18: the effect of peer firms' MEF characteristics on the specific firm's MEF characteristics – Continued

Panel B: The text-based network classification of industry peer firms

	OLS Regression								2SLS Regression							
	Depedent = Freq		Depedent = Horizon		Depedent = Freq_SH		Depedent = Freq_LH		Depedent = Freq		Depedent = Horizon		Depedent = Freq_SH		Depedent = Freq_LH	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	-3.21407	<.0001	36.89854	0.6442	-1.08121	0.0016	-2.11443	<.0001	-2.65293	<.0001	-6.1716	0.9417	-0.84662	0.0208	-2.3052	0.0004
Peer_Freq	0.6994	<.0001							0.857548	<.0001						
Peer_Horizon			0.54455	<.0001							0.9808	<.0001				
Peer_Freq_SH					0.681016								0.925577	<.0001		
Peer_Freq_LH							0.654336	<.0001							1.297172	<.0001
Earn_Predict	0.009131	0.0509	-0.07127	0.9375	0.001222	0.0793	0.007571	0.0488	0.01321	0.0328	-1.0299	0.2907	0.00446	0.061	0.025948	0.0126
Nonsynch	0.130162	0.0004	6.41981	0.0026	0.027546	0.0982	0.10387	<.0001	0.078117	0.038	7.53708	0.0073	0.01027	0.0627	0.061709	0.0046
ERC	0.00645	<.0001	0.0012	0.9816	0.003151	<.0001	0.003346	0.0002	0.007837	<.0001	0.00019	0.9971	0.003719	<.0001	0.008346	<.0001
Ret_Vol	-1.70958	0.0006	-25.2311	0.6003	-0.77688	0.0022	-1.03319	0.0022	-4.47265	<.0001	61.5081	0.2285	-2.20276	<.0001	-5.01186	<.0001
Inst_Owner	0.688114	<.0001	20.9828	0.0356	0.341173	<.0001	0.354041	<.0001	0.979278	<.0001	10.5246	0.3696	0.524413	<.0001	1.034573	<.0001
NO_Analyst	0.010083	0.0794	-0.92001	0.0008	0.011053	0.0003	-0.00114	0.7676	0.004515	0.4698	-1.2177	<.0001	0.013668	<.0001	0.001185	0.8508
MEF_Cost	-0.05918	0.2385	2.55744	0.3708	-0.032	0.252	-0.02075	0.5039	0.082103	0.121	11.4897	0.0073	-0.01672	0.5513	0.120977	0.0248
SEO	0.825496	0.0054	60.87802	0.0023	0.376351	0.0634	0.462625	0.0063	1.122871	0.0013	65.271	<.0001	0.317119	0.136	1.179117	0.0006
SIZE	0.241928	<.0001	9.29428	<.0001	0.052558	0.0008	0.193336	<.0001	0.294104	<.0001	12.8517	<.0001	0.034781	0.0395	0.290114	<.0001
ROA	0.8272	<.0001	35.68548	0.0379	0.400475	<.0001	0.428782	0.0001	0.787542	<.0001	39.234	0.1312	0.377642	0.0002	0.732495	<.0001
BTM	0.020915	0.6356	-9.14823	0.1254	-0.01018	0.6551	0.029227	0.3167	-0.14266	0.0011	-15.745	0.0156	-0.04846	0.0369	-0.18481	<.0001
ΔEPS	0.019989	0.0971	0.99959	0.4038	0.00918	0.1383	0.011094	0.1682	0.041645	0.0011	1.56957	0.2376	0.016095	0.0145	0.041572	0.0011
First Stage Multivariate F-Stat									34.15***		36.87***		4.29**		104.22***	
Industry Fixed Effe	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Observations	8,866		2,392		8,866		8,866		8,866		2,392		8,866		8,866	
Adjusted R-square	0.2456		0.2408		0.2743		0.2265		0.2598		0.2554		0.2783		0.2329	

This table illustrates the effect of industry peer firms on the specific firm's voluntary disclosure strategy. In the Panel A, the sample of peer firms is constructed based on the SIC 3-digit method. In the Panel B, the smaple of peer firms is constructed based on the text-based network classficiation of industry peer firms. For the first eight columns, the tests are implemented using the OLS regression method. For the last eight columns, the tests are implemented using the 2SLS regression method and the instrument is the peer firms' earnings nonsynchronicity.

In the Panel B of Table 18, I use the text-based network classification method developed by Hoberg and Phillips (2010, 2015) and I find the similar results. Specifically, the specific firm's disclosure frequency, disclosure horizon, disclosure frequency of short-horizon MEF, and disclosure frequency of long-horizon MEF are significantly influenced by its peer firms' disclosure frequency (coefficient=0.8575, P-value<0.0001), peer firms' disclosure horizon (coefficient=0.9808, P-value<0.0001), peer firms' disclosure frequency of short-horizon MEF (coefficient=0.9256, P-value<0.0001), and peer firms' disclosure frequency of long-horizon MEF (coefficient=1.2972, P-value<0.0001). In conclusion, I find that the existence of peer effects in the firm's disclosure strategy through using alternative measurement methods and different regressions. Specifically, the firm's disclosure frequency and disclosure horizon are significantly influenced by its peer firms' disclosure frequency and disclosure horizon.

6.3 Peer Effects on the specific firm's management earnings expectations.

In this section, I discuss the effect of peer firms' management earnings expectations on the specific firm. The Table 19 shows the results of multivariate regressions. The first two columns and the last two columns respectively show the results of OLS regression and the results of 2SLS regression. In the Panel A and Panel B, I respectively use the 3-digit SIC code method and the text-based networking industry classification method to define the industry peer firms. Under both industry classification methods, I find that the bad news disclosed by peer firms is significantly and positively correlated with the bad news disclosed by the specific firm (3-digit SIC code method: coefficient=0.4225, P-value<0.0001; text-based network classification method: coefficient= 0.0975, P-value=0.0025). Although in some OLS regression tests, I find that

the peer firms' good news is positively and significantly correlated with the specific firm's good news, I don't find a significant correlation between peer firm's good news and specific firm's good news after I include the instrument and use the 2SLS regression to solve the endogeneity problem. This suggests that the specific firm tends to disclose bad news if its peers disclose more bad news and it's not true for the disclosure of good news. One possible explanation is that the bad news is more likely to be influenced by the macro economy and the good news is more likely to be influenced by the firm's specific characteristics. If most of the industry peer firms have the pessimistic expectation of future earnings, due to the conservatism and litigation risk the specific firm may also tend to disclose the bad news even if the firm still has good operations (such as the herding theory of bad news in Floyd, 2012). In contrast, if most of the industry peer firms have the optimistic expectation of future earnings, the specific firm may not follow the disclosure of good news if it doesn't have good operations. In conclusion, the robust results suggest that the bad news disclosed by peer firms may encourage the specific firm to disclose bad news and the good news disclosed by peer firms will not encourage the specific firm to disclose good news.

