

The Impact of SEC Regulation Fair Disclosure of Insider Trade  **on**

Information Asymmetry



in US Capital Market



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Abstract

This thesis examined the impact of the U.S. Securities and Exchange Commission (SEC) Regulation Fair Disclosure (RFD) of insider trading on information asymmetry in the US capital market. The issue of information asymmetry among investors is still an ongoing debate in the capital market. Insiders of public companies have access of private information and therefore they are misleading investors to invest in their companies by providing biased information.

Data of US listed companies over the period September 1999 till December 2001 is used to test whether the adoption of SEC regulation fair disclosure decreases information asymmetry in the US capital market. As in prior researches bid ask spread is used as proxy for information asymmetry. Prior researchers claimed the regulation fair disclosure decreases information asymmetry among investors, increases disclosure frequency and decreases the quality of information. The results of the study indicate that SEC regulation fair disclosure decreases the information asymmetry and that there is a negative correlation between bid ask spread and SEC RFD which is consistent with the results of prior researches.

Keywords: Information Asymmetry, Insider Trading Securities Exchange Commission (SEC), Regulation Fair Disclosure (RFD).

Preface

This thesis is performed in the fulfillment to get the master degree in Accounting, Auditing and Control, at the Erasmus University, school of Economics in the Netherlands. My attention in this subject was triggered during the seminar Financial Accounting Research course, in which the subject insider trading, disclosure and information asymmetry was taught. This study was a big challenge for me as well as completing this thesis. But still I take this opportunity to thank my lecturer who helped me with finding a research topic during the above mentioned seminar.

I am grateful that I studied Accounting, Auditing and Control at the Erasmus University and that this course is of great interest for my job and future carrier. In this matter, I bring a vote of thanks firstly, to the Lord for given me strength during the whole study years, for standing by me during the difficult and educational moments and for always being there for me when I lost hope. Secondly, I would like to thank my family who was always there for me when I needed them the most. My special thanks to my boyfriend for his advice, motivational talks and for monitoring my planning during this master thesis. Finally, I want to thank my research ex supervisor Mr. R. Achaibersing, co-reader Dr. K. Maas and supervisor Drs.Ted Welten who both played a key role in guiding and advising throughout writing this thesis.

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1. Introduction

1.1: Background

Researchers and academics have been studying the issue of insider trading and information asymmetry over the past 30 years but still there are inconsistent answers about this issue. Insider trading is the legal buying and selling of shares by corporate insiders within the same company. Corporate insiders are defined by U.S. Securities and Exchange Commission, hereafter (SEC) as officers, directors and large shareholders who buy and sell their own shares. According to Kallunki et al. (2008) corporate insiders buy and sell trade with the intention to exploit private information such as re-balancing objectives, tax considerations and behavioral bias. These inside traders in public companies are bound by rules and regulation of the U.S. Securities Exchange Act 1934 and Securities and Exchange Commission.

Information asymmetry is when corporate insiders to business transactions have an information advantage over outsiders. This means that external investors have insufficient information to evaluate firm current and future performance or prospects (Scott, 2014). Information has been a general problem between insiders and outsiders in capital market, because insiders have access to private information of the company. To solve or mitigate this information asymmetry problem U.S. Securities Exchange Act 1934 implemented Securities and Exchange Commission (SEC). The goal of this act (rule) is to reduce unfair information asymmetry caused by selective disclosure and to make sure that all investors will be provided with reliable information by companies. SEC is a U.S. government agency that monitors securities transactions and activities of financial professional and mutual trading to prevent fraud and intentional deception. The issue of information asymmetry among insiders and external investors became more interested because technologies and globalization have make capital market accessible for all investors. Due to this change and development in the capital market companies try to mislead investors by providing and disclose bias information about their business with the intention to attract investors to invest in their companies. In October 2000, SEC has implemented Regulation Fair Disclosure (RFD) with the purpose to promote full and fair disclosure of information by issuers, to clarify and enhance existing probations against insider trading and the fairness to the capital market.

1.2: Research question

The implementation of RFD has instigated debate over the impact in the capital market and still this debate is ongoing. After the implementation there was disagreement because with this new rule a wider group of investors has more power to get access to market moving information. The wider accessibility of investors to private information of companies can lead to the decline of the quality and the quantity of information. Due to these changes in regulation companies have to disclose information more frequently. The question remains if this information is unbiased. Corporate insider will provide inside information that is attractive for investors to attract them to invest in their companies. Management board of companies will manipulate with financial data, distortion of information and bribing of auditors to mislead investors.

Several studies have been done about the impact of Regulation Fair Disclosure on topics as information asymmetry and trading, RFD and cost of adverse selection, regulation and information asymmetry, insider trading regulation and private information trading, disclosure regulation and profitability of insider trading. Many researchers have found that RFD improves liquidity, decreases the level of information asymmetry and increases retail trading activities around the earnings announcement period (Chiraphol et al. 2004; Etbari et al. 2004; Durnev et al. 2007; Sibhu et al. 2008; McLaughlin et al. 2008). Li et al. (2011) examine whether investors feel fairer after the implementation of RFD. The result of this study indicated that RFD decreases information asymmetry during earnings announcements. Prior research of McLaughlin et al. (2008) investigated the role of regulation in reducing information asymmetry between insiders and outside investors by making a distinction between industrial and regulated utility. They reported that regulation leads to a lower level of information asymmetry and superior change in abnormal operating performance by utility then industrial firms. Another empirical research done by Durnev et al. (2007) about how insider trading regulation deter private information trading in an international context documented some facts. First of all, this study indicated that when countries implemented stricter rules of insider trading, they must also ensure investor protection standards that will cover up manipulation of financial statements by companies. Besides, the result also shows a decline in the amount of private information trading in countries with stricter insider trading regulation and that companies with high agency have opaque earnings and are valued lower. Frijns B et al. (2008) documented that the implementation of new legislation of

insider trading has resulted in a decrease of spread, information asymmetry on the cost of capital and stock price volatility. Heflin et al. (2003) investigated the association between RFD and financial information environment. They reported that return volatility has been lower and the quantity of firm voluntary disclosure increases after the implementation of RFD. However, Van Buskirk (2012) established that providing frequently disclosures will not reduce information asymmetry, but greater quantity of disclosure will reduced information asymmetry, while, Sibhu et al. (2007) highlights an increase in the expected cost of information asymmetry after the RFD. Gow et al. (2011) indicated that more precise disclosure can lead to an increase in information asymmetry. This study is closely related to the study of Sunder (2002) which investigated the impact of Regulation Fair Disclosure on information asymmetry. He found higher bid asks spread by firms who selectively disclose information and a contribution of RFD to leveling the information asymmetry among investors.

There is still a contradictory result about the issue of insider trading regulation and information asymmetry in the capital market. Researchers have been done a lot of study in different countries about the impact of RFD in different countries around the world. But there were limited researches about the impact of RFD on information asymmetry among insiders and investors in the U.S. capital market. Based on above mentioned, the following research question is formulated.

Does SEC Regulation Fair disclosure of Insider trading decrease the information asymmetry among Investors in US capital market?

To provide a thorough understanding of the importance of above mentioned theory and to answer the main research question, the following sub questions will be answered:

1. What is the background information and role of SEC?
2. What are the requirements of RFD?
3. Why is disclosure important and what are the different types of disclosures?
4. Which accounting theories explain information asymmetry?

5. What is the relation between information asymmetry, Regulation Fair Disclosure and insider trading?
6. What are the findings of prior empirical studies regarding this topic?
7. What are the developed hypothesis and the research design of this research?
8. What is the result of this research?
9. What is the interpretation and analysis of the results of this research?
10. What is the conclusion of this research?

1.3: Research methodology

Prior researches have been done about the impact of Regulation on information asymmetry, but there were inconsistent results about this issue. According to Diamond (1985); Bushman (1991) and Lundholm (1991), frequently reporting of financial information decreases information asymmetry. Chiyachantana (2004); Eleswarapu (2004); Frijns B et al. (2008) documented a decrease in information asymmetry after the implementation of RFD. Frankel et al. (2004) Gu F. et al. (2012) concluded that timely disclosure of relevant information reduce information asymmetry. Eleswarapu et al. 2004 found an unchanged flow of information after the implementation of RFD. Gow et al. (2011) indicated an increase in information asymmetry. This study investigates whether SEC RFD of insider trade leads to a decreasing of information asymmetry among investors in U.S. capital market. Firstly, prior researches will be examined and from the theory and results of these studies the hypothesis of this study will be derived. The quantitative method is used in this study to do the investigation. Quantitative method is chosen because financial data will be collected and evaluate to test the developed hypothesis in this study. Next, a difference in difference test is used to test whether there is a decreasing of information asymmetry after the implementation of SEC RFD. Information asymmetry is the dependent variable and will be measured using bid ask spread. Bid ask spread is the absolute differences between the quoted bid and ask price. Form 4 filings are used to measure the independent variable, which is the SEC RFD. Furthermore, related control variables are used to help test the hypothesis. A regression model which is used in this study is from prior studies. The

sample period of this thesis consist of U.S. listed companies from September 1999 till December 2001. According to the result provided in chapter seven the expectation is confirmed among U.S. firms. The study provides that before the introduction of the SEC RFD filing information asymmetry was high, but after the adoption information asymmetry decreased among investors in the U.S. capital market.

1.4: Motivation

U.S. listed companies are chosen because compared to other countries U.S. has stricter rules about financial accounting. Base on the fact that SEC is a U.S. government agency which main goal is to prevent fraud and intentional deception, and secondly because of the ongoing debate about information asymmetry between inside and outside investors, is it worthy to investigate whether the implementation of SEC RFD has changed the capital market environments after the implementation of RFD. Furthermore, to examine whether the implementation has leads to a transparent capital market.

1.5: Relevance

It is important to answer this question, because the problem of lack of information and agency conflicts between investors and firms can disturb the relation of trust. Moreover, due to the different financial scandals such as the Enron, WorldCom, Ahold,etc. investors start losing trust in public firms. To build up good trust and relation between investors and firms, the firms must be able to provide the investors with relevant useful and sufficient information.

This study makes several contributions to this subject. First of all, the results provide valuable insight for investors; standards setter, regulators and also public companies that deals in insider trade. Secondly, it contributes to the existing debate and literature about insider trading and information asymmetry. The third reason is that the findings can help develop new strategies and perspectives to shed more light on the ongoing debate in the capital market. Finally, it can be the first study to increase academic and researcher attention for the impact of the new regulation in the U.S. capital market and seek their interests.

1.6: Limitations

This study is focused to find the impact, consequences, advantage, disadvantages which the implementation of SEC RFD can have in the U.S. capital market. The study only focuses on the U.S. capital market which means that the result of this cannot be generalized to other countries. The other limitation is that only firms which reported to SEC and using Form 4 are selected in the sample for the study.

1.7: Structure

The remainder of the thesis is organized as follows. Chapter 2 discusses the theoretical part of SEC, requirements of SEC disclosure rules, the advantages and disadvantages of the introduction of SEC Regulation Fair Disclosure, the importance, advantages and disadvantages and different disclosure types. The second chapter answers the sub question 1 till 3. Hereafter chapter 3 will give an overview of the different and relevance accounting theories that is explaining information asymmetry, the importance of it, which theory is relevant for information asymmetry and possible solution of the information asymmetry problem. The 4 sub question will be answered in this chapter. The different empirical and related researches will be discussed in chapter 4. This chapter provides the answer to sub question 5. Furthermore the relation between insider trading, Regulation Fair Disclosure and information asymmetry will also be described in this section. Chapter 5 will discuss the hypothesis which has been developed to do the study. Subsequently, the methodology of the study will be discussed in chapter 6, the regression model which will be use, definitions of the independent, dependent and control variables and how the data of the study will be collected. Furthermore, chapter 7 will interpret and analyze the findings of this study. And finally Chapter 8 provides the conclusion of the study.

The next chapter provides the background information of SEC and the Regulation Fair Disclosure.

Chapter 2: Background information of SEC and Regulation Fair Disclosure

2.1: Introduction

This chapter will present a brief description of the existence and role of SEC, the implementation and requirements of RFD. Furthermore, the importance of disclosure of information and the different types of disclosure are discussed. This chapter also provides the answers to the first, second and third sub questions.

2.1.2: The role of Securities and Exchange Commission (SEC)

All over the world there are regulations of corporate reporting and disclosure. In the U.S. all listed companies are required to report and file according to the disclosure rules of SEC. Countries have started to tighten their disclosure rules because of the different financial scandals such as the Enron, Ahold and WorldCom case that occurred in the past years. Due to the different financial scandal investors started losing trust in public companies they invested in. To protect the investors from misleading by management of public companies, Securities Exchange Act implemented Securities and Exchange Commission (SEC). The purpose of SEC is to protect investors, maintain fair, orderly and efficient markets and to facilitate capital investors. Furthermore, to make sure that investors are threaten fairly and honestly by public companies who sell and trade securities and that public companies tell the truth about their business to investors. For example telling them about the securities they are selling and the risk of investing in those securities.¹ Although, financial accounting standards and regulation public companies still provide investors with bias, unreliable, unfair information and which cause information asymmetry among investors and insiders. Public companies are provided bias information for personal gain. Therefore, SEC was looking for solution to prevent all this fraudulent practices to protect the investors to be misleading by public companies management. In the 90's SEC propose new rule about fair disclosure of information for public companies. The next section will give a brief description of this rule.

¹<https://www.investor.gov/introduction-markets/role-sec>

2.1.3: Background Regulation Fair Disclosure (RFD)

SEC proposed on December 20, 1999 a new rule for disclosure of information to the general public. This new rule is called Regulation Fair Disclosure, hereafter RFD. The goal of RFD is to prohibit selective disclosure of material nonpublic information to selected securities analysts, institutional investors, shareholders which are provided and issued by company management before making full disclosure of the same information to the general public². RFD is adopted because selective disclosure may cause conflicts of interests for investors, reduces investors' confidence in the fairness and integrity of the markets, creates information asymmetry between insiders and investors, managers are using information to bribe analyst and to remove selective disclosure of private information Sibhu et al. (2000)³. Due to the ongoing debate of information asymmetry between insiders and investors, SEC approved on August 15, 2000 RFD, which became effective on October 23, 2000. The purpose of RFD is to promote full and fair disclosure of information by issuers and to clarify and enhance fairness in the capital market against insider trading⁴. Another goal is to improve the information flow between insiders and capital markets due the changes in technology. Further to fight equal access to company's material disclosure at the same time for investors and combat selective disclosure of material nonpublic information to selected group. In the next paragraph the requirements of RFD will be discussed.

2.1.4: Regulation Fair Disclosure requirements

SEC implemented RFD to prohibit selective disclosure of material nonpublic information. To make this regulation effective SEC prescribes requirements on which every public company should comply. RFD is requiring public companies which disclose material nonpublic information to a selective group to disclose that same information to the public at the same time. The timing depends on whether the disclosure was intentional or unintentional. It also requires that the company should simultaneously make public disclosure whether the selective disclosure was intentional. But if the selective disclosure was unintentional, than it should be rectified

² <https://www.sec.gov/news/extra/seldsfct.htm>

³ <https://www.sec.gov/news/extra/seldsfct.htm>

⁴ www.sec.gov

promptly afterwards. Furthermore, companies should use Form 8-K to make the public disclosure. And they must use disclosure channels such as company websites, press release, telephone calls, and press conference to make public disclosure.⁵ The next section mentions some benefits of RFD.

2.1.5: Advantage of Regulation Fair Disclosure

The Implementation of RFD has as well advantages and disadvantages for investors and securities markets in different ways. First of all the implementation of RFD will lead to fairer disclosure of information to all investors. Secondly, it will enhance investor's confidence in the capital markets to enhance market efficiency and liquidity and encourage widespread investor's participation in the capital market and effective capital funding. Thirdly, it will provide benefits to those seeking unbiased analysis. Finally, RFD will give analyst equal access to material information which will allow them to express their opinion about fear and being denied access to valuable corporate information⁶. The next paragraph will explain the importance, different types, advantages and disadvantages of disclosure.

2.2: Disclosure

2.2.1: The importance of disclosure

The question why public companies should disclose frequently, timely, relevant and reliable information is still of great interest. Managers of public companies have the leading position in the companies and are responsible for providing valuable and new information about the firms to shareholders or investors. Therefore managers provide firms' financial information, operation situations, manager incentives and discretion to investors Yifang Wan (2009). Disclosure is the communication of economic relevant financial and non financial information from public companies to outside investors concerning the company financial position and performance. In other words, disclosure refers to releases of information that are in nature economic or non-economic. This information is mostly released by companies in their annual reports. There are several ways to disclose companies' financial and non financial information to the capital

⁵<http://www.sec.gov/rules/final/33-7881.htm>.

