# THE IMPACT OF CREDIT RATING CHANGES ON STOCK AND CORPORATE BOND PRICES: EVIDENCE FROM THAI CAPITAL MARKETS

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A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science Program in Finance

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Field of Study           Finance

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สุดารัตน์ ปังสุวรรณ : ผลกระทบของการเปลี่ยนแปลงการจัดอันดับความน่าเชื่อถือหุ้นกู้ต่อราคาหุ้นและหุ้นกู้ : หลักฐานเชิงประจักษ์จากตลาดทุนไทย (The impact of credit rating changes on stock and corporate bond prices: Evidence from Thai capital markets) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : ผศ.ดร.อนิรุต พิเสฏฐศลาศัย, 83 หน้า.

งานวิทยานิพนธ์ฉบับนี้ศึกษาผลกระทบของการเปลี่ยนแปลงการจัดอันดับความน่าเชื่อถือของหุ้นกู้ต่อราคาหุ้น ตั้งแต่ปี 1996 ถึง 2012 และผลกระทบต่อราคาหุ้นกู้ ตั้งแต่ปี 2549 ถึง 2555 ซึ่งประกาศเปลี่ยนโดยทริสเรทติ้ง, ฟิทช์ เรทติ้งส์ (ไทยแลนด์), มูดี้ส์ และเอสแอนด์พี ผลที่ได้พบว่าการเปลี่ยนแปลงอันดับความน่าเชื่อถือของหุ้นกู้ให้ข้อมูลใหม่และมีคุณค่าแก่นักลงทุนหุ้นและหุ้นกู้ ซึ่งพบว่ามีผลตอบแทนที่ผิดปกติอย่างมีนัยสำคัญในเชิงบวกในช่วงปรับเพิ่มอันดับความน่าเชื่อถือของหุ้นกู้ และพบผลตอบแทนที่ผิดปกติอย่างมีนัยสำคัญในเชิงลบในช่วงปรับลดอันดับความน่าเชื่อถือของหุ้นกู้ นอกจากนี้ผลศึกษาพบว่า ในช่วงเปลี่ยนแปลงอันดับความน่าเชื่อถือของหุ้นกู้ ราคาหุ้นกู้มีการตอบสนองต่อการเปลี่ยนแปลงอันดับความน่าเชื่อถืออย่างมีนัยสำคัญมากกว่าและขนาดใหญ่กว่าราคาหุ้น หุ้นกู้ใช้ระยะเวลานานกว่าหุ้นในการดูดซับข่าวการเปลี่ยนแปลงการจัดอันดับความน่าเชื่อถือของหุ้นกู้และการปรับราคากลับสู่ปกติ ซึ่งนำไปสู่ผลตอบแทนที่ผิดปกติอย่างมีนัยสำคัญในช่วงเวลาหลังวันประกาศ นอกจากนี้ผลที่ได้ชี้ให้เห็นว่าอุตสาหกรรมของบริษัท และหน่วยงานที่จัดอันดับความน่าเชื่อถือเป็นปัจจัยที่มีอิทธิพลต่อผลตอบแทนที่ผิดปกติอย่างแตกต่างกันในระหว่างการประกาศการเปลี่ยนแปลงอันดับความน่าเชื่อถือของหุ้นกู้ โดยบริษัทหรือสถาบันทางการเงินมีอิทธิพลมากกว่าบริษัทที่ไม่ใช่สถาบันการเงิน และสถาบันจัดอันดับทั่วโลก อย่างมูดี้ส์และเอสแอนด์พี มีอิทธิพลมากกว่าสถาบันจัดอันดับในประเทศ (ทริสเรทติ้งและฟิทช์เรทติ้งคะแนน)

ภาควิชา : <u>การธนาคารและการเงิน</u>    ลายมือชื่อนิสิต.......................................................

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Sudarat Pangsuwan : The impact of credit rating changes on stock and corporate bonds : Evidence from Thai capital markets. Advisor : Asst. Prof. Anirut Pisedtasalasai, Ph.D., 83 pp.


This thesis examines the impact of credit rating changes on stock prices during 1996 – 2012 and on corporate bond prices during 2006 – 2012, which rating changes are announced by TRIS rating, Fitch rating (Thailand), Moody's and S&P. The results suggest that credit rating changes provide new and valuable information to stock and corporate bond market participants. There are significant positive (negative) abnormal returns during rating upgrade (downgrade) announcements for both stock and corporate bond markets. The results report that corporate bond prices significantly react to rating changes stronger and larger than stock prices. Corporate bonds take longer time than stocks in absorbing the rating change news and adjusting its prices after the announcement, which lead to significant abnormal returns for many days after announcement date. Moreover, the results suggest that firm industries and credit rating agencies are factors that influence different abnormal returns during rating change announcements. Financial firms are more influential than non-financial firms; and global rating agencies (Moody's and S&P) are more influential than local rating agencies (TRIS and Fitch rating).