6.4 The effect of change in disclosure strategy

In this section, I investigate how the changes in disclosure strategy of peer firms will influence the changes in disclosure strategy of the specific firm. The change in disclosure strategy is measured as the first difference between the current period disclosure strategy and the prior period disclosure strategy. The Table 20 illustrates the effect of changes in peer firms' management earnings forecast on the changes in the specific firms' management earnings forecast.

Table 19: the effect of peer firms' management earnings expectation on the specific firm's management earnings expectation

Panel A: The 3-digit SIC industry peer firms

	OLS Regression				2SLS Regression			
	Dependent=GoodNews		Dependent=BadNews		Dependent=GoodNews		Dependent=BadNews	
Intercept	0.0842338	0.6079	-0.08909	0.1852	1.0408933	0.1409	-0.05256	0.405
Peer_GoodNews	-0.0014	0.1457			-0.499547	0.5328		
Peer_BadNews			0.0254128	0.0138			0.42248	<.0001
ERC	0.0001967	0.0651	0.0000341	0.0308	0.0006028	0.0784	0.000057	0.0776
Ret_Vol	0.2156691	0.3842	-0.476	0.004	-0.150987	0.5355	-0.40209	0.008
Inst_Owner	0.0297542	0.5386	0.0671027	0.0245	-0.058584	0.2611	0.056725	0.0372
NO_Analyst	0.0011286	0.5719	-0.001715	0.0314	0.0017654	0.361	-0.00099	0.1915
Growth	0.0897644	0.0576	0.042312	0.0627	0.1224598	0.0054	0.046878	0.0293
Litigation	-0.012919	0.5662	0.0059736	0.6245	0.0621903	0.0332	0.010675	0.3629
Durable	-0.03478	0.0831	0.0080263	0.4972	-0.038245	0.6397	0.000222	0.9839
SEO	0.1907323	<.0001	-0.02337	0.4013	0.1982163	0.0151	0.024344	0.3735
SIZE	-0.008579	0.2999	0.0219955	<.0001	-0.006805	0.4473	0.016837	0.0008
Loss	0.0694179	0.0304	-0.155203	<.0001	0.0791254	0.0103	-0.14983	<.0001
Leverage	-0.10732	0.0522	0.0958619	0.0095	-0.12249	0.0604	0.080883	0.0218
ROA	0.0333245	0.7778	-0.139204	0.2091	-0.083986	0.4473	-0.12349	0.228
BTM	-0.076015	0.0042	-0.103128	<.0001	-0.093176	0.0005	-0.10359	<.0001
ΔEPS	0.0136164	0.0298	0.0099493	0.0339	0.0143376	0.0118	0.007479	0.066
First Stage Multivariate F-Stat					3.34**		5.81***	
Industry Fixed Effe	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	3,116		3,116		3,116		3,116	
Adjusted R-square	0.0708		0.1353		0.0801		0.1459	

Table 19: the effect of peer firms' management earnings expectation on the specific firm's management earnings expectation - Continued

Panel B: The text-based network classification of industry peer firms

	OLS Regression				2SLS Regression			
	Dependent=GoodNews		Dependent=BadNews		Dependent=GoodNews		Dependent=BadNews	
Intercept	0.6671828	0.2134	-0.176936	0.0127	0.7009121	0.1916	-0.0632	0.3293
Peer_GoodNews	0.0875694	0.0001			0.9563532	0.1002		
Peer_BadNews			0.0028577	0.0207			0.097499	0.0025
ERC	0.0006632	0.0581	-4.52E-05	0.0759	0.0007104	0.0459	-3.4E-05	0.0279
Ret_Vol	-0.223908	0.2739	-0.152341	0.3171	-0.153557	0.5332	-0.50092	0.0015
Inst_Owner	-0.044268	0.4405	0.0629462	0.0426	-0.049586	0.39	0.049307	0.0931
NO_Analyst	0.001406	0.479	-0.000894	0.2795	0.002045	0.3038	-0.00103	0.1855
Growth	0.1125647	0.0106	0.0433462	0.052	0.1235303	0.0065	0.042195	0.0478
Litigation	0.07641	0.009	-0.015265	0.5142	0.0726822	0.0134	0.001245	0.9183
Durable	-0.020517	0.8079	-0.01975	0.5616	-0.03607	0.6649	0.013561	0.2243
SEO	0.1871392	0.0193	0.0645828	0.0954	0.1648884	0.0492	-0.01238	0.6527
SIZE	-0.009696	0.2758	0.0228622	<.0001	-0.00969	0.2953	0.018718	0.0003
Loss	0.0922503	0.0045	-0.148346	<.0001	0.0808876	0.0107	-0.16141	<.0001
Leverage	-0.130843	0.0517	0.0653003	0.0941	-0.125226	0.0592	0.086112	0.0174
ROA	-0.104085	0.3667	-0.131834	0.2304	-0.081872	0.4752	-0.14781	0.1682
BTM	-0.092616	0.001	-0.106016	<.0001	-0.092748	0.0008	-0.0987	<.0001
ΔEPS	0.0148496	0.0095	0.0087819	0.0355	0.0142429	0.0141	0.007871	0.0562
First Stage Multivariate F-Stat					5.59**		7.82***	
Industry Fixed Effe	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	3,020		3,020		3,020		3,020	
Adjusted R-square	0.0884		0.1673		0.0879		0.1503	

This table illustrates the effect of industry peer firms on the specific firm's management earnings expecations In the Panel A and the Panel B, I respectively use the SIC 3-digit method and the text-based network industry classification method to define the industry peer firms. In the first and third column, the dependent variables are the good news disclosed by the specific firm. In the second and the fourth column, the dependent variables are the bad news disclosed by the specific firm. For the first two columns of regressions, I implement the OLS regression method. For the last two columns of regressions, I implement the 2SLS method and the instrument is the peer firms' ERC.