⁶www.sev.gov

markets it can be mandatory or voluntary. For instance, mandatory though firms financial statements (quarterly or annual reports), voluntary by press releases, conference call etc. and selective disclosure to communicate to investors. Investors will evaluate the provided information to get a better understanding or indication of the firm current and future performance. There is an increasing demand for more disclosure over the last years. Healy and Palepu (2001) documented that shareholders require more and more disclose mainly because of the increasing information asymmetry between the management and the shareholders. It is well documented that management has an advantage to the shareholders regarding the financial situation of the company. That is mainly because of internal information that is available to them. As a consequence, the shareholders are not in a solid position, in which they could determine and judge the value of their decisions, according to the annual reports only. Disclosure is important because investors make investment decision based on the provided information about; firm's performance and future prospects. Frequently disclosure of inside information to investors will decrease information asymmetry between the firm and it shareholders or buyers and sellers of firm share. The disclosure of information was before the implementation of SEC RFD not frequently enough. Only selective group were provide with the information. Because of this differences in disclosure and information flow SEC sought to remove the selective by implementing SEC RFD so that investors also get all relevant information flowing in the firms to the capital market and to decrease the information asymmetry among investors in the capital market.

2.2.2: Different types and advantages of disclosure

Mandatory disclosure

Disclosure can be divided in voluntarily and mandatory disclosure. Mandatory disclosures are disclosures which are mandated by regulation or disclosure in order to comply with laws and regulation requirements Shetana et al. (2014). Popa et al. (2008, p.1408) defines mandatory disclosure as *“those aspects and information which must be published as a consequence of the existence of some legal or statutory stipulations, capital markets, stock exchanges commissions or accounting authorities regulations”*.

Voluntary disclosure

Voluntary disclosure is the process of voluntarily providing information from public firms to the financial capital markets, which are not mandated by regulation such as press releases (financial/non-financial), investor and analyst meetings, Conference calls, Monthly newsletters, field visits with existing and potential institutional investors and disclosures beyond mandated in regulatory filings. Several researchers have been defined voluntary disclosure as “*a discretionary release of financial and non-financial information through annual reports over and above the requirements of the mandatory disclosures*” Barako et al. (2006, p.114.);“*provision of information beyond the amount required by law and regulation*” Armitage et al. (2008, p. 315); “*the reporting outside the financial statements, which is not explicitly ruled through norms or laws*” Popa et al.(2008) and Meek et al. (1995), define voluntary disclosure as free choice of company managements to provide accounting and other information which is relevant to the decision need of the investors. Firms provide voluntarily information to investors to reduce information asymmetry, undervaluation of stock, information risk and cost of capital and to fool investors for private benefits and increase liquidity and analyst coverage. The objective to disclose insider trading information is according Huddart et al. (2001) to reduce information asymmetry between corporate insiders and outside investors. Healy et al. 2001; Kumar et al. (2007) concluded that the goal of voluntary disclosure is to provide investors a view of business the long term sustainability, reducing information asymmetry and agency conflicts between managers and investors.

Advantages of voluntary disclosure

Most public firms voluntarily disclose information with the intention to attract investors to invest in their companies. Voluntary providing investors with useful information will lead to increase decision making by investors. Voluntary disclosure is beneficial for public firms because it increases management credibility, trading volume, share prices, long term investors and liquidity. It also increases the access to capital and decreases the cost of capital. Due to voluntary disclosure the number of analysts following of the firm will increase. Furthermore, it improves the relation with the investment community, institutional ownership, decreases bid ask spread, volatility and information asymmetry. The next paragraph describes the impact of RFD.

2.3: U.S. Insider trading Regulation

U.S. government adopted in the late 1909 common Law and SEC rules to prevent insider trading fraud. Insider trading has an illegal as well legal conduct. Illegal insider trading is the buying or selling of securities, in breach of fiduciary duty or other relationship of trust and confidence, while in possession of material, non-material information about the securities. According to SEC is *“information material when there is a substantial likelihood that reasonable investors would consider the information would have been viewed by the reasonable investor as having significantly altered the total mix of available information”*. *“While information is non material when it would not be considered important to the reasonable investor, even if it important to insightful analyst”*⁷. Legal insider trading is when corporate insider, officers and employees buy and sell stock in their own companies. Corporate insiders who trade in public company are bound by rules and regulation of the Securities Exchange Act 1934 and Securities Exchange Commission. Securities Exchange Act defines corporate insiders as officers, directors and large shareholder who own 10 percent or more of the firm stock. These corporate insiders are required to periodically report on form 4 filing information of publicly trade securities within two business days of the trades to SEC. All U.S. listed companies are bound by rules of SEC and should reports according SEC regulation rules. SEC has required that all issuers with securities registration under section 12 of Securities Exchange Act of 1934 should report under section 15d of the Exchange Act. Due to the illegal conduct of insider trading ongoing debate and disagreement made it difficult to accept the rule of insider trading. The courts also disagree with the adoption of insider trading regulation. SEC places insider trading violations as its enforcement priorities because it subverts investor’s confidence in the sense of fairness and integrity of the securities markets. To solve some of the issue where the courts had disagreed SEC has adopted new rules such as 10b5-1 and 10b5-2. Rule 10b5-1 stated that person who trades on basis of material nonpublic information must be aware of the material nonpublic information when buying or selling trades. Rule 10b5-2 focus on the misappropriation theory of non-business relationship. This means that trustworthy person will owe a duty of trust which is liable under the misappropriation theory and therefore receive confidential information.

⁷www.sec.gov

2.4: Summary

Corporate insiders were disclosing information before the adoption of SEC Regulation Fair Disclosure to selective groups of analysts and investors. They were making use of different channels such as conference calls, meetings, phone conversation etc. The intention was to discuss with a selective group of shareholders the firms current and future performance. Furthermore, the meaning of this selective disclosure was also to gain information advantage over the investors and private benefits. With this position it was easy to mislead the investors to invest in their companies Therefore SEC Regulation Fair Disclosure is implemented to prevent selective disclosure of material information by insiders and professionals and to provide equal access to firm disclosure. If insiders have access to private information of the firm and outside investors don't, then this will lead to information asymmetry among both parties. Providing equal access will help decrease the information asymmetry in the capital market. SEC Regulation Fair Disclosure requirements insiders to use form 8-K to make public disclosure, report within 24 hours after discover of non-intentional disclosure, press release should only make through widely circulated news or wire service. The SEC is a U.S. government agency which strictly obliges U.S. companies to report within 2 business day to SEC when trade has taken place in their own companies. SEC RFD has required firms to frequently and timely disclose to investors because investors need this information to evaluate firms' performance so that they can make good investment decision. Furthermore, firms mandatory or voluntary disclose information to investors. Mandatory disclosure is mandated by regulation, but voluntary disclosure is not mandated by law; companies provide investors with extract information to attract them. Frequently and timely disclose of information will help decrease the information asymmetry problem among insiders and outside investors and increase long term investors. The next chapter describes the theories that are explaining information asymmetry.

Chapter 3: Theories explaining Information Asymmetry

3.1: Introduction

This chapter will discuss the importance of information asymmetry, the different theories that explain information asymmetry, the determinants of information asymmetry and the relation between information asymmetry and insider trading among insiders and investors. This chapter answers sub-question 4.

3.2: Information Asymmetry

Information asymmetry is a long live problem that exists from information difference and conflicting incentives between insiders and investors Healy & Palepu (2001). These differences exist when corporate insiders to business transactions have an information advantage over outsiders. This means that investors have insufficient information to evaluate firm's current and future performance or prospects Scott (2014). Investors should know how to distinguish useful and unimportant information and how to value this information to make good investment decision. If they cannot make this distinguish insiders will misuse this position to provided useless information instead of useful information to them. If investors are able to make these differences, then they can value information on an average level. It is important to know how to distinguish useful information from useless because based on the provided information they will analyze whether to invest in such in public company Healy and Palepu (2001). If information is only known by insiders it may probably further result in amoral hazard and adverse selection problem. Public firms should provide and disclose useful, transparent, reliable, unbiased and timely financial and non-financial information to outside investors. The reason why public companies should provided timely and reliable information to outside investors is to give investors the opportunity to evaluate the provided information whether it's useful so that they can make better investment decisions. Furthermore, disclosing useful, timely and efficient financial information to investors will give them the ability to know about companies operation assets, corporate governance, firm value and growth opportunities.

The role of information asymmetry is to improve operation of capital market and managerial labours markets Scott (2014). If investors have insufficient information about business performance than corporate insiders can mislead investors by providing them biased and unreliable information. To solve this problem business should disclose timely and frequently to investors about their current and future performance. Brown et al (2004) stated that conference calls are voluntary disclosures that lead to long-term reductions in information asymmetry among equity investors and frequently holding conference call will lower the cost of capital and is negatively related to the level of information asymmetry. Information asymmetry is important because is positively related with the cost of capital and uninformed investors demand a return to compensate for their risk of trading with private informed investors Brown et al (2014).Recent study Chang M et al. (2012) concluded that by holding privileged positions within firms, insiders can acquire excessive private benefits based on their informational advantage. This can be prevented when a firm is cross-listed on an exchange with higher regulatory and legal costs compared with its home exchange. Chu et al. (2010) further analyze the causes and consequences of information asymmetry. He concluded that the causes of information asymmetry are due to the financial crisis which weak the share returns and insiders with greater equity. Insider is protecting their share returns because of personal interest which can diminish share returns.

3.3: Adverse selection and moral hazard

Information asymmetry can be divided in two types namely, adverse selection and moral hazard problem. Scott (2014, p. 22) defines these two terms as follow. “*Adverse selection is when one or more parties to business transaction, or potential transaction, have an information advantage over other parties*”. This occurs when managers and other insiders have more information than outside investors. Managers know more about the firm financial performance, firm current and future conditions and prospects. The consequences of having more information than outside investors is that managers can bias the information to increase the value of stock options, delay information to mislead investors to invest in the firm.

Scott (2014, p. 21) defines moral hazard as: *“Moral hazard is when one or more parties to business transaction, or potential transaction, can observe their transactions in fulfillment of the transaction but other parties cannot”*.

According to Scott (2014, p. 22) *“Moral hazard occurs because of the separation of ownership and control that are characterizes most large business entities”*.

Fishman et al. (1992) indicated two adverse effects on insiders trading in the capital market. One of the effects is that it deters others traders from acquiring information and trading and second it skews the distribution of information held by traders. To help solve the problem of adverse selection financial accounting should know the desirable investors' need of information to make investment decision. To prevent the adverse selection and moral hazard problem inside information should be converted in outside information; firms must provide useful information to investors, control manager shirking and improve corporate governance Scott (2014). In the next paragraph the relevant accounting theories explaining information asymmetry will be elaborated on.

3.4: Accounting theories explaining information asymmetry

3.4.1: Positive Accounting Theories

Positive Accounting Theory (PAT) focuses on management motives in considering making accounting choices when agency cost and information asymmetry occur. Researcher has defined positive accounting theory in different ways. According to Scott (2014, p. 132) *“Positive Accounting Theory is concerned with the predicting such actions as the choices of accounting policies by firm managers and how manager will respond to proposed new accounting method.”*

Deegan et al. (2006, p.256) defines *“PAT as a theory that seeks to explain and predict particular phenomena”*. According to Watts and Zimmerman (1987, p. 7) *“PAT is concerned with explaining accounting practice. It is designed to explain and predict which firms will, and which firms will not, use a particular accounting method, but says nothing as to which method a firm should use”*. Positive accounting theory is relevant for information asymmetry because manager

can use accounting choices to influence reported earnings and shares prices. They will choose an accounting method to increase or undervalued stock price and may have the incentives to convey self serving information because of self interest. All these may lead to information asymmetry between managers and investors Amr Hassan (2012).

3.4.2: Agency theory

Deegan (2009, p. 265), defined “*agency theory as the relationship between shareholders and corporate managers which created much uncertainty due to various information asymmetries*”. Jensen and Meckling (1976, p.308) defined “*agency relationship as a contract under which one or more principals engages another agent to perform some service on their behalf which involves delegating some decision making authority to the agent*”. Agency relationship is the relation between managers and shareholders. This agency relationship leads to information asymmetry problem in the sense that managers have more power to get access to private information than shareholders (Jensen and Meckling 1976). Agents are corporate managers such as directors and principal are shareholders for instance investors. The principals expect and believe that the agent will take decision in his favor or act in the best interest of the principal, but this cannot always happened. It is sometimes impossible for the agent to make optimal decision in favor of the principal. The relation between the agent and the principal is sometimes difficult to make a decision and the agent will therefore expand bonding cost to ensure that the principal will not take action which will harm the principal welfare and if that happened he must be able to compensate the principal. The reason why the principal hire an agent is because he is unable to do all task by his self, therefore the principal trust an agent and think that the agent will always handle in his interest to maximize their wealth. In fact managers have access to private information of the firms, which means they have information advantage above the shareholder and therefore they will handle in their self interest. Further, the agent can act in the way of self interest to get bonus and maximize profit “Jensen& Meckling (1976)”. So to handle according to the principal expectations will lead to conflict with the agent’s personal interests. Based on the fact that managers are working in their self interest conflict will arise between the principal and the agent. This conflict is called agency problem Grossman et al. (2002). The agency problem between the principal and agent will cause information asymmetry between the principal and agent. Agency problem arises when investors or shareholders who invest in a public company

don't want to take the role of management and delegated their responsibilities to the company's management board. Therefore, management will act in their name and trusting them to take all business decision Healy & Palepu (2001). Optimal contract between investors and insiders can lead to solve the agency problem, for instance compensation agreements and debt contracts. Another possible mechanism to solve the agency problem is to let board of director monitor and manage on behalf of outside investors and finally to seek help of financial intermediaries such as financial analysts and rating agencies involve in companies financial production to help uncover manger misuse of firm resources Healy& Palepu (2001).

3.4.4: Signaling theory

Signaling theory is one of the theories that help explain and mitigate the information asymmetry problem in the capital market between insiders and investors. Signaling theory is trying to clarify the information asymmetry in the labormarket and to explain voluntary disclosure in corporate reporting Spence (1973); Shetana et al. (2014) and Ross (1977). Companies are competing with each other to show their better side to investors to attract investors and enhancing reputation in the capital market (Verrecchia (1983) and Shetana et al. (2014)). Therefore, companies try to voluntary disclose more information than mandatory in order to signal that they are better (Campbell et al. (2001) and Shetana et al. (2014)). This theory is very important for the information asymmetry problem because it can help mitigate and clarifying the information asymmetry problem as mention before among insiders and investors.

3.4.5: Possible solution of information asymmetry

In the existing literature *Diamond (1985) Bushman (1991) and Lundholm (1991)* documented that, by providing investors equal access to information and frequently reporting of financial information, information asymmetry will decrease because higher reporting frequency offers investors more opportunities to profit from private information. Information asymmetry will also decreases by increasing voluntary disclosure between management and investors. By increasing voluntary disclosure liquidity of firm's stock will improves which in turn will attract institutional investors. Increasing voluntary disclosure will be beneficial in the sense that it will lead to higher

institutional ownership, analysts following and lower cost of capital⁸. Other solutions of mitigating the information asymmetry problem are optimal contracts between insiders and investors which will provide incentives for full disclosure of private information. Healy & Palepu (2001), require managers to fully disclose their private information by stricter disclosure regulation and to uncover manager's superior information by financial analysts and rating agencies who are involved in private information production.

3.5: Summary

Information asymmetry exists when corporate insiders have information advantage over outside investors. Because of their position in the organization they gain access to all private information of the company. This information asymmetry blocks the outside investors to properly evaluate firms' current and future performance. Outside investors should be providing with timely, reliable and unbiased information. The investors need this information to make investing decision. Therefore, management of firms should disclose timely and frequently about their business environment to investors. Information asymmetry can be divided in moral hazard and adverse selection. Adverse selection is when manager has more information than outside investors and moral hazard focus on separation of ownership. This moral hazard problem is prevented by providing investors with useful information and convert inside information to outside information. If managers have more information than outside investors they will mislead the outside investors by providing them biased information and by manipulating information. Outside investors should have equal access to firms' private information as the insiders to prevent the information asymmetry problem. The different theories that are relevant for information asymmetry are positive accounting theory (PAT), agency theory and signaling theory. Positive accounting theory is to help management make accounting choices when information asymmetry occurs. Managers may use accounting choice to influence share prices because of self interests. Agency theory leads to information asymmetry due to inequality between shareholder and managers. The signaling theory helps to explain and to mitigate the information asymmetry problem between insiders and investors in the capital market. Information asymmetry decreases by providing investors with timely and useful information,

⁸The Icfai University Press

voluntary disclosure of information and give investors equal access to private information. The next chapter describes the prior research and related literature about this study.

Chapter 4: Prior research and related literature

4.1: Introduction

In previous chapter background information of SEC, RFD, insider trading, disclosure and information asymmetry are described. In this chapter sub-questions 5 and 6 will be answered. This chapter will focus on prior empirical researches which study the issue of insider trading, RFD and information asymmetry. The first paragraph 4.2 describes prior researches that are related with insider trading, 4.3 discuss studies about insider trading and information asymmetry and paragraph 4.4 continuous with researches regarding the relation between RFD and information asymmetry. Finally in 4.5 the summary of this chapter and a summary table of prior researches are presented.