Table 20: the effect of peer firms' MEF change on the specific firm's MEF change

Panel A: The SIC 3 digit industry peer firms

	2SLS Regression							
	Depedent =ΔFreq		Depedent = ΔHorizon		Depedent = ΔFreq_SH		Depedent = ΔFreq_LH	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	0.638766	0.1777	20.993669	0.8573	0.381935	0.1628	0.2639997	0.3683
ΔPeer_Freq	1.0338355	<.0001						
ΔPeer_Horizon			0.435722	<.0001				
ΔPeer_Freq_SH					1.0860256	<.0001		
ΔPeer_Freq_LH							1.0170605	<.0001
Earn_Predict	0.0084704	0.5107	0.723325	0.4073	0.0024516	0.7185	0.0059374	0.512
Nonsynch	0.0293254	0.0876	0.744591	0.0974	0.0043046	0.0454	0.0335467	0.0141
ERC	0.0014371	0.187	0.054981	0.2735	0.000696	0.2562	0.0007396	0.305
Ret_Vol	1.6162085	<.0001	26.312281	0.5949	1.0520476	<.0001	0.5975527	0.007
Inst_Owner	-0.283822	0.001	-2.949755	0.7295	-0.152659	0.0015	-0.131372	0.0251
NO_Analyst	-0.01173	0.0098	-0.160002	0.5227	-0.006527	0.0073	-0.005165	0.0936
MEF_Cost	-0.022002	0.5954	-0.416391	0.8788	0.008831	0.7189	-0.030994	0.2493
SEO	-0.343017	0.1383	26.042576	0.1129	-0.143354	0.3212	-0.200647	0.0755
SIZE	-0.046177	0.047	2.111315	0.2407	-0.005785	0.6054	-0.040289	0.0203
ROA	0.247771	0.0738	15.804764	0.4706	0.1047484	0.1984	0.1465754	0.1153
BTM	-0.124468	0.0005	-1.414012	0.8154	-0.090951	<.0001	-0.03332	0.1624
ΔEPS	0.0145432	0.1508	0.323589	0.7794	0.0052547	0.3249	0.0093385	0.2136
First Stage Multivariate F-Stat	27.23***		14.38***		18.71***		17.59***	
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	9,336		2,528		9,336		9,336	
Adjusted R-square	0.074		0.0503		0.0567		0.0562	

Table 20: the effect of peer firms' MEF change on the specific firm's MEF change – Continued

Panel B: The text-based network classification of industry peer firms

	2SLS Regression							
	Depedent =ΔFreq		Depedent = ΔHorizon		Depedent = ΔFreq_SH		Depedent = ΔFreq_LH	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	0.8884607	0.136	21.99541	0.8516	0.2863032	0.3953	0.6073113	0.1109
ΔPeer_Freq	0.9432476	<.0001						
ΔPeer_Horizon			0.386371	<.0001				
ΔPeer_Freq_SH					0.9748648	<.0001		
ΔPeer_Freq_LH							0.9592732	<.0001
Earn_Predict	0.0118723	0.4478	0.408596	0.6486	0.003238	0.6993	0.0091749	0.3987
Nonsynch	0.0374223	0.0258	1.090936	0.0725	0.0076483	0.0468	0.0447096	0.0119
ERC	0.00167	0.1851	0.048537	0.3528	0.0008862	0.211	0.0007986	0.3406
Ret_Vol	1.7704142	<.0001	50.086376	0.323	1.1730022	<.0001	0.6317619	0.0135
Inst_Owner	-0.159378	0.1758	-0.132159	0.9887	-0.100365	0.1203	-0.062236	0.4434
NO_Analyst	-0.013017	0.0239	-0.175141	0.4938	-0.007333	0.0186	-0.005466	0.1604
MEF_Cost	-0.025221	0.607	0.306508	0.9127	0.0058039	0.8423	-0.032417	0.3089
SEO	-0.387387	0.1879	27.679093	0.1007	-0.152687	0.3951	-0.23625	0.1187
SIZE	-0.078081	0.0137	2.409911	0.1952	-0.016187	0.2929	-0.062023	0.0084
ROA	0.2256765	0.1727	18.226239	0.4166	0.0872383	0.3657	0.1428393	0.2012
BTM	-0.142034	0.0005	-2.828855	0.6436	-0.099736	<.0001	-0.039113	0.1501
ΔEPS	0.0133166	0.2593	0.295306	0.8023	0.0056848	0.3678	0.007392	0.3989
First Stage Multivariate F-Stat	8.81***		4.01**		4.68**		21.50***	
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	8,866		2,392		8,866		8,866	
Adjusted R-square	0.0753		0.0469		0.0551		0.0598	

This table illustrates the effect of peer firms' MEF change on the changes in the specific firm's MEF behaviors. In the Panel A and Panel B, the SIC 3-digit method and the text-based network industry classification method are respectively used to define the industry peer firms. The dependent variables for each column are respectively the changes in the specific firm's disclosure frequency, the changes in the specific firm's disclosure horizon, the changes in the specific firm's disclosure frequency of short-horizon MEF, and the changes in the specific firm's disclosure frequency of long-horizon MEF.

In the Panel A and the Panel B, I respectively use the 3-digit SIC code method and the text-based network classification method to define the industry peer firms. And using the 2SLS regressions, I find the results consistent with the main conclusions. I find that the changes in the peer firms' disclosure frequency, the changes in the peer firms' disclosure horizon, the changes in the peer firms' disclosure frequency of short-horizon MEF, and the changes in the peer firm's disclosure frequency of long-horizon MEF are significantly and positively correlated with the specific firm's disclosure frequency (3-digit SIC code method: coefficient=1.0338, P-value<0.0001; text-based network classification method: coefficient=0.8885, P-value<0.0001), the specific firm's disclosure horizon (3-digit SIC code method: coefficient=0.4357, P-value<0.0001; text-based network classification method: coefficient=0.3864, P-value<0.0001), the specific firm's disclosure frequency of short-horizon MEF (3-digit SIC code method: coefficient=1.0860, P-value<0.0001; text-based network classification method: coefficient=0.9749, P-value<0.0001), and the specific firm's disclosure frequency of long-horizon MEF (3-digit SIC code method: coefficient=1.0171, P-value<0.0001; text-based network classification method: coefficient=0.9593, P-value<0.0001). This suggests that the firm tends to increase its disclosure frequency and disclosure horizon of management earnings forecast, if its industry peer firms increase the MEF disclosure frequency and disclosure horizon. In conclusion, the alternative tests of changes in disclosure strategy suggests that the specific firm's disclosure frequency and disclosure horizon are significantly influenced by its industry peer firms' corresponding disclosure behaviors.