4.2: Insider trading

Insider trading is playing an important role in the capital market in different countries across the world. Many researchers studied this issue from different perspectives. Insider trading is defined by securities law as the trading of stock or other securities by individuals in a company with the access to confidential and non-public information⁹. SEC has required companies to report frequently because of the fact that insiders has information advantages over outside investors and this information must be disclosed to the public or outside investors. Insider's use private information to trade their own shares with the intention to gain profit and to increase information advantages (Skaife et al. 2012).

Insider trading occurs in a profitable manner such as changes in wealth, preferences, consumption opportunities and taxes (Elliot et al. 1984) and by personal motives such as of tax burden, disposition effect and overconfidence (Kallunki et al. 2009). Jaffe (1974), Penman (1982), Seyhun (1986) indicates that insiders trade on privileged information to earn abnormal returns and that insiders buy stock before abnormal increase in stock prices and sell before the stock price decline (Ke et al. 2003). Furthermore, insiders who trade on inside information gain

⁹ www.sec.gov.com

larger profits than outside investors because they don't have access to private information of the firm.

SEC regulation of insider trading has been animated a lot of debate about insider trading in the market. Easterbroek (1985), Douglas (1988), Manove (1989) have documented some consequences of insider trading. They documented that insider trading is harmful for capital market because it can leads to loss of liquidity in the market, perception unfairness and loss of investors' confidence and preserve managerial incentives and increase information asymmetry which leads to higher market inefficiency (Dow et al. (2003). Besides this negative consequences insider trading has also benefits for capital markets. Manne (1966) and Young (1985) concluded that insider trading leads to informational efficient stock prices because it helps security prices to reflect rapidly underlying information which will lead to real investment. Another advantage of insider trading is that it provides meaningful forms of compensation in large corporations for the entrepreneurial function. Subsequently, insider trading can increased production (Dye 1984)) and that greater degree of informed trading decrease the returns of speculation, reduce hedging opportunities, increases investment efficiency and production efficiency (Dow et al. (2003).

Prior research and existing literature has found different results about insiders trading. Cheng et al. (2006) investigated the impact of insiders trading on market liquidity and found that insider trading damage the price and quantity of liquidity. Besides, the liquidity will decrease if directors trade heavily on the market because the cost of liquidity is a positive function of the trading activity. The reason why directors trade heavily is to hide their securities transactions for outside buyers and also to utilize private information with a long term nature. Noe C. F. (1999). Meulbroek L.K. (1992) analyzed the stock price effect on insider trading and indicated that insider trading is associated with the price, this means that insider trading significantly increases stock price.

4.3: Insider trading and information asymmetry

Several studies has been done about insider trade in different countries related with disclosure regulation and financial market, information asymmetry, insider transactions, R&D, insider gains etc. McLaughlin et al. (2008) show that regulated firms have lower level of information asymmetry, superior change in abnormal operating performance but their announcement period

returns are significantly less negative. Wittenberg-Moerman (2008) found that loan of public firms are trade at lower bid ask spreads and that loss recognition reduces the bid ask spread. QIANG CHENG et al. (2006) concluded that when manager are planning to buy share they reduce the bid price to increase the number of bad news forecasts. According to Noe R. (1999) managers employ other strategies for explaining private information when making insider transactions and clustering these transactions to gain more favorable stock price. Kallunki et al. (2009) stated that insiders with great or small proportion of their wealth to insider stock sell more or less before bad news earnings disclosures. Furthermore, Duymke et al. (2008) stated that members of the supervisory board appear to be the most active in exploiting inside information.

Other existing literature has highlights some important effects of insider trading and information asymmetry. The study of Frankel R et al. (2000) provides evidence that increased analyst following reduces profitability of insider trades and insider purchases. Chae J. (2005) stated that acumulative trading volume decreases inversely to information asymmetry prior to schedule announcement and market maker act appropriately by increasing price sensitivity before all announcements. Chu et al. (2010) found a negative relation between information asymmetry and share returns but Louis Cheng et al. (2006) show that increased share trading by insiders impairs liquidity. Brown et al. (2007) documented that a negative association between disclosure quality and information asymmetry is stronger in settings characterized by higher levels of firm-investor asymmetry. Frankel et al. (2004) found that financial statement informativeness is negatively associated with the frequency of insider purchases.

In recent research Wei Wu (2014) stated that corporate insiders obtain significantly higher abnormal returns and enjoy larger abnormal profits after the terminations of analyst coverage. Gow et al. (2011) found a positive association between disclosure precision and the cost of capital for firms whose shares trade in imperfect markets. Korczak et al. (2010) find that insider trading is more prevalent before good than bad news announcements, and insiders refrain from trading in the blackout periods before earnings disclosures. Jardak et al. (2004) investigated disclosure rules of changes in ownership structure and found that disclosure of changes in ownership structure improve investor protection and confidence. (Levine et al. 2003)) concluded that without disclosure, insiders may not be able to earn any rents because there is no market for

their shares. Too much disclosure may eliminate the insiders' potential for profit altogether. They further suggest that effective insider trading regulations could reduce the impact of information asymmetry on the cost of trading and price volatility. Cheng et al. (2006) provide evidence that higher levels of voluntary disclosure are significantly and negatively associated with bid-ask spreads and price volatility and negatively and insignificantly associated with trading volume.

Kaft et al. (2014) show that senior officers usually have more information about the firm and have more ability to influence the financial numbers and stock prices which give them the opportunity to strategically timing the selling and buying their own stock. Aboody et al. (2000) concluded that insider gains in R&D-intensive companies are significantly larger than insider gains in firms not engaged in R&D and that investors' reaction to the public disclosure of insider trades is significantly stronger for R&D companies than for No-R&D companies.

Bamber (1986) investigated the associations between unexpected earnings, firm size, and trading volume and stock exchange listing. The results show a continuous (positive) relationship between trading and security price results and a continuous inverse relationship between firm size and trading volume. Aktas et al. (2007) stated that the regulatory objectives of the public disclosure of insider trading are to reduce the information asymmetry between insiders and outsiders. However, there is always a delay between the insider trading and public announcement of such trading. Noe, C. F. (1999) concluded that managers take advantage of voluntary disclosures to make insider transactions when information asymmetry with outside investors is likely to be relatively low. Because managers control the timing and content of voluntary disclosures, the findings that insider transactions are concentrated after them and that managers appear to benefit from this behavior is suggestive of a causal relation.

Previous study Durnev (2005) shows that when both insiders and market professionals can trade on private information, insider trading restrictions become less effective if control rights of the largest shareholder are high and investor protection standards are weak. Durnev et al. (2007) extends his work by examining whether insider trading regulation, on average, deters private information trading. They documented that firms in countries with stricter insider trading restrictions are less subject to private information trading and that the amount of private information trading decreases significantly after the first enforcement of insider trading laws.

Rowland K. Atiase, Linda Smith Bamber find that trading volume reaction to earnings announcements is an increasing function of the magnitude of the associated price reaction and that the level of pre-disclosure information asymmetry are significantly positively related to trading volume reactions to earnings announcements, even after controlling for the magnitude of the associated price reaction.

4.4: Regulation Fair disclosure and information asymmetry

SEC implemented RFD with the intention to prevent and forbid selective disclosure by public firms. Selective disclosure had some negative impact on the financial capital market such as incentives for analysts to bias opinions to gain access to private information, favored clients to earn trading profit, reduce liquidity and increase firms cost of capital Zitzewitz (2002). Many believed that the implementation of regulation fair disclosure will solve the selective disclosure problem and will further leads to decreasing of the information asymmetry. And that it will also leads to adequate communication between insider and investors, more disclosure of relevant information and transparency but will decrease the quality of information. Chiyachantana et al. (2004) investigated the impact of regulation fair disclosure on information asymmetry and find that RFD decreased the level of information asymmetry. The level of information asymmetry decreases due to the fact that RFD has leads to more openness in communication between corporate insider and investors. According to Straser (2002), companies were disclosing more information to investors but of less quality only to meet the regulation requirements. Sunder et al. (2002) examined the impact of SEC regulation fair disclosure on information asymmetry with the focus on three main issues. They focused on the use of nonpublic channels for selective disclosure on information asymmetry, contribution of non public communications on the level of information asymmetry and the impact of RFD on the quality of voluntary disclosure. The result of this study shows that firms that selective disclose information have higher bids-ask spread compare with firms that don't use selective disclosure. They also find that RFD solved the differences in bid ask-spread and contributed to leveling information asymmetry among investors. Other empirical studies have been done about the relationship between disclosure and information asymmetry. Some researchers claim that more disclosure will decrease the

information asymmetry, increased the quantity and decrease the quality of information among insiders and investors. Sunder et al. (2002) documented a decrease in information asymmetry among investors by forbidden the use of nonpublic channels to disclosure information. In contrast, the study of Eleswarapu et al. (2004) investigated the changes in effective spreads and price and documented that the information flow remains unchanged after the implementation of RFD.

4.5: Summary

This chapter gives an overview of prior researches and related studies about insider trading, RFD and information asymmetry and also answers the sub-question 5 and 6. Researchers have studied the impact, relation, role, behavior, reactions of market makers about RFD and information asymmetry in the capital. In most of these studies multivariate test, matched paired, event study and different measurement is used. The results of these studies are mixed. Some of the studies documented that the information asymmetry among investors decreased Chiyachantana et al. (2004), openness in communication between insiders and investors, adequate information after the implementation of RFD. In contrast, Straser (2002) concluded that after the implementation companies started disclosing more information to the public but of low quality. Eleswarapu et al. (2004) claimed that information flows remain unchanged. The next chapter discussed the hypothesis development of the study. The summary table of prior research is also included in the appendix 1.

Chapter 5: Hypothesis development

5.1: Introduction

In this chapter the hypothesis of this thesis is formulated based on prior and empirical research described in the previous chapter. This chapter will also give an answer to sub question 7. Paragraph 5.2 discusses the hypothesis development and 5.3 provide a summary of the chapter.

5.2: Hypotheses development

This thesis examines the impact of SEC RFD on information asymmetry in the U.S. capital market. Managers may provide low quality and regularly disclosure to convince investors to invest in their company and to make investment decision. Low quality disclosure is also provided with intention to protect their private information against outside investors (Rogers J., (2008)). Van Buskirk (2012) established that providing regularly monthly revenue disclosures will not reduce information asymmetry, but more detailed (greater quantity) disclosure reduced information asymmetry. He also concluded that that relation between the disclosure and information asymmetry is multidimensional. Van Buskirk (2012) documented that the distinction between disclosure frequency and quantity is due to more frequent disclosure which provides an incentive increased private information acquisition by sophisticated investors. Gow et al. (2011) indicated that more precise disclosure can lead to an increase in information asymmetry. (SIDHU et al. (2008)) stated that the implementation of RFD has led to an increase in the expected cost of information asymmetry.

In contrast, Diamond (1985); Bushman (1991) and Lundholm (1991) shows that by providing investors equal access to information and frequently reporting of financial information, information asymmetry will decrease because higher reporting frequency offers investors more opportunities to profit from private information. Eleswarapu et al. (2004) established unchanged flow in information after the implementation of RFD.

Kim et al. (2001) stated that more disclosure by firm should lead to a smaller slope coefficient in volume trading. Brown S et al. (2007) found that quality of a firm's disclosures is negatively associated with the average level of information asymmetry which indicated that the relation is

primarily caused by a negative association between disclosure quality and the frequency of private information events. Frankel et al (2004) documented that corporations' timely disclosures of value relevant information and information collection by outsiders reduce information asymmetry and limiting insiders' ability to trade profitably on private information. Firms' transparency-enhancing activities decrease the information asymmetry between insiders and investors by revealing insiders' private information to investors in a timely manner Gu F. et al. (2012). Empirical and recent study (Veenman D. et al. 2012) documented that form 4 filings help investors find new information about future earnings. Brochet (2007) concluded that filings of insider have increases after the SOX.

Frijns et al. (2008) examined whether insider trading regulations reduce the degree of information asymmetry and the cost of trading. They find that that the introduction of the new legislation resulted in a significant decrease in the spread. Veenman (2012) finds that Form 4 purchase filings provide more useful information for firms and help investors learn about the persistence of previously reported earnings. According to Wu (2014) is the increase in insiders' abnormal returns stronger for firms that experience a larger reduction in the precision of the analysts' forecasts, and that analyst provide information to outside investors which reduce the informational advantage of insiders. Chiyachantana (2004) acknowledge a decrease in the level of information asymmetry and Eleswarapu (2004) established a decline in information flow after the introduction of Fair Disclosure. Frijns B et al. (2008) find a decrease of spread and information asymmetry after the implementation of new legislation of insider trading. Base on prior empirical research arguments and the above mention theories the following hypothesis is formulated:

Hypothesis (H₀): SEC Regulation Fair disclosure adoption reduces information asymmetry in the capital market.

Hypothesis (H₁): SEC Regulation Fair disclosure adoption increases information asymmetry in the capital market.

5.3 Summary

This chapter described the development of the hypothesis. The developed hypothesis will test whether the information asymmetry decreases after the implementation of RFD. Prior researches found different results on the topic of the impact of RFD on information asymmetry among investors. The next chapter gives a description of the research design of the study.

Chapter 6: Research Design

Introduction

This chapter provided an overview of the research design and answer sub question 7. Firstly, paragraph 6.1 describes the sample selection and data collection; secondly, the research method will be discussed in paragraph 6.3, paragraph 6.4 continuous with the predictive validity framework (Libby boxes). Finally, a summary of the chapter is presented in paragraph 6.5.

6.1 Sample selection

The total sample used in this empirical test consists of firms-years with available data in three sources of database. The data of this test is collected from the WRDS databases Compustat, CRSP and Thomson Reuters. The financial data such as total assets and firm size are collected from Standard & Poor's Compustat. Hereafter, Monthly trading volume, share outstanding, returns, share price and bid ask price are collected from and CRSP. After collecting the data, companies with missing data is eliminated and only companies with SIC code 2000- 3900 is included in sample due to data availability. The other companies with SIC code 0100 till 9900 except 2000- 3900 are excluded from the population due to lack of data. The sample start with a total of 23559 firm-years and ending with 3332 firms-years after eliminating the missing data and companies with share outstanding lower than 10.000. Next, the collected companies of Compustat and Center for Research in Security (CRSP) are matched with listed companies on the NYSE, Amex or NASDAQ in Thomson Reuter's database which are using Form 4 from the period September 1999 till December 2001. The initial sample of this study is all NYSE listed manufacturing U.S. companies which report to SEC and have a share outstanding of 10 million US dollar or more. The sample period before the regulation is from September 1999 to September 2000 and October 2000 to December 2001 as the period after the regulation. The reason why this sample period is chosen is to measure the effect of information asymmetry before and after SEC RFD in the U.S. capital market.

6.2: Research method

Regression model

In previous chapter the hypothesis of the study is developed based on result of prior researches. Those prior researches documented inconsistent results about the impact of Regulation FD on information asymmetry. Further, the independent and dependent variable of the thesis will be explained in the paragraph. The dependent variable is the information asymmetry, which will be measured by bid ask spread (Bid ask spread is the absolute differences between the quoted bid and ask price) and the independent variable is SEC mandated disclosure with form 4 filings as proxies(this is discussed in the next paragraph). Besides, the independent and dependent, variable control variable will be used because these are associated with the information asymmetry and to control endogeneity. To test the hypothesis of the thesis a different in different test and multivariate test will be used to test whether there is an increase or decrease in the information asymmetry and to explain the change in information asymmetry before and after SEC mandated disclosure in the U.S. Capital market. The regression models used in this thesis is derivated from prior studies of Sunder et al. (2002).

$$\text{SPREAD}_{it} = \beta_0 + \beta_1 \text{SECRFD}_i + \beta_2 \text{FIRMSIZE}_i + \beta_3 \text{TURNOVER}_i + \beta_4 \text{RETvolatility}_i + \varepsilon_i$$

Variable definitions

| Variable name | Variable definition |
|---------------|--|
| SPREAD | $(\text{Ask} - \text{Bid}) / ((\text{Ask} + \text{Bid}) / 2)$, <i>Ask</i> is the price at which the market maker is willing to sell, and <i>Bid</i> is the price at which he is willing to buy. |
| SECRFD | Is a dummy variable equal to one for the post- Reg. FD period (i.e.: after October 2000) and zero for the pre- Reg. FD period (i.e.: September 1999- September 2000). |
| FIRMSIZE | Firm size is computed as ln of total assets. |
| TURNOVER | Turnover = is equal to TRADING VOLUME/SHARE |

| | OUTSTANDING |
|---------------|--|
| RETvolatility | The standard deviation of returns; Volatility =stock return volatility; is computed as the standard deviation of monthly returns during the years. |
| ε | residual |

6.2: Variable definitions

6.2.1: Dependent variable

As mention before the dependent variable of this study is information asymmetry with bid ask spread as proxy. Bid ask spread is the absolute differences between the quoted bid and ask price (Sunder et al. 2002). Bid is the price that the investors or market maker is willing to pay for a share and ask is the price he is willing to sell his share. There are researches with other proxies for information asymmetry but in this study bid ask spread is used as a measure because several studies Cohen et al. (1986); Harris (1990); Lee and Ready (1991); indicated that the bid-ask spread captures market makers` disposition to trade at a low cost and that information asymmetry is associated with the market value of equity, share turnover and return volatility Stoll (1978), Chiang et al. (1988), and Glosten et al. (1988). Other researchers Leuz and Verrecchia (2000) claimed that the bid-ask spread is believed to be the most appropriate measure for information asymmetry because Yoon et al. (2011) when information asymmetry increases, the bid-ask spread increases too. Sunder et al. (2002) concluded that market makers used bid ask spread to measure information asymmetry because it help recover losses. As firm size, audit type, turnover, volatility and stock price variables are associated with information asymmetry, they are incorporated as control variables. The bid ask spread is computed as in this study as follows:

$$\mathbf{(Ask - Bid) / ((Ask + Bid) / 2) \quad (1)}$$

6.2.2: Independent variable

The independent variable of this study is SEC RFD and is measure by SEC form 4 filings. This form is a digital form which must be filed to report to SEC when an insider executes a transaction. This form is required by SEC to inform the public about insider transactions of company securities and must be filed within two business days after the transaction date¹⁰.SEC implement this form to lower the information asymmetry between inside and outside investors. This dummy variable equals to one for the post- RFD period (i.e.: after October 2000) and zero for the pre- Reg. FD period (i.e.: March 1999-October 2000). Prior research highlights other factors which are associated with the dependent variable and which can affect it. Further, 5 control variables are used which are associated with information asymmetry in this study. Those control variables are included to control for the endogeneity problem. The control variables are described separately below.

Firm size

Firm size is defined as a significant variable since the socially responsible behavior disclosed by larger firms tend to be more than those disclosed by smaller firms (Waddock and Graves 1997). Empirical studies Cooke (1989); Botosan (1997); Premuroso and Bhattacharya (2008), documented a positive and significant association between firm size and firm disclosures. Camfferman and Cooke (2002) concluded that firm size is a very important variable because it has a positive relationship with disclosure extent. Chiang and Venkatesh (1988); Hasbrouck (1991); Greenstein and Sami (1994); Leuz and Verrecchia (2000); Easley et al. (2002), and Yoon et al. (2011) found a negative association between firm size and information asymmetry proxy measures. Moreover, larger firm are inclined to reveal more financial information because first, disclosing of more information can influence the future cost of the firm to obtain new funds Botosan (1997); second, large-sized firm possess more financial resources compared to small sized and finally, large firms are exposed more to the public attention than small firm and consequently they respond to this pressure by increasing disclosures. Firm size is computed as natural logarithm of assets in this study.

¹⁰<https://www.investor.gov/news-alerts/investor-bulletins/investor-bulletin-insider-transactions-forms-3-4-5>

Turnover

Turnover rate indicated the trading volume in a specific time period for a certain company divided by the total number of shares of the company's stock, similar as trading volume, turnover rate indicates the degree of trading activity. Moreover, such as "Copeland and Galai (1983)" claimed that trading activity is negatively associated with information asymmetry; therefore the turnover rate has to be also negatively correlated with information asymmetry Yoon et al. (2011) research. According to Hirshleifer and Teoh (2003) investors are unable to process all the available information they need because they have limited time to select all the needed information. Investors find it difficult to less useless analyze and understand firm disclosures because the cost associated with the information seems to be surpass the benefits of it Blankespoor et al. (2012). Moreover, Bloomfield (2002) and Miller (2010) claimed that investors' trade when information is easier to process and they are less inclined to trade when the data is more difficult to conceive. The turnover will be computed as follows;

TRADING VOLUME/SHARE OUTSTANDING

Return Volatility (Volatility)

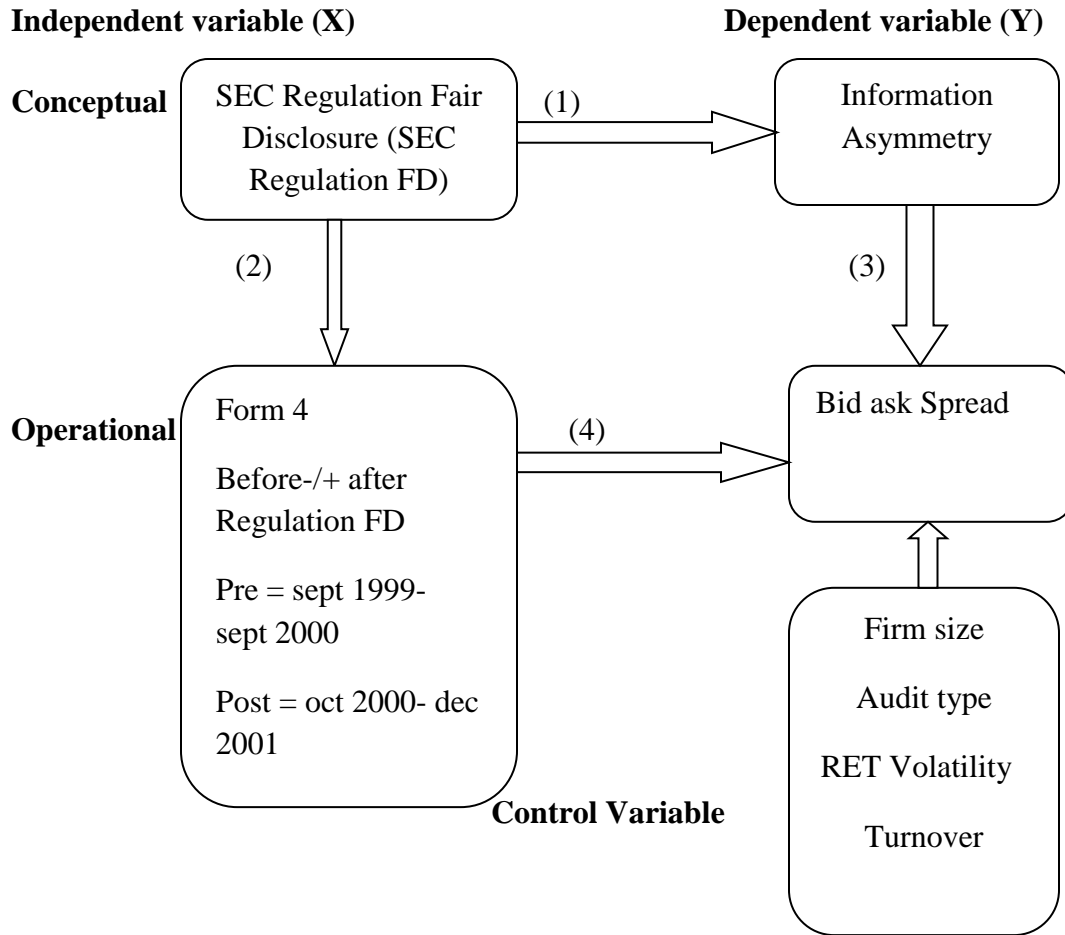
Stock price volatility can be defined as the standard deviation of return from a particular security for a certain period of time. A higher volatility implies that the securities' value can be spread over a larger range of value. This indicated that the prices of the securities can change in a short period dramatically. When information asymmetry is low, than the stock price volatility inclined to be low if the capital market is efficient. Wang (1993) stated that there is a positive association between stock price volatility and information asymmetry measure proxy because when the information asymmetry increases, the stock price volatility might increase too as a result of the severe adverse selection among traders. The volatility can be measure in different way. One measure is the variance between returns from the same security and the second is the beta¹¹.The price volatility is computed as the standard deviation of prices in this study.

¹¹<http://www.investopedia.com/terms/v/volatility.asp#ixzz3dL3LPB1w>).

6.4 Predictive validity framework (Libby boxes)

The predictive validity framework which is better known as Libby boxes is depicted in this paragraph below. The Predictive validity framework is a tool which is widely used in experimental accounting research which is extremely helpful in setting up studies and its research design. The Libby boxes simplify the thoughts process for 90% of the accounting research studies that are interesting in examining causal relation among generally unobservable concepts. This framework consists of four boxes and five links which describe the relation between the dependent, independent, control variables, explain the construct, internal and external validity in a study. Further, it operationalize the unobservable theoretical concept of this study (Libby, 1981).The first link in the framework captures the hypothesized causal relation which reflects the theoretical supports of the predicted effect of X on Y. In this study link one reflects the impact of the RFD on information asymmetry. The second and third link reflects the operationalizations or measurements of X on Y. In this case these links reflects the operationalizations of RFD on information asymmetry. Link four reflects the causal relation the study is empirical testing. In this study link four shows the causal relation between form 4 before and after the regulation and bid ask spread. The last link reflects the effect of other factors on the outcome Y. It reflects the effect of the control variables such as firm size, audit type, turnover and price volatility on information asymmetry. The boxes in the framework reflect the theory domain of the concepts of interest.

Figure: 1 Predictive validity framework



This thesis investigates the impact of SEC RFD on information asymmetry in the U.S. capital market before and after the implementation. Because the SEC RFD and information asymmetry are unobservable in the research question that's why they are operationalize so that they can be measure. SEC RFD is the independent variable of the study which is measure by a dummy variable form 4. The dependent variable is the information asymmetry with bid ask spread as proxy. Firm size, audit type, turnover and price volatility are included as control variables. The Libby boxes consist of a conceptual and operational part. The conceptual link presents the SEC RFD and information asymmetry and describes the theoretical part of the study. While the link operational presents form 4 and bid ask spread which reflects the empirical part of the study. At least, the last box represents the control variable which is associated with the dependent variable.

It very important to know about the internal and external validity of a research design is low or high. The validity of a research design refers to how well a test addresses the research question. In other words, the degree to which a research study measure what it should measure. The following two types of validity are distinguished.

Internal validity refers to how well a study captures a causal effect of X on Y after eliminating alternative hypotheses. Without some degree of internal validity, we do not know what we are actually measuring (Smith 2011). In the framework above arrow 4 is visualizes the internal validity of the research. **External validity** is how well the results from a study can be applied to other settings, i.e., the extent to which results based on a sample can be generalized to the general population (Smith 2011). Arrow 1 of figure 1 is representing the external validity of this study.

This study is an observational study which uses real world data collect as mentioned in paragraph 6.1 from Compustat, the Thomson Reuters, and CSRP database. Generally, observational study (quasi- experimental) have relatively high external validity but low internal validity, but in this study it is the opposite. The external validity is low and the internal validity of the study is high. The external validity of this study is low because the result of the study cannot be generalized to other setting outside the U.S. The sample which is investigated is relatively small compared to the population and most importantly, not randomly selected from the population. The regulation concerning FD form 4 fillings is only mandatory for U.S. listed companies. This research cannot be generalized to other countries. **Construct validity** is the degree to which a measurement (operationalization of a construct) captures the underlying theoretical construct it is supposed to measure (Smith 2011). Arrow 2 and 3 visualizes the construct validity in this thesis. The construct validity is high. In order to measure the SEC RFD form 4 is used because the Form 4 is collected from the databases of U.S. listed companies that report according SEC before and after the implementation of the new regulation while bid ask spread is used to measure information asymmetry.

6.5: Summary

This chapter presents the research design of this thesis and answer sub-question seven. At the first place the sample collection of the study is described. This paragraph discussed how the data is collected and the sample of the study. The data of this study are collected from different databases such as Thomson Reuters, Compustat and CSRP database. After collecting data, firms with missing data were eliminated. In addition, the regression model and control variable which are used to do the test hypothesis is also presented. Finally, a predictive validity framework is depicted to describe the research process of this study. In the next chapter the empirical result of the study is presented.

Chapter 7: Emperical results

7.1: Introduction

This Chapter describes the empirical part of the study and in order to give an answer on sub questions eight and nine. It explains the findings of the different analysis's about the impact of SEC RFD on information asymmetry. Paragraph 7.2 present the descriptive statistic, which provide insight about the mean, standard deviation and number of observations in this study. Paragraph 7.3 gives an overview of the multiple regression analysis before and after winsorizing, the next paragraph present robustness checks and control for multicollinearity and the last paragraph gives a summary of the chapter.

7.2: Descriptive statistic

This thesis focuses on the spread before and after the implementation of regulation fair disclosure in the capital market. Before performing the empirical test of the study by plotting the regressions it is essential to test first whether the regression is normal distributed. Because is assumed that the research model should be linear and normal distributed. Therefore, the basic assumptions as a normality test, homoscedasticity and multicollinearity test should be done to test whether the model is linear and if the assumptions are violated. First, a normality test is to determine whether the data in a sample is normal distributed. There are several ways to test the assumptions of normality. First, plot a histograms and corresponding P-P plot (probability – probability plot) to check the skewness and kurtosis of the data. The values of the skewness and skurtis should be zero if the data are normally distributed. Another way to test for normality is a Kolmogorov-simrnov and Sharpiro-Wilk test. This test is a test whether a distribution of scores is significantly different from a normal distribution (Field 2009). The test is not significant and probably normal if $p > 0.05$ and otherwise (see appendix 2).

The second assumption is the homoscedasticity test. This is an assumption in a regression analysis that the residuals at each level of the predictors' variables have similar variance (Filed, 2009). If this is not the case than the data sample is hetroscedasticity which can bias the statistical analysis. Scatterplot is plotting to test for homoscedasticity (see appendices 8 and 14).

The last assumption is a multicollinearity test. This test was also done for the sample to check whether there is strong or weak correlation between the predictors in the model. Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model. Multicollinearity is identified by scanning a correlation matrix of all the predictor values and check whether the correlation is very high (above 0.80 or 0.90) (Field, 2009). Variance inflation factors (VIF) test was done to identify multicollinearity in the sample. The VIF indicated whether a predictor has a strong linear relationship with the other predictors (Field, 2009). Table 3c is showing that before and after the adaptation there is no problem of multicollinearity because the VIF values are below 10 for both periods (see table 3c). The next paragraph will describe the robustness check of the study.

After doing these tests, analysis and graphs were plotted before and after the adoption of SECREFD to see the effect of the regulation. To check for outliers a histogram is plotted (appendix 3). An outlier is an extremely large or small value of an observation for a specific variable that has the ability to individually alter the outcome of a statistical test (Field, 2009). Researchers should care about outliers because it can skew the distribution, affect the values of the estimated regression coefficients and also bias the model (Field 2009). There are two common ways to deal with outliers namely trimming and winsorizing. Trimming is eliminating data points from an analysis when data is out of range, entry error and when data is biased to allow for more robust statistical analysis. Winsorizing is a procedure of outlier filtering the process of setting extreme values of observations for a specific variable equal to less extreme values in order to mitigate the potential spurious effects of outliers on statistical tests. Field 2009 defined winsorizing as the replacing of the smallest and largest values by the mean of the data within the observations. The sample used in this thesis has outliers and winsorizing is used to deal with the outliers. The histogram in appendix 3 shows that the distribution is not normal and skewed to the left for the spread.

Table 1: Descriptive statistic for the total sample of 76 US listed firms before and after SEC RFD (September 1999-December 2001

| Descriptive Statistics | | | |
|------------------------|------------------|-------------------|----|
| SECRFD | Mean | Std. Deviation | N |
| 0 SPREAD | -.00611972636780 | .005049028746634 | 74 |
| Firmsize | 5.97831025313438 | 1.677680626413125 | 74 |
| Turnover | 3.49070324029188 | 2.157290718226810 | 74 |
| RETvolatility | .28945767758065 | .171015077337495 | 74 |
| 1 SPREAD | -.00769097394724 | .005969874547946 | 72 |
| Firmsize | 6.24073683278397 | 1.733772645392039 | 72 |
| Turnover | 2.91277794347408 | 2.052661728206477 | 72 |
| RETvolatility | .19850499673473 | .084179596926033 | 72 |

Table 1 provide descriptive statistic of the sample before and after the implementation of SECRFD. The descriptive statistic consists of 76 firms in the sample period before and after the implementation of SEC regulation fair disclosure over the period 1999 – 2001. The table is giving an overview of the average and standard deviation of the spread, firm size, returns volatility and turnover before and after SECRFD. Table 1 shows before the implementation a mean values of the bid ask spread and the volatility of respectively -.00611 and 0.2894. The average of turnover and firm size are respectively 3.4907 and 5.978. The table is also presenting a mean values of the bid ask spread and volatility after SECRFD of respectively -.00769 and 0.1985. The mean value of turnover and firm size are 2.9127 and 6.240 respectively. The average spread decrease after the adoption. Further we can conclude from the tables that RETvolatility and turnover also decrease after SECRFD. The next paragraph provide information about the correlation, regression of the dependent and independent variables, robustness check and to test the impact of firm size, turnover and volatility on the spread.