The Table 21 illustrates how the changes in peer firms' management earnings expectations will influence the specific firms' management earnings expectations. In the Panel A, I calculate the industry peer firms' variables by using the 3-digit SIC code method. Consistent with my main conclusion, I find that the changes in the bad news disclosed by peer firms are significantly and positively correlated with the changes in the bad news disclosed by peer firms (coefficient=0.2786 and P-value=0.0005) and I don't find a significant correlation between the changes in the peer firms' good news and the changes in the peer firms' good news. In the Panel B, I use the text-based network classification method to measure the industry peer firms and find similar results. The results suggest that the specific firm tends to increase the level of bad news disclosed to the public, when its industry peer firms increase their disclosure level of bad news, and that the specific firm's disclosure level of good news is not influenced by the changes of their industry peer firms' good news disclosure level.

In conclusion, in this section, I test how the changes in disclosure strategy of peer firms will influence the changes in disclosure strategy of a specific firm. Consistent with the main results, I find that the specific firm's change in disclosure frequency, disclosure horizon, and disclosure of bad news are significantly and positively correlated with its industry peer firms' corresponding disclosure changes.

Table 21: the effect of peer firms' management earnings expectation change on the specific firm's management earnings expectation change

Panel A: The SIC 3 digit industry peer firms

	2SLS Regression			
	Dependent=ΔGoodNews		Dependent=ΔBadNews	
	Coefficient	P-value	Coefficient	P-value
Intercept	0.1887707	0.0146	-0.2292384	0.0004
ΔPeer_GoodNews	-0.016796	0.7939		
ΔPeer_BadNews			0.2786148	0.0005
ERC	0.0004298	0.0503	0.0000297	0.0479
Ret_Vol	-0.382897	0.069	-0.3456337	0.0333
Inst_Owner	-0.002531	0.9619	0.0361121	0.2057
NO_Analyst	0.0024184	0.2428	-0.0006883	0.3555
Growth	0.1281452	0.0091	0.0341769	0.1087
Litigation	-0.01158	0.6246	-0.0126312	0.275
Durable	-0.050352	0.0139	0.0023287	0.8319
SEO	0.2134189	<.0001	-0.0160464	0.5734
SIZE	-0.022392	0.0065	0.0227931	<.0001
Loss	0.0212153	0.4775	-0.1349977	<.0001
Leverage	-0.093184	0.1195	0.0904437	0.0109
ROA	-0.017159	0.8899	0.024949	0.8299
BTM	-0.071187	0.0097	-0.0763251	0.0003
ΔEPS	0.0089597	0.1359	0.0041056	0.3403
First Stage Multivariate F-Stat	3.16*		5.27**	
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Observations	3,116		3,116	
Adjusted R-square	0.0583		0.1444	

Table 21: the effect of peer firms' management earnings expectation change on the specific firm's management earnings expectation change – Continued

Panel B: The text-based network classification of industry peer firms

	2SLS Regression			
	Dependent=ΔGoodNews		Dependent=ΔBadNews	
	Coefficient	P-value	Coefficient	P-value
Intercept	0.2184526	0.0052	-0.2159674	0.0006
ΔPeer_GoodNews	-0.079291	0.3253		
ΔPeer_BadNews			0.0412807	0.0291
ERC	0.0004144	0.0816	0.0000535	0.0365
Ret_Vol	-0.478701	0.0213	-0.3017149	0.0645
Inst_Owner	-0.018596	0.7482	0.0362579	0.2299
NO_Analyst	0.002199	0.3044	-0.000728	0.3489
Growth	0.133898	0.0071	0.0344655	0.1116
Litigation	0.0041032	0.8682	-0.0107167	0.3806
Durable	-0.047088	0.025	0.0093585	0.4016
SEO	0.2137789	<.0001	-0.0221478	0.3029
SIZE	-0.023087	0.0067	0.0223844	<.0001
Loss	0.0134482	0.6466	-0.1390491	<.0001
Leverage	-0.102423	0.0927	0.0840202	0.0227
ROA	-0.045837	0.7133	0.0113039	0.9241
BTM	-0.082584	0.0016	-0.0796652	0.0002
ΔEPS	0.0090633	0.1363	0.0058202	0.1857
First Stage Multivariate F-Stat	3.92**		5.93**	
Industry Fixed Effect	Yes		Yes	
Year Fixed Effect	Yes		Yes	
Observations	3,020		3,020	
Adjusted R-square	0.0614		0.1455	

This table illustrates the effect of peer firms' changes in the management earnings expecation on the specific firm's changes in the management earnings expecation. In the Panel A and B, the SIC 3-digit method and text-based industry classification method are respectively implemented to define the industry peer firms. For the first columns of regressions, the dependent variables are good news. And for the last columns of regressions, the dependent variables are bad news.