7.3: Correlation results

Table 2: Pearson correlation

| SECRFD | | Correlations | | | | |
|--------|---------------|---------------------|----------|----------|---------------|---------|
| | | SPREAD | Firmsize | Turnover | RETvolatility | |
| 0 | SPREAD | Pearson Correlation | 1 | .307** | .353** | -.234* |
| | | Sig. (2-tailed) | | .008 | .002 | .045 |
| | | N | 74 | 74 | 74 | 74 |
| | Firmsize | Pearson Correlation | .307** | 1 | -.216 | -.558** |
| | | Sig. (2-tailed) | .008 | | .065 | .000 |
| | | N | 74 | 74 | 74 | 74 |
| | Turnover | Pearson Correlation | .353** | -.216 | 1 | .460** |
| | | Sig. (2-tailed) | .002 | .065 | | .000 |
| | | N | 74 | 74 | 74 | 74 |
| | RETvolatility | Pearson Correlation | -.234* | -.558** | .460** | 1 |
| | | Sig. (2-tailed) | .045 | .000 | .000 | |
| | | N | 74 | 74 | 74 | 74 |
| 1 | SPREAD | Pearson Correlation | 1 | .359** | .456** | -.028 |
| | | Sig. (2-tailed) | | .002 | .000 | .818 |
| | | N | 72 | 72 | 72 | 72 |
| | Firmsize | Pearson Correlation | .359** | 1 | .077 | -.462** |
| | | Sig. (2-tailed) | .002 | | .521 | .000 |
| | | N | 72 | 72 | 72 | 72 |
| | Turnover | Pearson Correlation | .456** | .077 | 1 | .477** |
| | | Sig. (2-tailed) | .000 | .521 | | .000 |
| | | N | 72 | 72 | 72 | 72 |
| | RETvolatility | Pearson Correlation | -.028 | -.462** | .477** | 1 |
| | | Sig. (2-tailed) | .818 | .000 | .000 | |
| | | N | 72 | 72 | 72 | 72 |

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A multiple regression analysis is performed to investigate the effect of the adoption of SECRFD on information asymmetry. Table 2 present a Pearson correlation analysis before and after the implementation of SECRFD. The table is indicating that before the adoption of SEC the control variables firm size and turnover are significant at the 1% level, this is implying that those two variables are helping explaining the firms bid ask spread. Firm size and turnover are positively correlated with spread respectively 0.307 and 0.353. While RETvolatility is negative correlated with spread at 0.05 level (-0.234). After the implementation of SECRFD the two control variable are still significant at the 0.01 level, but RETvolatility is not significant. The correlation between spread and firm size and turnover increases respectively to 0.359 and 0.456 and is positive correlated after the adaption.

7.4: Regression results

Table 3a

| SECRFD Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|--------------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 0 1 | .598 ^a | .357 | .330 | .004133226069413 | .357 | 12.978 | 3 | 70 | .000 |
| 1 1 | .572 ^c | .327 | .297 | .005004902406189 | .327 | 11.006 | 3 | 68 | .000 |

a. Predictors: (Constant), RETvolatility, Turnover, Firmsize

b. Dependent Variable: SPREAD

c. Predictors: (Constant), RETvolatility, Firmsize, Turnover

Table

3b

Anova

| SECRFD Model | | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|------------|----------------|----|-------------|--------|-------------------|
| 0 1 | Regression | .001 | 3 | .000 | 12.978 | .000 ^b |
| | Residual | .001 | 70 | .000 | | |
| | Total | .002 | 73 | | | |
| 1 1 | Regression | .001 | 3 | .000 | 11.006 | .000 ^c |
| | Residual | .002 | 68 | .000 | | |
| | Total | .003 | 71 | | | |

a. Dependent Variable: SPREAD

b. Predictors: (Constant), RETvolatility, Turnover, Firmsize

c. Predictors: (Constant), RETvolatility, Firmsize, Turnover

test

Table 3c: regression

| SECRFD Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Statistics | |
|--------------|---------------|-----------------------------|------------|---------------------------|--------|------|---------------------------------|-------------|-------------------------|-----------|
| | | B | Std. Error | | | | Beta | Lower Bound | Upper Bound | Tolerance |
| | | 0 1 | (Constant) | -.012 | .003 | | -4.135 | .000 | -.017 | -.006 |
| | Firmsize | .001 | .000 | .223 | 1.929 | .058 | .000 | .001 | .687 | 1.455 |
| | Turnover | .001 | .000 | .572 | 5.294 | .000 | .001 | .002 | .786 | 1.272 |
| | RETvolatility | -.011 | .004 | -.373 | -2.933 | .005 | -.018 | -.004 | .568 | 1.760 |
| 1 1 | (Constant) | -.015 | .004 | | -4.136 | .000 | -.022 | -.008 | | |
| | Firmsize | .001 | .000 | .247 | 2.032 | .046 | .000 | .002 | .672 | 1.489 |
| | Turnover | .001 | .000 | .513 | 4.187 | .000 | .001 | .002 | .660 | 1.514 |
| | RETvolatility | -.011 | .010 | -.158 | -1.147 | .256 | -.031 | .008 | .522 | 1.915 |

a. Dependent Variable: SPREAD

Table 3 is providing results from the regression in which the dependent variable is the bid-ask spread. In this table the summary statistics is presented. The table is showing that the R² before and after the adoption is respectively 0.357 and 0.327. This is implying that respectively 35.7%

and 32.7% of variation in spread is explaining by the independent variable SECRFD before and after the adoption of the regulation. The R^2 is explaining the fit of the model, and provides information about the portion of the variation in de dependent variable and independent variable. The higher the R square the better fit of the model (ideal value = 1). Further, the summary is showing an R of respectively 0.598 and 0.572. The R is explaining the correlation between the spread, firm size, turnover and Retvolatility before and after the adoption of SECRFD. The F-ratio of both periods is 12.978 and 11.006 significant at $p < 0.05$ (see table 3b). From table 3c implying a negative correlation with spread and SECRFD, the intercept is -0.012 before the adoption and -0.015 after. This is indicating that the adoption SECRFD decreases the information asymmetry in the capital market. The table is also providing information that the control variable turnover is positive significant correlated with spread before and after the adoption, firm size is positive not significant correlated with spread but RETvolatility is negative significant correlated with the spread before the adoption and negative not significant correlated with spread after the adoption.

7.5: Robustness check

A robustness check was performed to check whether the result is still representative and which model is better. Data over de month October 2000 was excluded and share prices are included to the data set. October is excluded to eliminate early adopters. Share price is the price of one share or stock. Researchers found inconsistent results for the relation between share prices and bid ask spread. For example prior researches Roulstone (2000) and Venkatesh et al (1986) claimed that share price have a negative association with the bid ask spread. In contrast, Amihud et al (1996), Glosten et al. (1988) documented and positive correlation between bid ask spread and share price. The share price is calculated in this study as the average price of the stock for each company in the sample period. Hereafter, SPSS regression was process again. The following regression is used to perform the robustness check:

$$\mathbf{SPREAD}_i = \beta_0 + \beta_1 \mathbf{SECRFD}_i + \beta_2 \mathbf{FIRM\ SIZE}_i + \beta_3 \mathbf{TURNOVER}_i + \beta_4 \mathbf{RETVOL}_i + \beta_2 \mathbf{SHARE}_i + \mathbf{PRICE}_i + \varepsilon_i$$

In this test multicollinearity test is also performed. According to the table above is the multicollinearity for both periods not violated. The VIF values are in both cases lower than 10 (VIF<10) (see table 6c).

Table 4: Descriptive statistic after robustness

| Group Statistics | | | | | |
|------------------|--------|----|-------------------|--------------------|-------------------|
| | SECRFD | N | Mean | Std. Deviation | Std. Error Mean |
| SPREAD | 0 | 72 | -.00567200905972 | .004322436768856 | .000509404058418 |
| | 1 | 68 | -.00674824972992 | .004490410451691 | .000544542252785 |
| FIRMSIZE | 0 | 72 | 6.01075874771252 | 1.688091604765058 | .198943503498909 |
| | 1 | 68 | 6.37168841982774 | 1.690879982803466 | .205049316745331 |
| TURNOVER | 0 | 72 | 3.54117520331059 | 2.161057171791384 | .254683030117585 |
| | 1 | 68 | 2.96504652356916 | 2.042736128529497 | .247718141858600 |
| RETvolatility | 0 | 72 | .28801673796716 | .172762292481339 | .020360231424481 |
| | 1 | 68 | .19854388658282 | .087154992449392 | .010569095284375 |
| SHARE PRICE | 0 | 72 | 44.53417139423076 | 26.515311789251474 | 3.124859461909221 |
| | 1 | 68 | 28.95194309873949 | 17.927103899871828 | 2.173980674723348 |

Table 4 presents the descriptive statistic of the test after a robustness check was performed. This table shows an average mean of the bid ask spread, before and after the adoption of respectively -0.0056 and -0.0067. Turnover, RETvolatility and share price decrease with an average mean of respectively 2.965, 0.1985 and 28.95 after the adoption of regulation fair disclosure. This indicates that the average mean in spread, turnover, RETvolatility and share price declines after the adoption. While the test indicates an increase in the average mean of firmsize after the adoption.

Table 5 Pearson correlation

| | | Correlations | | | | |
|---------------|---------------------|--------------|----------|----------|---------------|-------------|
| SECRFD | | SPREAD | FIRMSIZE | TURNOVER | RETvolatility | SHARE PRICE |
| 0 SPREAD | Pearson Correlation | 1 | .290* | .335** | -.244* | .625** |
| | Sig. (2-tailed) | | .013 | .004 | .039 | .000 |
| | N | 72 | 72 | 72 | 72 | 72 |
| FIRMSIZE | Pearson Correlation | .290* | 1 | -.235* | -.556** | .524** |
| | Sig. (2-tailed) | .013 | | .047 | .000 | .000 |
| | N | 72 | 72 | 72 | 72 | 72 |
| TURNOVER | Pearson Correlation | .335** | -.235* | 1 | .469** | .208 |
| | Sig. (2-tailed) | .004 | .047 | | .000 | .079 |
| | N | 72 | 72 | 72 | 72 | 72 |
| RETvolatility | Pearson Correlation | -.244* | -.556** | .469** | 1 | -.216 |
| | Sig. (2-tailed) | .039 | .000 | .000 | | .069 |
| | N | 72 | 72 | 72 | 72 | 72 |
| SHARE PRICE | Pearson Correlation | .625** | .524** | .208 | -.216 | 1 |
| | Sig. (2-tailed) | .000 | .000 | .079 | .069 | |
| | N | 72 | 72 | 72 | 72 | 72 |
| 1 SPREAD | Pearson Correlation | 1 | .248* | .419** | .003 | .371** |
| | Sig. (2-tailed) | | .041 | .000 | .978 | .002 |
| | N | 68 | 68 | 68 | 68 | 68 |
| FIRMSIZE | Pearson Correlation | .248* | 1 | .015 | -.460** | .708** |
| | Sig. (2-tailed) | .041 | | .904 | .000 | .000 |
| | N | 68 | 68 | 68 | 68 | 68 |
| TURNOVER | Pearson Correlation | .419** | .015 | 1 | .504** | .038 |
| | Sig. (2-tailed) | .000 | .904 | | .000 | .760 |
| | N | 68 | 68 | 68 | 68 | 68 |
| RETvolatility | Pearson Correlation | .003 | -.460** | .504** | 1 | -.545** |
| | Sig. (2-tailed) | .978 | .000 | .000 | | .000 |
| | N | 68 | 68 | 68 | 68 | 68 |
| SHARE PRICE | Pearson Correlation | .371** | .708** | .038 | -.545** | 1 |
| | Sig. (2-tailed) | .002 | .000 | .760 | .000 | |
| | N | 68 | 68 | 68 | 68 | 68 |

*. Correlation is significant at the 0.05 level (2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5 presents result of the correlation between the spread, the adoption of SEC and the control variables. The results in table 5 indicates that spread has a positive significant correlation with firm size at 0.05 level and a positive significant correlation with Turnover and Share price at 0.01 but a negative significant correlation with RETvolatility at 0.05 level before the adoption of SECRFD. After the adaption the correlation of the spread and turnover increases to 0.419 at 0.01 level. The correlation between spread and RETvolatility also increase to 0.003 but is not significant. The table is further showing that the correlation between spread and share price decreases but significant at 0.01 level and the correlation between firm size decrease and significant at 0.05 level.

Table 6a: summary model

| Model Summary ^b | | | | | | | | | | |
|----------------------------|---|-------------------|-------------------|----------------------------|-------------------|----------|--------|-----|---------------|------|
| SECRFD Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | |
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 0 | 1 | .714 ^a | .510 | .481 | .003114551617712 | .510 | 17.437 | 4 | 67 | .000 |
| 1 | 1 | .550 ^c | .302 | .258 | .003867707447836 | .302 | 6.828 | 4 | 63 | .000 |

a. Predictors: (Constant), Share Price, TURNOVER, RETvolatility, FIRMSIZE

b. Dependent Variable: SPREAD

c. Predictors: (Constant), Share Price, TURNOVER, FIRMSIZE, RETvolatility

Table 6b: anova

| ANOVA ^a | | | | | | | |
|--------------------|---|------------|----------------|----|-------------|--------|-------------------|
| SECRFD Model | | | Sum of Squares | df | Mean Square | F | Sig. |
| 0 | 1 | Regression | .001 | 4 | .000 | 17.437 | .000 ^b |
| | | Residual | .001 | 67 | .000 | | |
| | | Total | .001 | 71 | | | |
| 1 | 1 | Regression | .000 | 4 | .000 | 6.828 | .000 ^c |
| | | Residual | .001 | 63 | .000 | | |
| | | Total | .001 | 67 | | | |

a. Dependent Variable: SPREAD

b. Predictors: (Constant), Share Price, TURNOVER, RETvolatility, FIRMSIZE

c. Predictors: (Constant), Share Price, TURNOVER, FIRMSIZE, RETvolatility

The results in table 6a indicate that after the adoption the R² decreases to 30.2% and the R decreases to 0.55, this imply that there is strong correlation between spread and the control variables. Subsequently, the F-ratio decreases after the adoption with 6.828 but significant at P<0.05 (see table 6b).

Table 6c: regression

| Coefficients ^a | | | | | | | | |
|---------------------------|---------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| SECRFD Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 0 | ^ (Constant) | -.008 | .002 | | -3.695 | .000 | | |
| | FIRMSIZE | .000 | .000 | -.094 | -.781 | .438 | .504 | 1.986 |
| | TURNOVER | .001 | .000 | .374 | 3.543 | .001 | .658 | 1.520 |
| | RETvolatility | -.009 | .003 | -.360 | -3.169 | .002 | .567 | 1.764 |
| | SHARE PRICE | 8.458E-5 | .000 | .519 | 4.723 | .000 | .606 | 1.650 |
| 1 | ^ (Constant) | -.011 | .003 | | -3.940 | .000 | | |
| | FIRMSIZE | -5.787E-5 | .000 | -.022 | -.145 | .885 | .488 | 2.049 |
| | TURNOVER | .001 | .000 | .416 | 3.070 | .003 | .603 | 1.658 |
| | RETvolatility | -.001 | .008 | -.020 | -.124 | .902 | .418 | 2.391 |
| | SHARE PRICE | 9.015E-5 | .000 | .360 | 2.150 | .035 | .395 | 2.530 |

a. Dependent Variable: SPREAD

According to table 6c there is still a negative significant correlation with SECRFD and the spread also decrease after the implementation of SECRFD. The spread is positive significant correlated with turnover before and after the adoption. Between Spread RETvolatility and Share price a negative significant correlation and a positive not significant correlation between spread and firm size before the adoption of SECRFD. After the implementation the correlation between spread and turnover stay positively significant. Further, firm size, RETvolatility and share price is negative significant correlated with the spread. After included and exclude variables to the data the spread still negative correlated with SECRFD before and after the adoption and it does not affect the result of the test. Overall, the results of both test is consistent with the notion that SECRFD decreases information asymmetry after the adaption of form 4 in the US capital market. In the different analysis it shows that spread has a negative significant correlation with SECRFD and that the spread decreases after the adoption of the new regulation. With the results of this test we can accept the H_0 and reject H_1 . This results is consistent with the study of Chiyachatana (2004) et al., Sunder (2002), Mclaughlin (2008) at al., Eleswarapu (2004) et al., they all documented that information asymmetry decreases after the implementation of SECRFD.

7.6: Summary

This chapter is presenting the empirical result of the study and answering sub questions eight and nine. First of all a normality test is done to check outliers, thereafter the outliers were winsorized and than descriptive statistic and regression in SPSS was running. Next, the results of the different regression and graphs were analyzed to answer the hypothesis. The test perform in this study before doing the robustness check indicate a decline in the bid ask spread after the adoption of regulation fair disclosure (see table 1). Table 2 is providing a Pearson correlation between the spread and control variables. This test is presenting a positive correlation between spread, firm size and turnover at 0.01 level and a negative correlation between spread and RETvolatility at 0.05 level. Table 3a is indicating that 32.7% of the model is explaining by the spread after the adoption of the regulation. This model is also showing that there is a strong

correlation between spread and the control variables ($p < 0.05$). The model is indicating that spread has a negative significant correlation with SECRFD, positive significant positive correlation with turnover, a positive insignificant correlation with firm size and negative insignificant correlation with RETvolatility.