7. Additional Tests

7.1 Which firms are more sensitive to peers' Disclosure Strategy?

This section discuss whether certain firms are more sensitive to their peers' disclosure strategy compared to other firms. I specifically examine which firms are more sensitive to peers' disclosure frequency, disclosure horizon, and disclosure of bad news. Because the tests mentioned above show that the R-squares of tests using text-based network classification method are slightly larger than the R-squares of tests using 3-digit SIC code method and the former industry classification method can provide instinct peer firms for each firm in each year, in this section my results are presented based on the sample using the text-based network classification method[14]. To test which firms are more sensitive to peers, I classify sample firms into different groups. First, I classify the sample firms based on whether the firm has the S&P credit rating. If the answer is yeas, the dummy variable, Rating_Firm, is equal to one and otherwise zero. Second, the sample firms are distinguished based on their profitability, size and risk. If the sample firm's profitability, size and market-to-book (MTB) ratio are within the top 25 percentile within each industry, the firm will be classified as high profitable, large size and high MTB firm and thus the dummy variables (Profit_Firm, Large_Firm and MTB_Firm) are equal to one. If the sample firm's profitability, size and market-to-book (MTB) ratio are within the bottom 25 percentile, the firm will be classified as low profitable, small size and low MTB firm and thus the dummy variables (Profit_Firm, Large_Firm and MTB_Firm) are equal to zero. I also construct corresponding interaction terms between the peer firms'

[6] The untabulated results suggest the similar conclusions based on the sample using the 3-digit SIC code method.

disclosure frequency/horizon/bad news and the group identifications (rating, profitability, size, and MTB ratio). The Table 22 describes the main results of 2SLS regressions.[15] In the Panel A, I investigate whether certain firms are more sensitive to mimic the peers' disclosure frequency. Using the peer firms' earnings non-synchronicity as the instrument, I find that the interaction term between peer firms' disclosure frequency and whether it's a rating firm is significant positive (coefficient=0.4599, P-value<0.0001). This suggests that rating firms are more sensitive to their industry peer firms' disclosure frequency compared to non-rating firms. Second, I find that the interaction between peer firms' disclosure frequency and whether it's a profitable firm is significant positive (coefficient=0.4556, P-value<0.0001). This suggests that more profitable firms are more sensitive to their industry peer firm's disclosure frequency compared to less profitable firms. Third, I find that the interaction tern between peer firms' disclosure frequency and whether it's a large firm is significant positive (coefficient=0.4955, P-value<0.0001). This suggests that larger firms are more sensitive to peer firms' disclosure frequency compared to smaller firms. Finally, I find that the interaction term between peer firms' disclosure frequency and whether it's a high MTB ratio firm is significant positive (coefficient=0.5489, P-value<0.0001). This suggests that firms with high MTB ratio are more sensitive to their industry peer firms' disclosure frequency compared to firms with lower MTB ratio.

[7] The tabulated results are based on the characteristics of disclosure strategy. I also test the interaction terms by using the changes in disclosure strategy. The untabulated results suggest the similar conclusions.

Table 22: Which firms are more sensitive to peers' voluntary disclosure strategy?

Panel A: which firms are more sensitive to mimic the peers' disclosure frequency

	2SLS Regression: Dependent = Freq							
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	-2.129565	0.001	-0.710079	0.3684	-0.833579	0.3825	-0.7502	0.3783
Peer_Freq	0.438116	<.0001	0.455552	<.0001	0.4955315	<.0001	0.548931	<.0001
Peer_Freq*Rating_Firm	0.459937	<.0001						
Rating_Firm	-0.807854	<.0001						
Peer_Freq*Profit_Firm			0.455552	<.0001				
Profit_Firm			0.968195	<.0001				
Peer_Freq*Large_Firm					0.4955315	<.0001		
Large_Firm					0.7777035	<.0001		
Peer_Freq*MTB_Firm							0.548931	<.0001
MTB_Firm							0.435088	<.0001
Earn_Predict	0.011794	0.4838	0.031722	0.2254	0.0429859	0.1002	0.032873	0.1469
Nonsynch	0.083107	0.028	0.085542	0.1572	0.0370925	0.0353	0.031917	0.0172
ERC	0.007835	<.0001	0.005669	0.0132	0.0027349	0.234	0.005033	0.0078
Ret_Vol	-4.273837	<.0001	-5.224828	<.0001	-4.524025	<.0001	-5.2686	<.0001
Inst_Owner	0.971642	<.0001	0.378971	0.0486	0.8718327	<.0001	0.336363	0.0529
NO_Analyst	0.005225	0.4033	-0.0114	0.1677	-0.002359	0.7923	-0.00213	0.7845
MEF_Cost	0.085084	0.1084	0.105203	0.1895	0.1330008	0.0908	0.181553	0.002
SEO	1.154652	0.001	0.850851	0.0354	1.2786252	0.0027	0.795326	0.1405
SIZE	0.295526	<.0001	0.324914	<.0001	0.3313783	<.0001	0.280525	<.0001
ROA	0.783911	<.0001	0.260866	0.2935	0.9269149	<.0001	0.872339	<.0001
BTM	-0.139957	0.0015	-0.219089	<.0001	-0.272741	<.0001	-0.01802	0.7193
ΔEPS	0.042167	0.0009	0.01437	0.354	0.0190564	0.2801	0.037761	0.0109
First Stage Multivariate F-State					34.15***			
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	8,866		4,339		4,380		4,397	
Adjusted R-square	0.2801		0.2796		0.2507		0.2581	

Panel B: which firms are more sensitive to mimic the peers' disclosure horizon

	2SLS Regression: Dependent = Horizon							
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	13.13682	0.8777	2.69235	0.9865	31.80793	0.806	-86.1505	0.5241
Peer_Horizon	0.90915	0.0006	1.14807	0.0006	0.83012	0.0045	1.26641	0.0003
Peer_Horizon*Rating_Firm	0.08184	0.6777						
Rating_Firm	-23.99255	0.4193						
Peer_Horizon*Profit_Firm			-0.06874	0.7219				
Profit_Firm			16.46699	0.5434				
Peer_Horizon*Large_Firm					0.02601	0.8994		
Large_Firm					26.16575	0.4916		
Peer_Horizon*MTB_Firm							-0.03387	0.8615
MTB_Firm							25.96184	0.3735
Earn_Predict	-1.03783	0.2864	-2.30685	0.1909	-3.15647	0.0796	-1.59168	0.3539
Nonsynch	7.39782	0.0094	12.04433	0.0096	13.95709	0.0022	2.37894	0.0055
ERC	0.00029	0.9957	-0.08174	0.3286	-0.05984	0.5498	-0.08406	0.3347
Ret_Vol	55.86804	0.279	150.5251	0.1054	143.31845	0.1118	75.05082	0.3626

Table 22: Which firms are more sensitive to peers' voluntary disclosure strategy? – Continued

Inst_Owner	11.8276	0.324	-6.70515	0.7401	12.31107	0.5281	5.97659	0.7549
NO_Analyst	-1.25327	<.0001	-1.22553	0.0026	-1.23202	0.009	-1.04973	0.018
MEF_Cost	11.4876	0.0075	16.88952	0.1403	13.38213	0.2201	8.29861	0.3996
SEO	62.80978	0.0002	63.27899	0.0155	80.63841	0.0016	59.37858	0.012
SIZE	13.10044	<.0001	13.88481	0.0003	8.61333	0.1267	12.53237	<.0001
ROA	41.96157	0.1178	49.03527	0.1003	47.55311	0.2063	3.37387	0.931
BTM	-15.69199	0.0163	-17.04479	0.0547	-26.93468	0.0098	-0.24112	0.9837
ΔEPS	1.50355	0.2614	1.36558	0.4079	0.89446	0.6642	4.21381	0.0814
First Stage Multivariate F-Stat				36.87***				
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	2,528		1,264		1,231		1,104	
Adjusted R-square	0.246		0.2392		0.2508		0.2294	

Panel C: which firms are more sensitive to mimic the peers' bad news

	2SLS Regression: Dependent = BadNews							
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Intercept	-0.030823	0.6616	0.047698	0.6995	-0.164546	0.0826	-0.04507	0.6907
Peer_BadNews	0.002448	0.0824	0.079957	0.0007	0.0136188	0.2117	0.04218	0.0507
Peer_BadNews*Rating_Firm	0.014049	0.0915						
Rating_Firm	-0.034717	0.2088						
Peer_BadNews*Profit_Firm			-0.079977	0.0006				
Profit_Firm			-0.074489	0.0934				
Peer_BadNews*Large_Firm					-0.004675	0.7515		
Large_Firm					0.0180171	0.7078		
Peer_BadNews*MTB_Firm							-0.04499	0.0301
MTB_Firm							0.034395	0.4655
ERC	5.69E-05	0.7175	0.000123	0.6067	-7.34E-05	0.7675	0.000163	0.447
Ret_Vol	-0.560208	0.0004	-0.525963	0.0396	-0.191231	0.4083	-0.38934	0.1587
Inst_Owner	0.049552	0.0951	0.02166	0.6525	0.0556559	0.2778	0.014172	0.7585
NO_Analyst	-0.001259	0.1091	-0.00164	0.1354	-0.001693	0.1488	7.78E-05	0.9448
Growth	0.038881	0.0768	0.037243	0.2142	0.0656702	0.0129	0.067496	0.0391
Litigation	-0.000828	0.9458	0.016381	0.4179	-0.002001	0.9187	0.026161	0.157
Durable	0.014509	0.1952	0.045254	0.0122	0.0339988	0.0742	0.033298	0.0717
SEO	-0.01718	0.5233	-0.024491	0.4215	-0.014997	0.6711	-0.02813	0.4058
SIZE	0.019547	0.0002	0.016322	0.0662	0.0222509	0.0433	0.012324	0.1323
Loss	-0.16422	<.0001	-0.273517	0.0004	-0.161058	0.001	-0.20953	<.0001
Leverage	0.091942	0.012	0.132317	0.0232	0.0930045	0.1401	0.161932	0.0021
ROA	-0.142464	0.1848	-0.299554	0.0178	-0.147272	0.3056	-0.1662	0.2815
BTM	-0.099223	<.0001	-0.074581	0.0093	-0.142	<.0001	-0.03244	0.4365
ΔEPS	0.008224	0.05	0.006521	0.211	0.0151059	0.0184	0.011142	0.0994
First Stage Multivariate F-Stat				4.1**				
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes	
Observations	3,020		1,537		1,459		1,337	
Adjusted R-square	0.1424		0.226		0.172		0.1948	

This table illustrates which types of firms are more sensitive to the industry peer firms' voluntary disclosure. In the Panel A, B and C, I respectively examine which types of firms are more sensitive to the industry peer firms' disclosure frequency, disclosure horizon and disclosure of bad news. For each column of the regressions, the type of firms is respectively determined by whether it's S&P credit rated, whether it has high profits, whether it has larger size, and whether it has higher market-to-book ratio.

In the Panel B, I test whether certain types of firms are more sensitive to their industry peers' disclosure horizon. Unfortunately, I don't find any significant interaction terms between peer firms' disclosure horizon and group identifications (rating, profitability, size, and MTB ratio). This suggests there are not certain types of firms that are more sensitive to their industry peers' disclosure horizon. Finally, in the Panel C, I test which firms are more sensitive to their peers' disclosure level of bad news. I find a significantly negative coefficient for the interaction term between peer firms' bad news and whether the firm is profitable (coefficient=-0.0780, P-value=0.0006) and the interaction term between peer firms' bad news and whether the firm has the high MTB ratio (coefficient=-0.0450, P-value=0.0301). This suggests that firms with higher profitability and higher MTB ratio tend to be less sensitive to the bad news disclosed by their industry peer firms. I also find that the interaction term between peer firms' bad news and whether it's a rating firm (coefficient=-0.0347, P-value=0.0915) and thus I find the weak evidence that rating firms tend to be less sensitive to bad news disclosed by their peers.

7.2 Leader-Follower relation

As mentioned above, certain types of firms are more sensitive to their peers' disclosure behaviors. Hence this section tends to investigate the existence of leader-follower relation in the mimicking peers' disclosure strategies. In other words, if certain firms (followers) will always mimic the leaders' disclosure strategy and leaders don't mimic the followers' disclosure strategy, the leader-follower relation exists and thus the herding theory and free ride theory can explain this peer effects on disclosure strategy. However, if the evidence of leader-follower relation is weak, this suggests that all the

firms actively respond to their peers' disclosure strategy and thus herding theory and free ride theory will not be the major explanations for the peer effects on disclosure strategy. In this section, I classify the leader and follower based on firm size and profitability. If the firm's profit or size is within the top 25 percentile, the firm is classified as the leader. Otherwise, the firm is classified as the follower.

The Table 23 provides the main results of 2SLS regressions under the reduced form[16]. In the first three columns, the leaders and followers are classified based on the firm profitability and in the last three columns the leaders and followers are classified based on the firm size. In the Panel A, under both classification methods I find that the changes in leaders' disclosure frequency, disclosure horizon and disclosure of bad news will significantly influence the specific firm's disclosure strategy. In the Panel B, under both classification methods, I find that the changes in followers' disclosure strategy will significantly influence the specific firm's disclosure strategy. This suggests that not only industry leaders will influence the industry followers' disclosure strategy but also the followers will influence leaders' disclosure strategy. This suggests the herding theory is not a major reason in explaining the peer effects on disclosure strategy. Moreover, free rider theory is also not a major reason in explaining the peer effects, because the voluntary disclosure is pricy and industry leaders also mimic the followers' disclosure strategy. In contrast, I believe the signaling theory, litigation risk and manager reputation are the major reason in explaining that every firm actively respond to its peers' disclosure strategy.