Furthermore, other statistical test such as multicollinearity test and robustness check was also done to check the validity of the result. In this test the month October was excluded to eliminate early adapters and share price was included to see whether these variables affect the result of the test. According to the multicollinearity test it is confirm that the assumption of multicollinearity is not violated in both tests. After the robustness check the descriptive statistic table is indicating a decline in the average spread turnover and RETvolatility and share price before and after the adoption and an increase in firm size in both periods. Further, table 5 is presenting that a positive correlation with firm size and turnover at respectively 0.05 and 0.01 level. While share price is negatively correlated with the bid ask spread at 0.01 level. Moreover, the regression in table 6c is determined a negative correlation between bid ask spread and SECRFD in both periods. Overall, the results of both test show that SECRFD decrease the bid ask spread after the adoption and that both variable are negative correlated. The result of the test is answering the research question and also confirm that the implementation of regulation fair disclosure impact the information asymmetry among investors in U.S capital market.

Chapter 8: Conclusion

8.1: Introduction

This chapter provides a summary of the results of the study and answers to the sub questions and main research question. Paragraphs 8.2 discuss the main findings of the study. The next paragraph explains the limitations and finally the contribution and recommendation for further research are discussed.

8.2: Summary and conclusion

This thesis investigates the impact of SEC RFD of insider trading on information asymmetry in the US capital market. Prior empirical researches have been done on this topic but inconsistent result was found and there is still ongoing debate about this issue. Because insiders gain information assess above the outside investors which created information asymmetry among inside investors and outside investors, SEC implemented new regulation which lowered the information asymmetry among investors. The main purpose of this regulation is to protect investor from misleading by insider. The SEC has required public companies to disclose frequently about trade in their own company within two business days. The research question of this study is:

Does SEC Regulation Fair Disclosure of Insider trading decrease the Information Asymmetry among Investors in US capital market?

To answer this question ten sub-questions are formulated with 2 hypotheses. The sub questions are answered in the different chapters. Firstly, background information, the role of SEC and the requirements of the new regulation was discussed. Thereafter a brief description has been provided about the important and different types of disclosure. Next, theories' that is explaining information asymmetry and the relationship between information asymmetry and regulation disclosure and insider trading was discussed. Subsequently, the hypothesis was developed to whether SECRFD has an impact on the information asymmetry. The following hypothesis was developed:

(H₀): SEC Regulation Fair Disclosure adoption reduces information asymmetry in the capital market.

(H₁): SEC Regulation Fair Disclosure adoption increases information asymmetry in the capital market.

SPSS output has been used to test the hypothesis and answer the research question. Finally, to do the analyses, a final sample of 76 US listed companies which are reporting to SEC with Form 4 from the period September 1999 to December 2001 was used. Regression results have been compared before and after the adoption of SEC RFD. The results of the analysis show that there is a negative significant correlation between spread and SEC RFD. Furthermore, the output also shows that the average spread declined after the adoption of the regulation. Finally a robustness check was done to identify which of the model is better and whether there are other factors which can affect the bid ask spread. The result of this test also supported H₀.

Bases on the empirical results the research question of this study can be confirmed. The result of this study is consistent with the expectation as mentioned in the introduction and with the results of prior researches Sunder (2002), Chiyachantana (2004), and Aleswarapu (2004) and McLaughlin (2008). Because the main findings show that the adoption of SEC RFD has an impact on the information asymmetry which supported H₀. In contrast, according to Straser (2002), companies were disclosing information of less quality to investor only to meet regulation requirements and that more precise disclosure may lead to increasing of information asymmetry Gow et al. (2011). Eleswarapu et al, (2004) established that after the adoption the information flow remain unchanged.

8.3 Limitations and recommendations for further research

This thesis suffers from some limitations. First, the sample period use in this study before and after the adoption was short to measure the effect of SEC RFD. Secondly, this thesis only focus on manufacturing US companies with a share outstanding greater than ten thousand. Therefore, the result cannot be generalized to other setting. Finally, the pre adoption period is included in the test which cannot confirm the effect of the adoption during this period and may cause sample selection bias. For further research other measurements for SEC RFD should be used to test the

impact of the regulation information asymmetry using a larger sample and longer sample period. Secondly, this study only applies to US firms, but it would be interesting to do the same study for countries with similar regulations to see how that affects the results. Finally, SEC RFD focuses only on protecting the investors from misleading by insiders. Researches should be done on the impact of SEC RFD focusing on other stakeholders and other or new disclosure channels.

Appendices

Appendix 1: Summary table prior researches

| Year | Authors | Object of the study | Sample | Methodology | Results |
|------|----------------------|---|--|---------------------------|---|
| 1984 | <i>Elliot et al.</i> | Whether distributional characteristics are altered surrounding certain public announcements. | All private and open market insider trading purchases and sales from 1975-1979 | Multivariate test | The results indicate that the direction of insider trading is generally consistent with insiders' using private information in a profitable manner. |
| 2008 | McLaughlin et al. | Examined the role of regulation in reducing information asymmetries between firm insiders and outside investors | US SEO issuers from January 1985-December 2004. | Matched pair | The outcome of his study showed that firms where regulation can have greatest effect have greatest information asymmetry such as small firms. |
| 2005 | <i>Chae J.</i> | Investigates the behavior of market maker of trading volume before scheduled and unscheduled corporate announcements. | 65,912 earnings announcement of NYSE and AMEX companies from 1986 to 2000 | Cross-sectional analysis | Market makers act appropriately by increasing price sensitivity before all announcements, including unscheduled announcements. |
| 2014 | <i>Wei Wu</i> | Investigate the impact of information asymmetry on insider trading | 43 brokerage firms closing their research departments between 2000 and 2008. | Quasi experimental design | Corporate insiders obtain significantly higher abnormal returns and enjoy larger abnormal profits after the terminations of analyst coverage |
| 2014 | <i>Kaft et al</i> | Investigate whether senior officers use accrual-based earnings management to meet voluntary earnings disclosure | They collected forecasts of quarterly earnings from 1996–2010 | logistic regression | Senior officers' exclusive sales are negatively associated with future returns, because senior officers are more |

| | | | | | |
|------|----------------------|--|---|---|--|
| | | before selling or buying their own shares when they have private information. | | | likely to meet their earnings forecasts when they plan to sell stocks. |
| 2000 | <i>ABOODY et al</i> | Examine insiders' gain from trade focusing on a specific source of information asymmetry in firms' with R&D activities | all purchase and sale transactions made by insiders and reported to the SEC from January 1985 through December 1997 | Univariate test | Insider gains in R&D-intensive companies are significantly larger than insider gains in firms not engaged in R&D activities |
| 1986 | BAMBER | Examined the relations between the volume of securities traded, the magnitude of "surprises" in annual earnings announcements, and firm size. | 1,200 annual earnings announcements by 397 NYSE, AMEX and OTC firms from 1977 to 1979. | Spearman correlation rank | The study highlights that both magnitude of unexpected earnings and firm size were associated with the information content of annual earnings announcements. |
| 2007 | <i>Durnev et al.</i> | Whether insider trading laws protecting uninformed investors from private information-based trading. | Sample of 2,980 firms from 9 East Asian countries and 5,232 firms from 13 Western European countries. | Multivariate regressions | Countries with stricter insider trading laws score lower on corporate governance, disclose less and have more opaque earnings |
| 2004 | Chiyachantana et al. | Examines the impact of Regulation Fair Disclosure (FD) on liquidity, information asymmetry, and institutional and retail investors trading behavior. | 1,125 firms with an average of about three earnings announcements, defined in pre and post FD period | Event study | They found that Regulation Fair Disclosure have been effective improving liquidity and decreasing the level of information asymmetry |
| 2002 | Straser | This paper investigates whether the regulation induced companies to commit to higher or lower levels of voluntary disclosures by studying the changes in information asymmetry | 130 randomly selected S&P 500 stocks listed on the NYSE. for the period between July 18, 2000 and January 31, 2001 | Survey, simple pooled correlations, Wilcoxon matched-pairs signed-ranks test. | They found a significant increase in both information asymmetry and the probability of new information events that contain private information after the implementation of Regulation FD and a decrease in the proportion of informed traders. |
| 2004 | Eleswarapu et | Investigated the | All NYSE- listed | Event study | The results of this |

| | | | | | |
|------|--------|--|--|------------------|--|
| | al | impact of Regulation Fair Disclosure on total information flow and the changes of the amount of asymmetric information before and after the regulation | common stocks from january 2000- september 2000 and november 2000-may 2001. | | study showed a decrease in the level of information asymmetry after the introduction of Regulation Fair Disclosure. |
| 2002 | Sunder | Investigated the impact of the SEC Regulation Fair disclosure on information asymmetry | Days and times conference call by CCBN from the period march 1999- july 2001 | Univariate tests | Selective disclosure leads to high levels of information asymmetry and implementation of SEC Regulation Fair disclosure may help removed the difference between information asymmetry among investors. |

Appendix 2: Test of normal distribution Spread and descriptive statistic

Tests of Normality

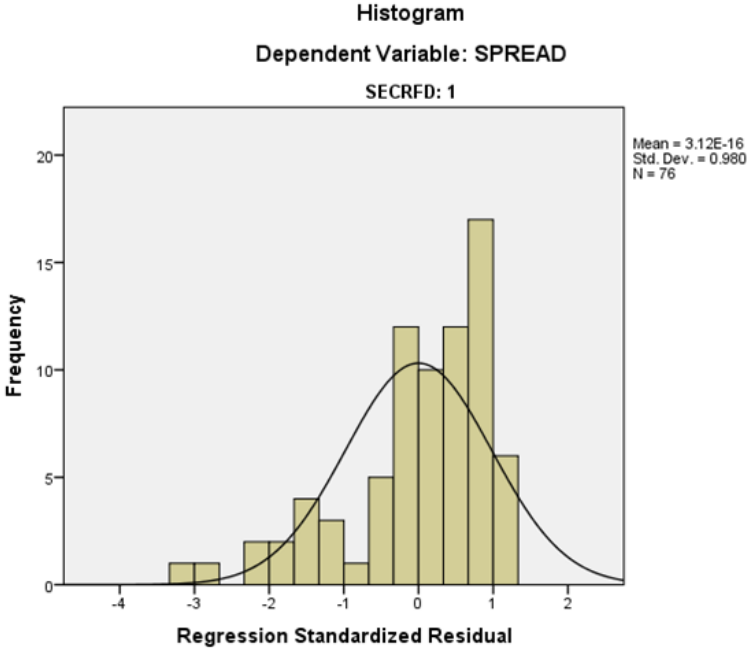
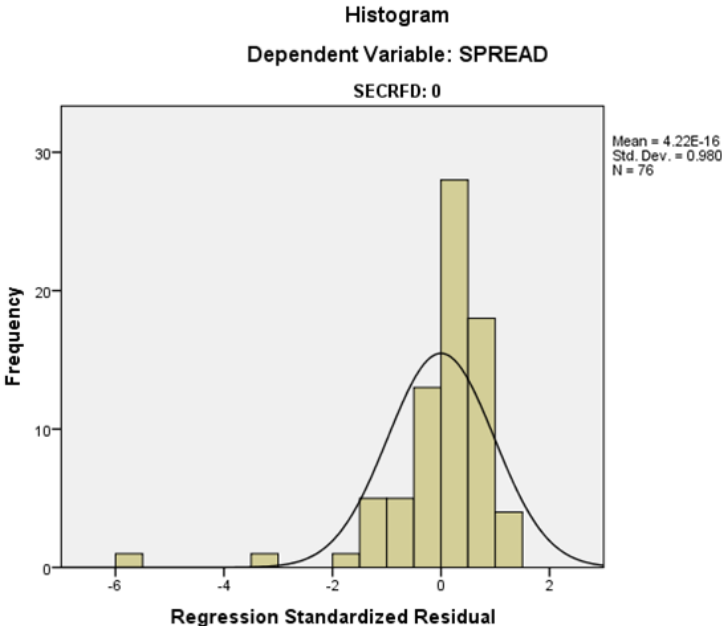
| | SECRFD | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|----------|--------|---------------------------------|----|------|--------------|----|------|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| SPREAD 0 | | .211 | 76 | .000 | .664 | 76 | .000 |
| 1 | | .183 | 76 | .000 | .848 | 76 | .000 |

a. Lilliefors Significance Correction

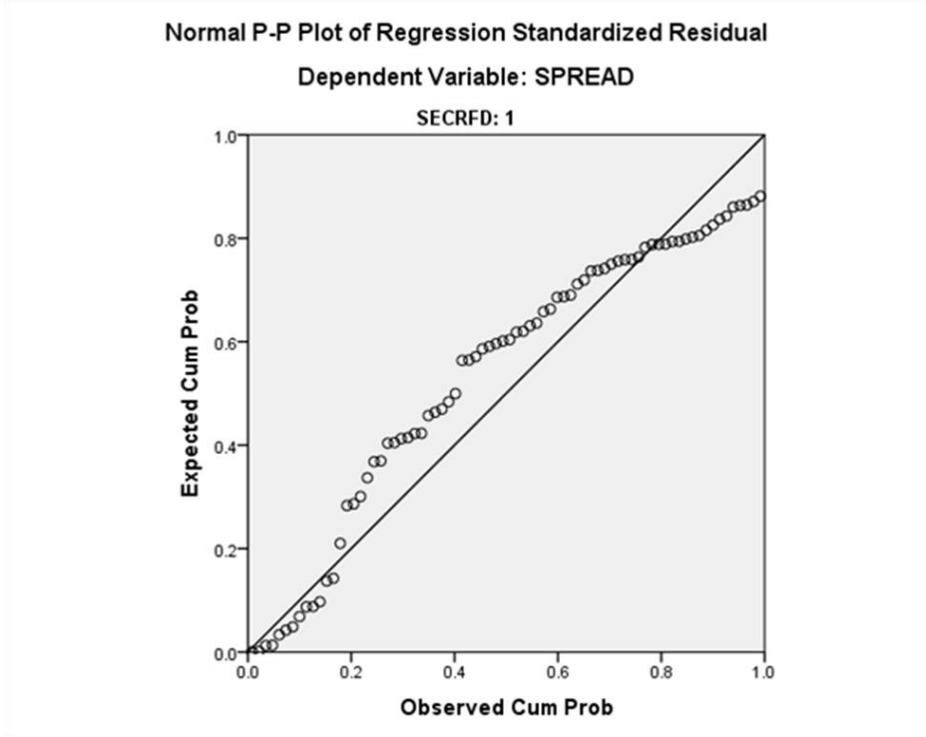
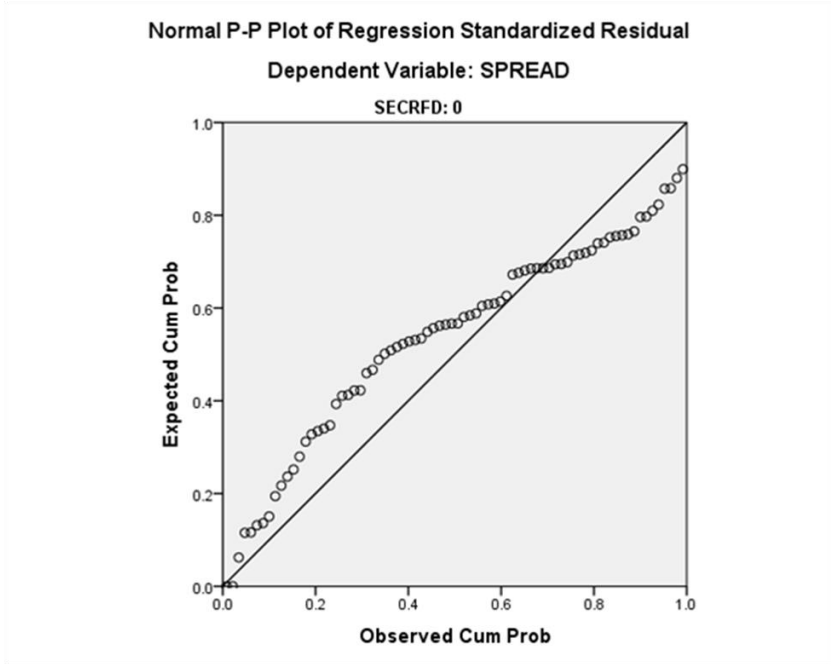
Descriptives

| | SECRFD | Statistic | Std. Error |
|----------|--|------------------|------------------|
| SPREAD 0 | Mean | -.00715474493372 | .000949803301168 |
| | 95% Confidence Interval for Mean Lower Bound | -.00904685013586 | |
| | Upper Bound | -.00526263973158 | |
| | 5% Trimmed Mean | -.00600009944978 | |
| | Median | -.00481979536966 | |
| | Variance | .000 | |
| | Std. Deviation | .008280193212069 | |
| | Minimum | -.057042686576 | |
| | Maximum | -.000504533201 | |
| | Range | .056538153375 | |
| | Interquartile Range | .008364340187 | |
| | Skewness | -3.573 | .276 |
| | Kurtosis | 17.966 | .545 |
| 1 | Mean | -.00886427477585 | .000882763356025 |
| | 95% Confidence Interval for Mean Lower Bound | -.01062282955886 | |
| | Upper Bound | -.00710571999284 | |
| | 5% Trimmed Mean | -.00813914057474 | |
| | Median | -.00738124570294 | |
| | Variance | .000 | |
| | Std. Deviation | .007695752519946 | |
| | Minimum | -.032869886374 | |
| | Maximum | -.000597257850 | |
| | Range | .032272628524 | |
| | Interquartile Range | .008771429775 | |
| | Skewness | -1.460 | .276 |
| | Kurtosis | 1.831 | .545 |

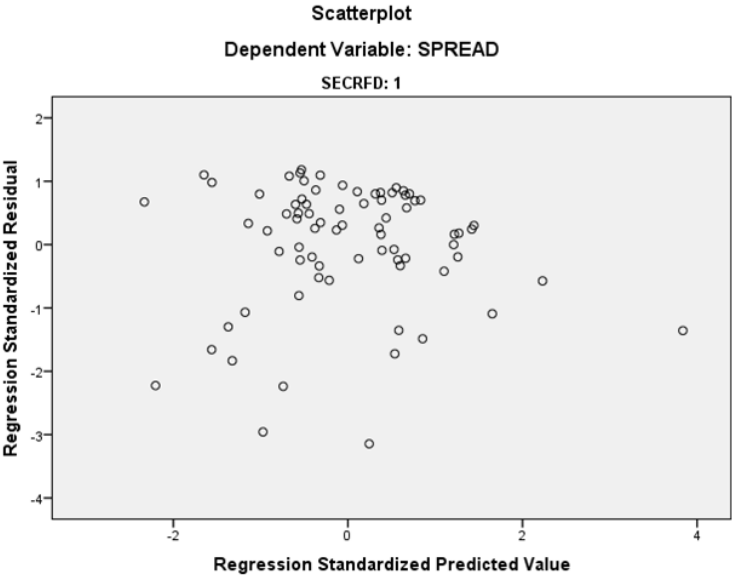
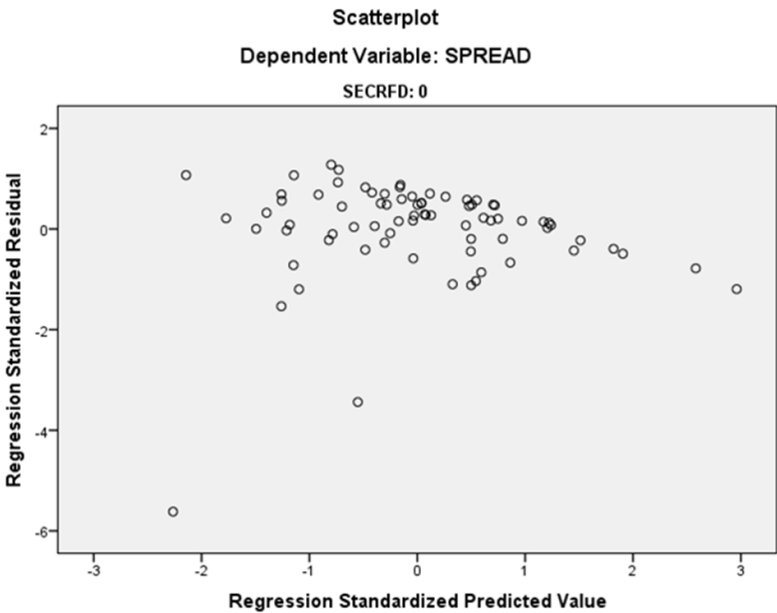
Appendix 3: Histogram before winsorizing



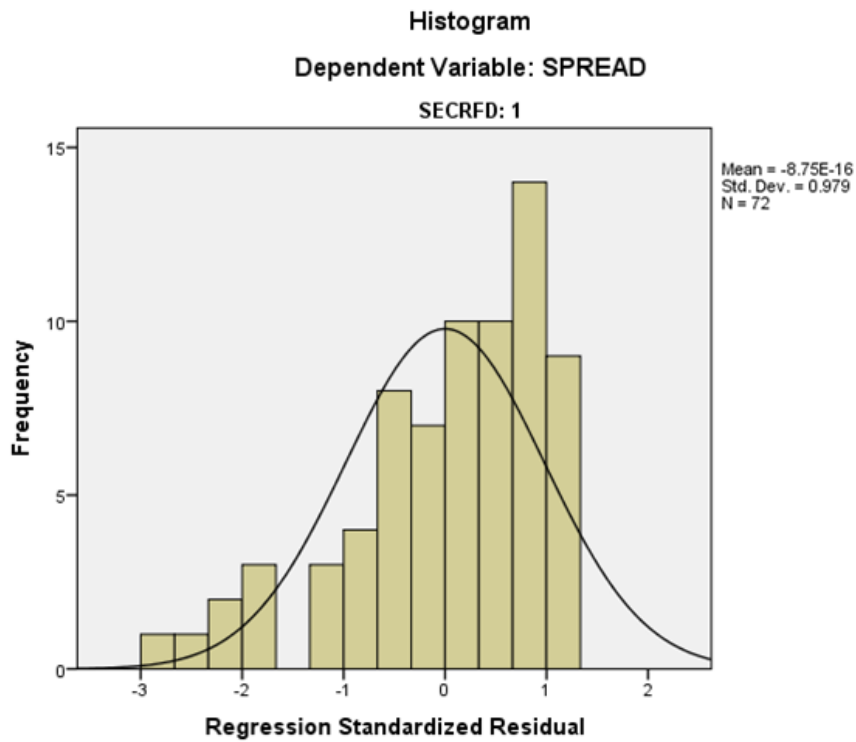
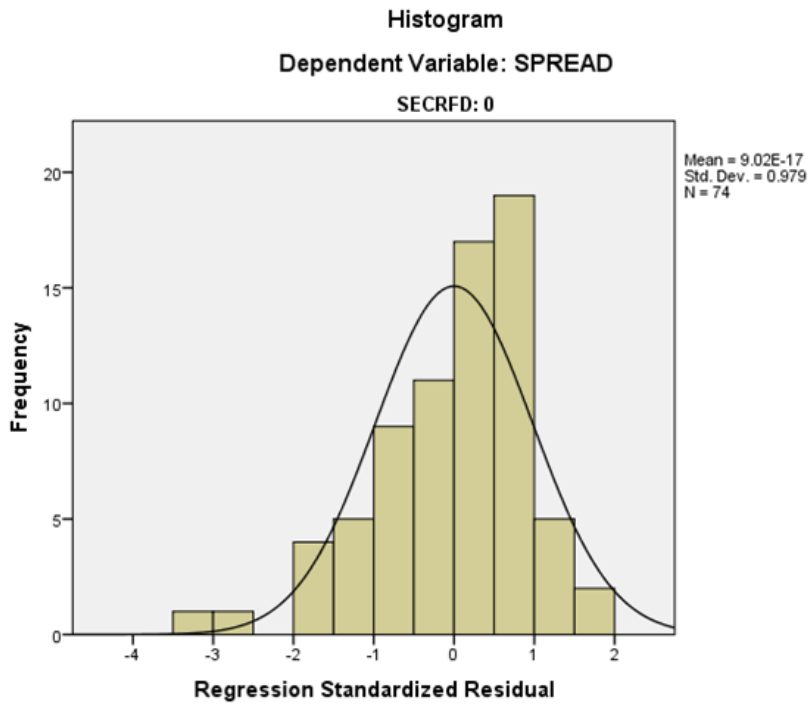
Appendix 4: P-P plot before winsorizing



Appendix 5: Scatterplot before winsorizing

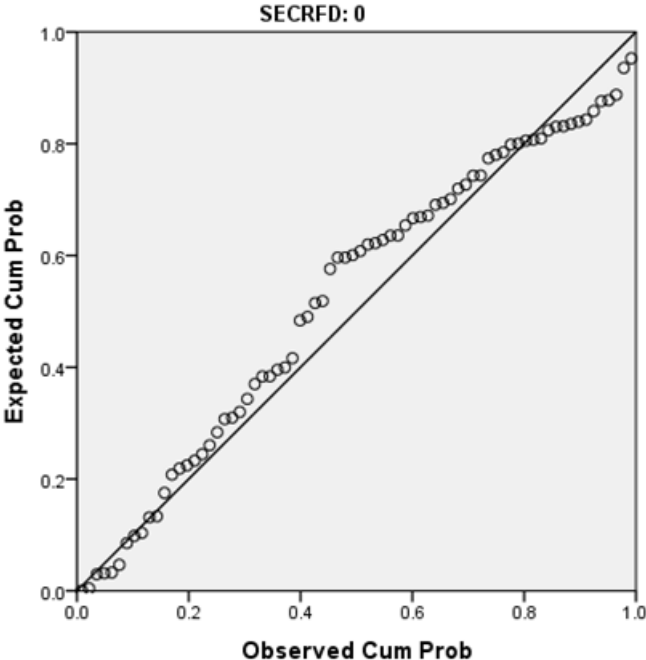


Appendix 6: Histogram after winsorizing

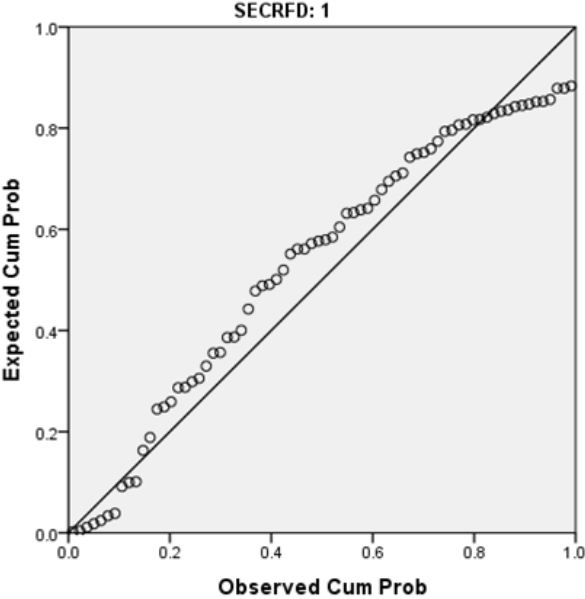


Appendix 7: P- P plot after winsorizing

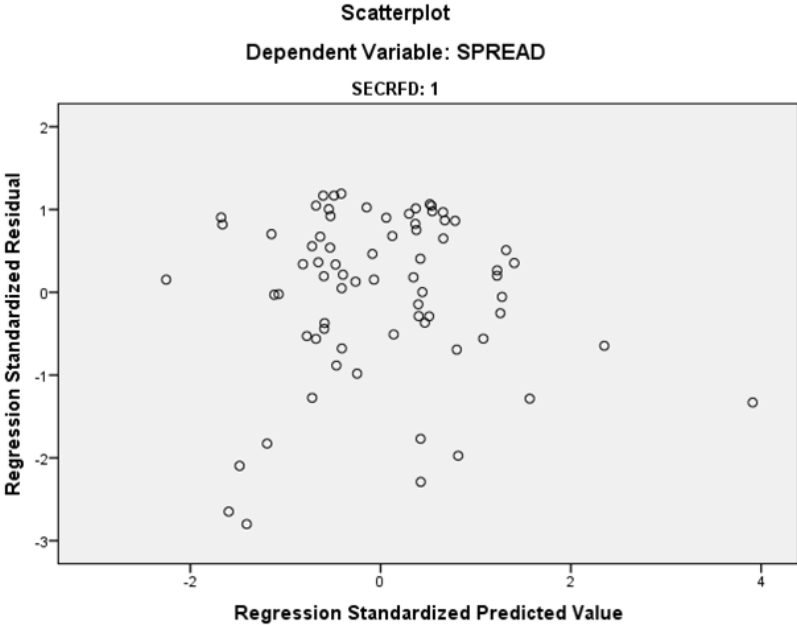
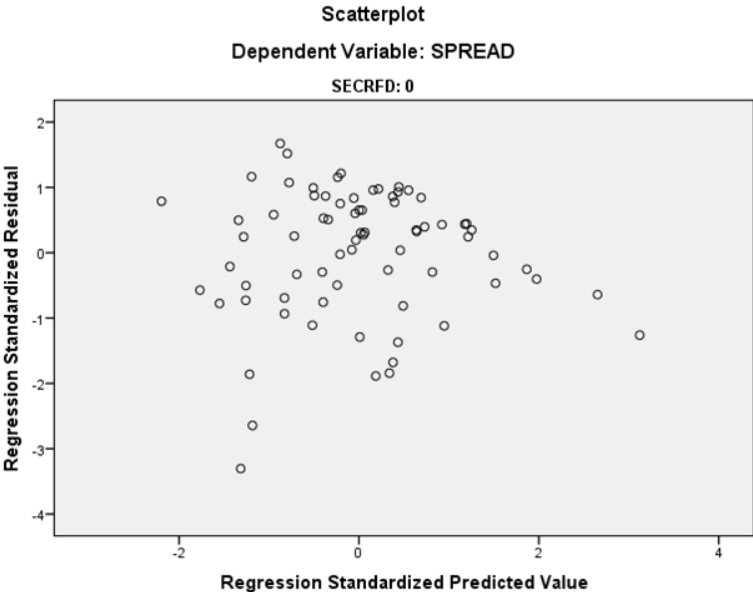
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



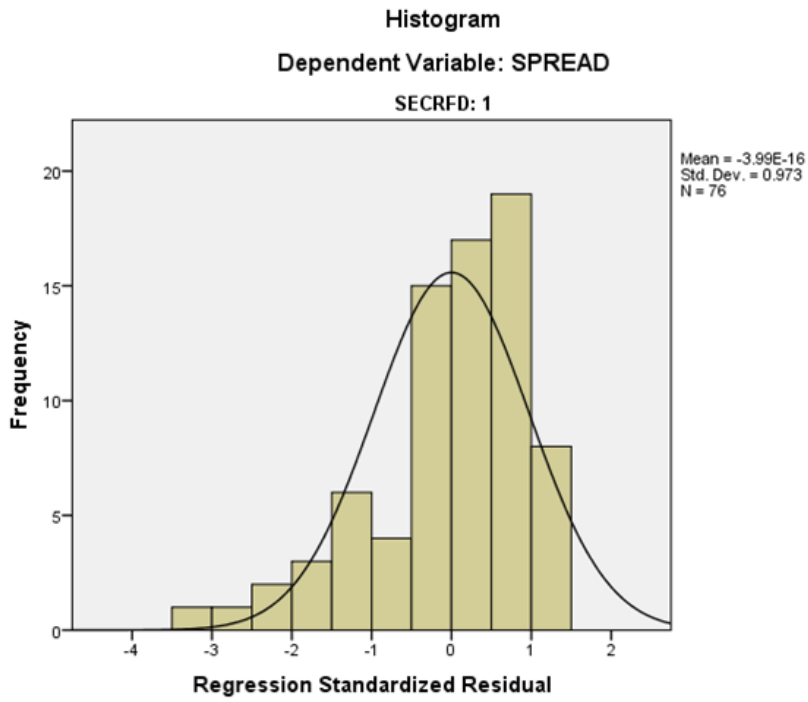
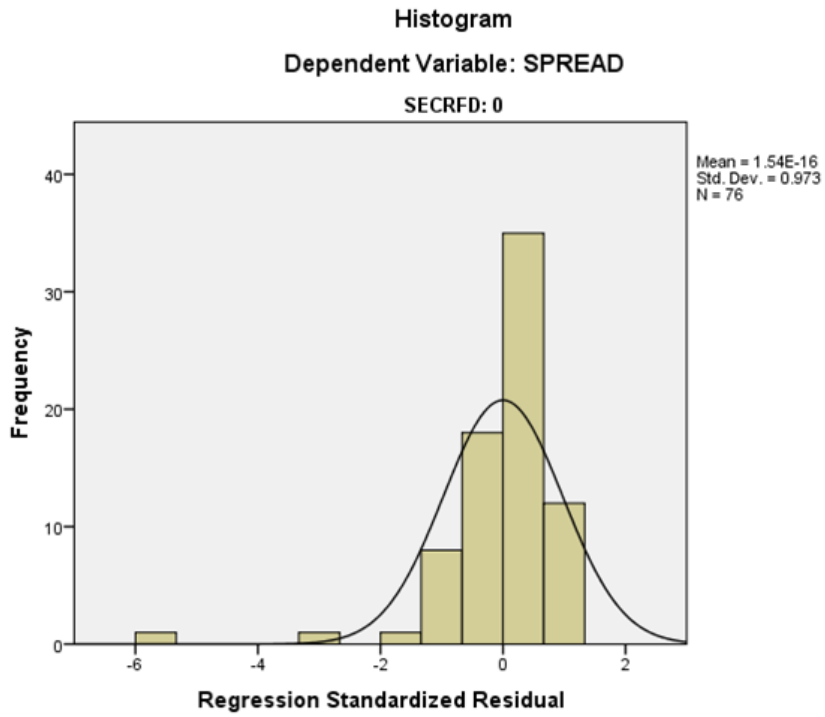
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