[8] I omit the coefficients and t-statistics of control variables and intercept in the Table 8 to make the table look more concise.

Table 23: The leader-follower relationship in the peer firms' effect on MEF - Reduced Form

Panel A: Do followers respond to the leaders' MEF behaviors?

	Profitability						Firm Size					
	Depedent =ΔFreq		Depedent = ΔHorizon		Dependent=ΔBadNews		Depedent =ΔFreq		Depedent = ΔHorizon		Dependent=ΔBadNews	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
ΔLeader_Freq	0.413106	<.0001					0.56683	<.0001				
ΔLeader_Horizon			0.282245	<.0001					0.24904	0.0015		
ΔLeader_BadNews					0.2731844	0.0225					0.33079	0.0183
Firm Specific Factors	Yes		Yes		Yes		Yes		Yes		Yes	
First Stage Multivariate F-Stat	20.18***		16.2***		4.35**		32.84***		45.15**		5.42**	
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	4,948		1,305		1,632		5,041		1,437		1,771	
Adjusted R-square	0.08928		0.07276		0.1501		0.08859		0.06019		0.1478	

Panel B: Do leaders respond to the followers' MEF behaviors?

	Profitability						Firm Size					
	Depedent =ΔFreq		Depedent = ΔHorizon		Dependent=ΔBadNews		Depedent =ΔFreq		Depedent = ΔHorizon		Dependent=ΔBadNews	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
ΔFollower_Freq	1.387553	0.0031					1.25137	0.0113				
ΔFollower_Horizon			0.40101	0.0058					0.539303	<.0001		
ΔFollower_BadNews					0.6594722	<.0001					0.235033	0.0498
Firm Specific Factors	Yes		Yes		Yes		Yes		Yes		Yes	
First Stage Multivariate F-Stat	8.58***		15.84***		5.49**		4.16**		8.27***		4.01**	
Industry Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year Fixed Effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	6,246		1,731		2,119		6,197		1,697		2,077	
Adjusted R-square	0.08776		0.04804		0.1445		0.08793		0.05759		0.1381	

This Table illustrates whether certain leader-follower relationship exists in the effect of industry peer firms on the specific firm's voluntary disclosure. The control variables are ommitted in this table. In the Panel A, the dependent variables are the followers' changes in the disclosure frequency, disclosure horizon and disclosure of bad news. And the independent variables are the leaders' changes in the disclosure frequency, disclosure horizon and disclosure of bad news. In the Panel B, the dependent variables are the leaders' changes in the disclosure frequency, disclosure horizon and disclosure of bad news. And the independent variables are the followers' changes in the disclosure frequency, disclosure horizon and disclosure of bad news. The leaders and followers are respectively defined based on the profitability and firm size in the first three columns of regressions and in the last three columns of regresssions.

8. Conclusions

This paper introduces how industry peer firms' voluntary disclosure strategy will influence the specific firm's voluntary disclosure strategy. After reviewing prior literature, I conjecture that firm tends to mimic industry peers' disclosure strategy based on signaling theory, herding theory, free rider theory, litigation risk and CEO reputation. Leary and Robert (2014) suggest the existence of endogeneity problem if researchers directly use the industry average values to test the peer effects. Therefore, I implement the 2SLS regression method and construct instruments, including the peer firms' earnings non-synchronicity and peer firms' ERC, respectively to test the peer effects on management earnings forecast and management earnings expectation. The results suggest that industry peer firms' disclosure frequency, disclosure horizon and disclosure level of bad news will significantly influence the specific firm's disclosure frequency, disclosure horizon, and disclosure level of bad news. Specifically, I find that the increase in the industry peer firms' disclosure frequency, disclosure horizon and disclosure of bad news will encourage the specific firm to increase its disclosure frequency, disclosure horizon and disclosure of bad news. In contrast, I don't find a significant correlation between industry peer firms' good news disclosure and the specific firm's good news disclosure. Moreover, I find that firms with S&P credit rating, higher profit, larger size and higher MTB ratio are more sensitive to industry peers' disclosure frequency and firms with higher profit and higher MTB ratio are less sensitive to industry peers' disclosure of bad news. Finally, I test whether the phenomenon of mimicking peers' disclosure strategy is based on the leader-follower relation. However, through empirical results I don't find a leader-follower relationship existed in the peer effects of disclosure strategy. In contrast, I

find that each firm respond actively to its industry peers no matter its position within the industry. This suggests the herding theory and free rider theory are not major reason in explaining the peer effects of disclosure strategy. And due to signaling theory, litigation risk and CEO reputation, the specific firm tends to mimic their peer firms' voluntary disclosure strategy.

This paper contributes to accounting literature by providing new evidence for the managerial incentive behind of the voluntary disclosure. The results suggest that not only internal factors but also factors outside the firm will also influence the managers' voluntary disclosure strategy. Through examining the effects of industry peer firms on the specific firm's voluntary disclosure strategy, we can better understand our accounting information system. Moreover, this paper provides theory support for the peer effects phenomenon. The empirical results suggest that signaling theory, litigation risk and CEO reputation are better than herding theory and free rider theory in explaining why firm tends to mimic its peers' disclosure strategy, and thus this enrich the framework of voluntary disclosure research. Thirdly, through implementing the 2SLS regression and constructing the appropriate instruments, this paper solves the endogeneity problem which exists in most prior research of voluntary disclosure. By improving the research design, this paper not only suggests the causal effect conclusion but also provides some shed light on future voluntary disclosure research. Finally, this paper tries to mimic the interactive accounting information system in the real business world and tends to investigate how each single firm actively respond to its competitors in the market. Future research can further examine this interactions among different firms and improve the methodology by developing a multi-period model to mimic the vivid real business world.

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Appendix: Variable Definition

Disclosure = a dummy variable which is equal to 1, if the firm releases a sustainability report in the sample year and the report has been recorded in GRI database; zero otherwise.

DIS_Q1 = a dummy variable which is equal to 1, if the firm prepare the sustainability report based on any of the GRI frameworks; zero otherwise.

DIS_Q2 = the application level of GRI framework in preparing the sustainability report

EQ = the earnings quality measured as the standard deviation of the residuals obtained from the modified Dechow and Dichev model during the 5-year period prior to the sample year. The variable is multiplied by -1 except in the regression of Equation 2.

IEQ = the predicted value from the regression of earnings quality on inherent firm traits. The variable is multiplied by -1 except in the regression of Equation 2.

DEQ = the residual from the regression of earnings quality on inherent firm traits. The variable is multiplied by -1 except in the regression of Equation 2.

CFVOL = the standard deviation of cash flows scaled by total assets over the previous five year window

SALEVOL = the standard deviation of sales scaled by total assets over the previous five year window

OPCYCLE = the natural logarithm of operating cycle

NEG = the frequency of negative earnings realizations during the previous five years

INT = intangible (the sum of R&D expenditures and advertisement expenditures) scaled by total assets

INTDUM = a dummy variable which is equal to 1, if research and development expenditure or advertising expenditure is the missing value; zero otherwise.

CAP = capital expenditures scaled by total assets

BIG8 = a dummy variable which is equal to 1 if the firm is audited by the BIG 8 auditor; zero otherwise

NOA =a dummy variable which is equal to 1 if firm net operating assets at the beginning year scaled by beginning sales are above the median of corresponding industry's net operating assets; zero otherwise.

Cycle = the firm operating cycle measured by the accounts receivable cycle plus inventory cycle and minus the accounts payable cycle

SIZE = natural logarithm of firm total assets

BTM = book-to-market ratio

ROA = return on assets

Current = current assets to total assets ratio

Leverage = total liabilities to total assets ratio

Audit_Fee = the natural logarithm of total audit fees in the sample year

ACCR = the total accruals scaled by total assets

Segment = the number of business segments

Report_Lag = the time lag between earnings announcement date and financial statement date

Loss = a dummy variable which is equal to 1 if the firm experiences the negative income during the sample year; zero otherwise.

DEC = a dummy variable which is equal to 1 if the firm has a December fiscal year; zero otherwise

ISSUE = the dummy variable which is equal to 1 if the sample firm issues at least one quarterly MEF during the sample year, and zero otherwise

Freq = the number of quarterly earnings forecasts released by the sample firm in the sample year

News = the difference between the management earnings forecast and the median of financial analyst forecast for the same forecast period, scaled by the absolute value of median of financial analyst earnings forecast

Good_News = Max (News, 0)

Bad_News = Min (News, 0)

ABJ_Sticky = the cost stickiness measured by ABJ 2003 model

Cost_Sticky = the cost stickiness measured by Weiss 2010 model, and the cost is measured by difference between sales revenues and income before extraordinary items

COGS_Sticky = the cost stickiness measured by Weiss 2010 model, and the cost is measured by cost of goods sold

SGA_Sticky = the cost stickiness measured by Weiss 2010 model, and the cost is measured by the selling, general and administrative expenses

Inst_Owner = the percentage of firm's shares owned by the institutional investors at the period end

Ret_Vol = the standard deviation of monthly raw return over the 36 months prior to the sample period

MEF_Cost = the voluntary disclosure cost, measured by the industry level weighted average entry costs to proxy firms' competency to face the threat of new entrants. The value is multiplied by -1

Earn_Predict = the logarithm transformation of R-square from regressing return-on-assets for the period t on return-on-assets for period t-4 over a rolling window of 16 quarters prior to period t

ERC = regressing three-day cumulative market adjusted stock returns on unexpected earnings over 36 months prior to the period t.

Peer_ERC = the mean of peer firms' ERC excluding the specific firm i

Nonsynch = the earnings non-synchronicity by pair-wise regressing the specific firm i's return-on-asset (ROA) on its peers firms' (within the same two-digit SIC code, excluding firm i) ROA over the 16 quarters prior to quarter t, following Gong et al. (2013)

Peer_Nonsynch = the mean of peer firms' earnings non-synchronicity excluding the specific firm i

SEO = a dummy variable which is equal to 1 if the firm issues new equity in the period t+1 and zero otherwise

Growth = the difference between present total assets and previous year total assets scaled by previous year total assets

Litigation = the dummy variable which is equal to 1 if the firm is in the high-risk industry (SICs 2833-2836, 3570-3577, 7370-7374, 3600-3674 and 5200-5961), zero otherwise.

Durable = the dummy variable which is equal to 1 of the firm is in the durable goods industry (SICs 150-179, 245, 250-259, 283,301, 324-399), and zero otherwise.

Labor_Intense = 1 minus the ratio of PPE to gross assets

No_Analyst = the number of financial analysts following the sample firm

ΔEPS = the changes in earnings from the previous year

ISSUE_SH = the dummy variable which is equal to 1 if the firm issues at least one short-horizon MEF which is released within 90 days prior to the forecast period, zero otherwise.

ISSUE_LH = the dummy variable which is equal to 1 if the firm issues at least one long-horizon MEF which is released more than 90 days prior to the forecast period, zero otherwise.

Freq_SH = the frequency of short-horizon MEF issued which is released within 90 days prior to the forecast period

ISSUE_LH = the frequency of long-horizon MEF issued which is released more than 90 days prior to the forecast period

Firm_Efficiency = data from Demerjian, Lev and McVay library.

Horizon = one plus the natural log of the difference between fiscal end date and the forecast date

Rating_Firm = the dummy variable which is equal to 1 if the firm has the S&P credit rating, zero otherwise.

Profit_Firm = the dummy variable which is equal to 1 if the firm's profitability is within the top 25 percentile within each industry and is equal to 0 if the firm's profitability is within the bottom 25 percentile within each industry

Large_Firm = the dummy variable which is equal to 1 if the firm's size is within the top 25 percentile within each industry and is equal to 0 if the firm's size is within the bottom 25 percentile within each industry

MTB_Firm = the dummy variable which is equal to 1 if the firm's market-to-book ratio is within the top 25 percentile within each industry and is equal to 0 if the firm's market-to-book ratio is within the bottom 25 percentile within each industry