Appendix 8: Scatterplot after winsorizing

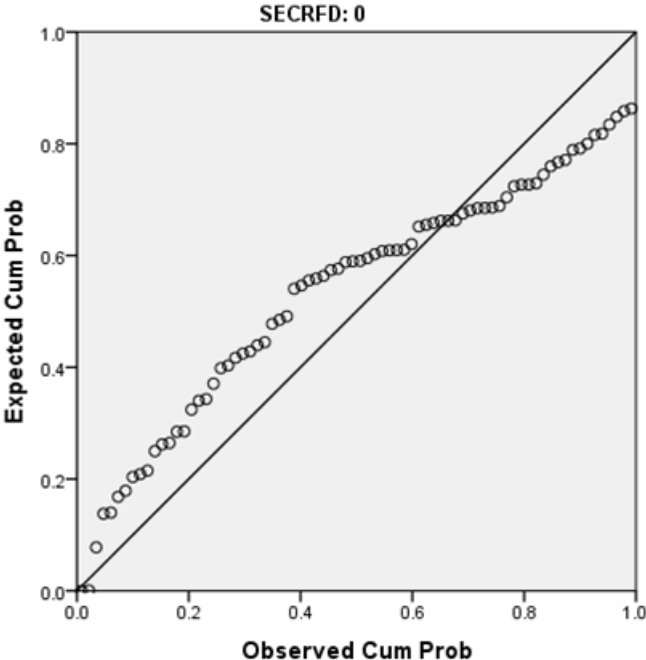


Appendix 9: Histogram after robustness check and before winsorizing

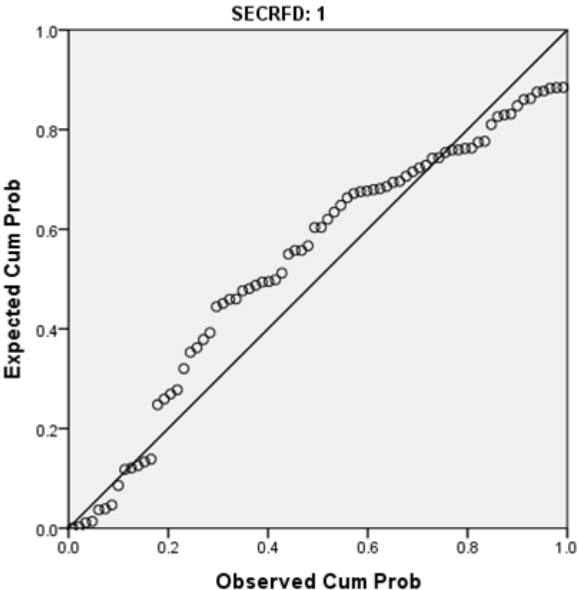


Appendix 10: P-P plot after robustness check

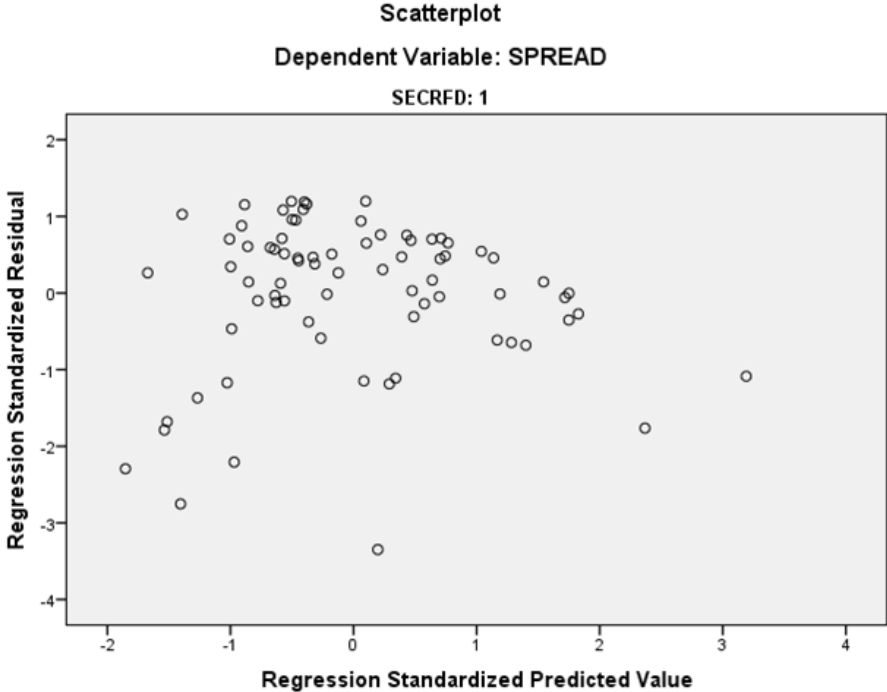
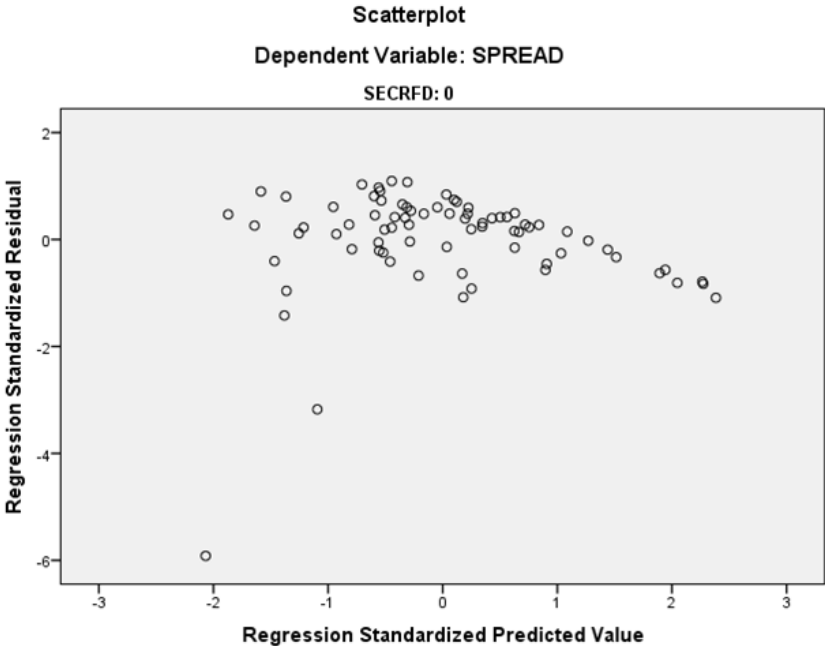
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



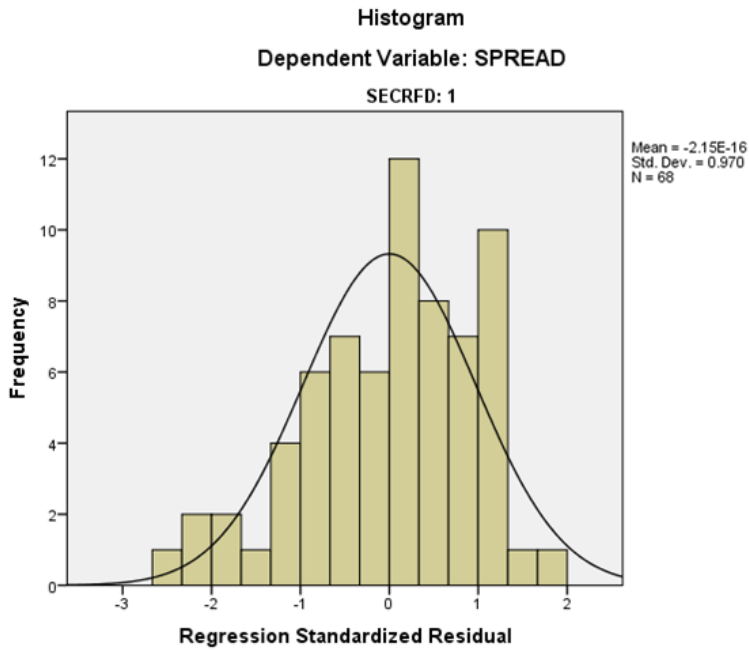
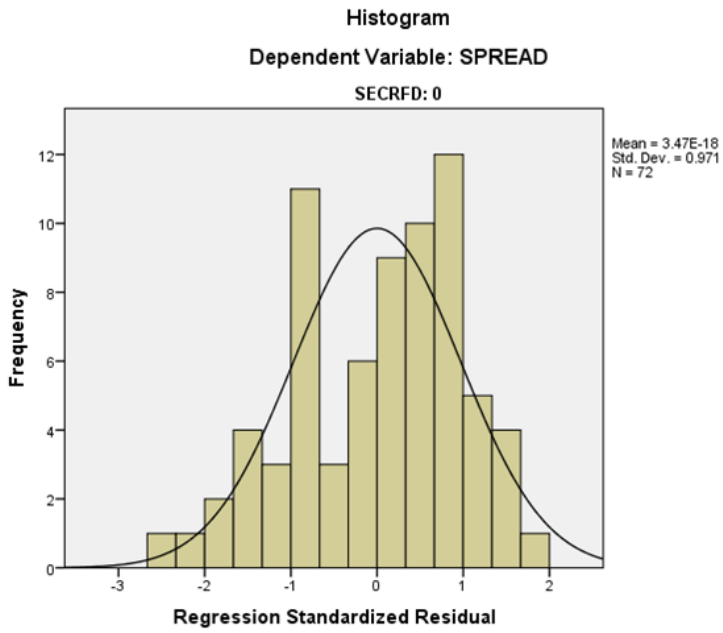
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



Appendix 11: Scatterplot after Robustness check

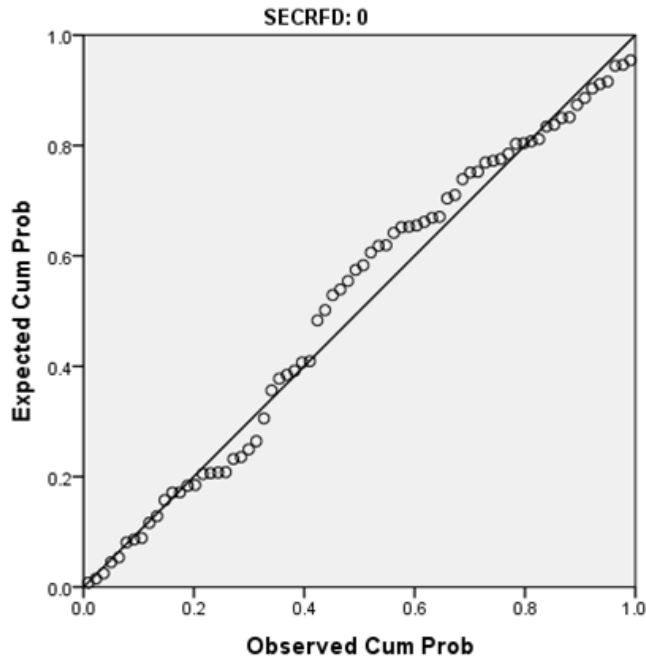


Appendix 12: Histogram after robustness check and after winsorizing

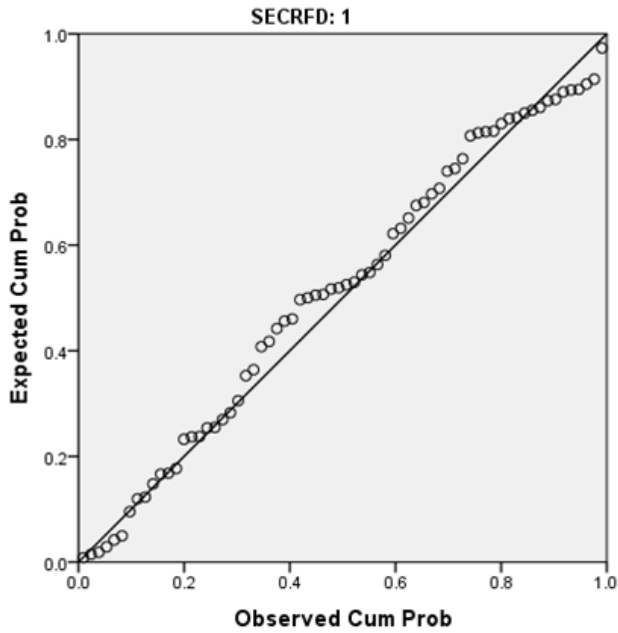


Appendix 13: P-P plot after robustness check and after winsorizing

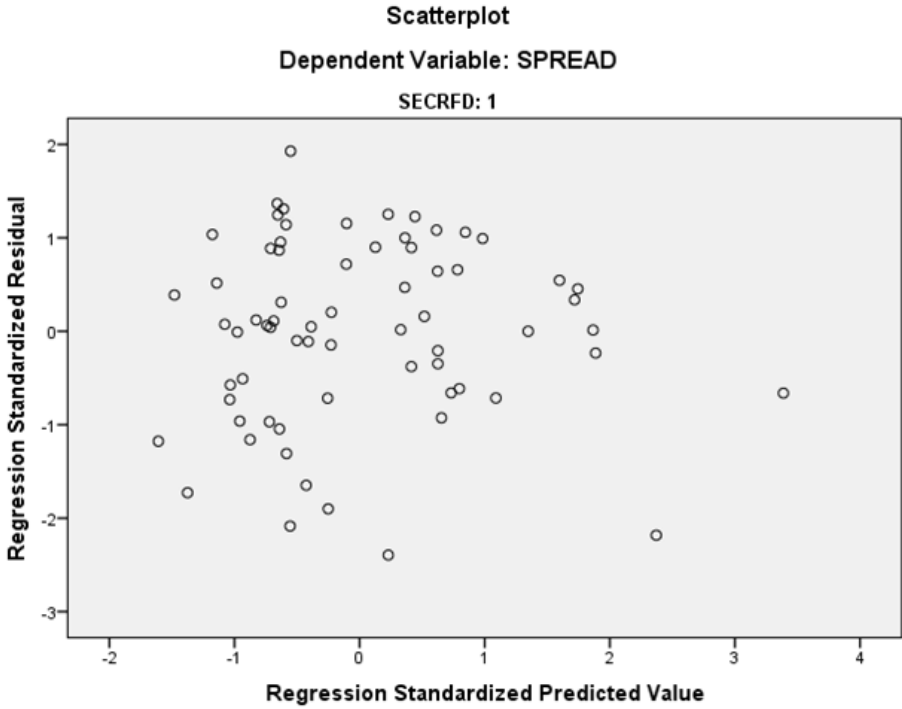
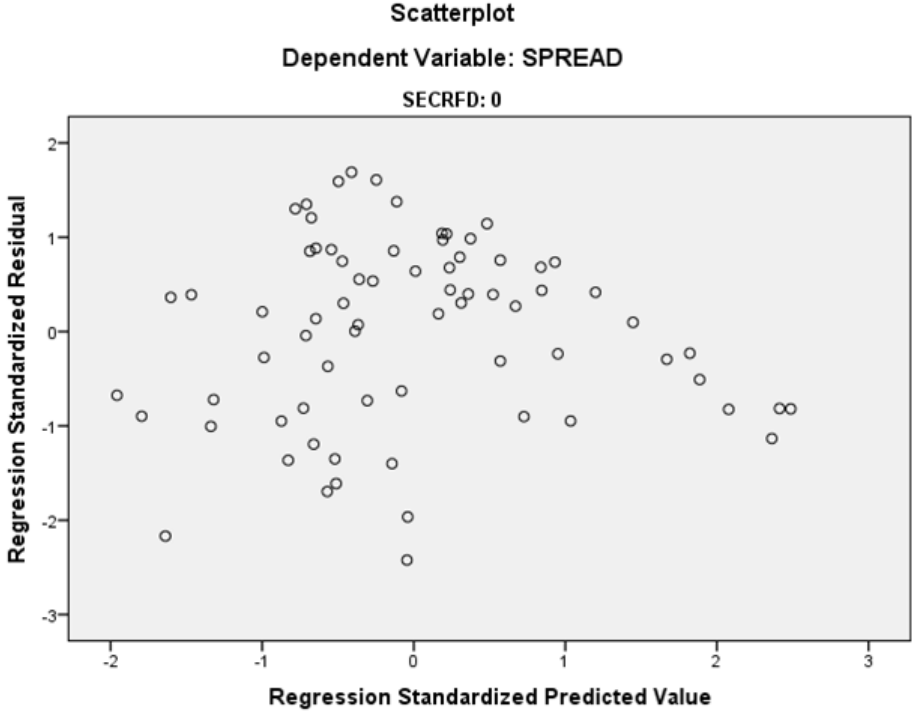
Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: SPREAD



Appendix 14: Scatterplot after robustness check and winsorizing



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