Department :      Banking and Finance      Student's Signature

Field of Study :    Finance                        Advisor's Signature

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**CHAPTER I**

**INTRODUCTION**

**1.1. Background and Problem Review**

Credit rating is a major source of financial information about the quality of a particular debt issue and a firm's ability to pay back debts. Credit rating is determined by rating agencies and used in asset pricing, risk management and portfolio management (Koresh and Gil, 2011). Rating agencies are responsible to assign the beginning ratings to new bond issuances by looking at the fundamental and the solvency of the issuing firms. They evaluate the firms from available public information (i.e. financial statements) and private information (i.e. budget forecasts, inside reports, investment strategies, qualitative assessment of management, firm prospects and firm's position). The rating also depends on the factors that related to the firms, industries, and macroeconomic environment[1]. As time passes by and these factors changed, rating agencies will re-evaluate and change the ratings of firm and its issued bonds. Rating agencies are responsible to provide opinions about the creditworthiness of bonds and the issuers to financial markets (stock and bond markets).

The informative issue of these credit rating changes has been debated and studied for many years across different markets and countries. All researches use the event study method to investigate the impact of credit rating announcements on security prices, as well as, to test the market reaction, market efficiency and private information. Most researches mainly focus on the stock market's abnormal returns

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[1] See more detail from an analysis of Mood's and Standard and Poor's rating systems.

such as Griffin and Sanvicente (1982); Holthausen and Leftwich (1986); Glascock et al. (1987); Hand et al. (1992); Followill and Martell (1997); Dichev and Piotroski (2001), etc. These studies examined abnormal stock returns by using different daily and monthly data. Some of these studies found significant abnormal returns to both rating upgrades and downgrades, whereas some studies found only significant negative abnormal returns during rating downgrades.

There are also researches studied this issue on bond market, but in a smaller numbers compared to the studies of this issue on stock markets, for example, Hand et al. (1992); Katz (1974); Grier and Katz, (1976); Wansley and Dhillon (1989); Hite and Warga (1997); Steiner and Heinke (2001), etc. These studies of the impact of credit rating announcements on corporate bond markets found that there are significantly negative abnormal bond returns during rating downgrades. However, the studies of the impact of credit rating announcements on bond market have still been focused by many researchers. The recent study on bond market was constructed by May (2010), providing the evidence of abnormal bond returns by comparing daily and monthly data. He found the significant negative abnormal returns to rating downgrades and positive abnormal returns to rating upgrades. Though, the reaction to the upgrades is economically small. He also found that the daily data provides more powerful evidence than the monthly data.

Although most of empirical studied about the impact of credit rating change announcements on stock and bond prices have been focused on US market which mentioned above, there are many studies examining the impact of rating changes on non-US markets. Barron et al. (1997) found that the abnormal stock returns are

significant to rating downgrades in UK market. Also, Choy et al. (2006) found the significant abnormal stock returns to rating downgrades in Australian stock market. While, Elayan et al. (2003) found that New Zealand stock market reacts significantly to both upgrades and downgrades. Creighton et al. (2007) extended Choy et al. (2006)'s study and found the significant on stock and bond price reactions during both rating upgrades and downgrades.

For Thai market, all empirical studies of this field have mainly focused on the stock prices. None of the studies are concentrated on bond prices. Vaithanomsat (2001), Piyakulvorawat (2003), Veeravongchairoj (2007) and Archapairoj (2008) examined the effect of the credit rating changes on stock prices by using different applications of model, different samples, different credit rating agencies and different controlled information. They all found significantly positive abnormal returns to upgrades and negative abnormal returns to downgrades.

From previous empirical studies, the results on US market are different from non-US market. Steiner and Heinke (2001) suggested that the nationality of issuers is one of factors that can influence the price movement after rating downgrades. Credit rating of bonds on US market is more informative than non-US markets. In addition, Elayan et al. (2003) suggested that the differences between small and big markets come from different limited availability of information, relative attention or neglect and liquidity premium. Different reaction between small and large markets can

indicate that credit ratings give high importance and value to participants in small market[2].

According to different evidences of this issue across countries and markets, this paper aims to provide evidences about the impact of credit rating changes on stock and corporate bond prices to Thai capital markets. This thesis investigates the impact of credit rating changes on stock prices and sheds further light this issue on Thai corporate bond market which has not been examined yet. This paper provides more evidence of corporate bond prices since there are few literatures studying on it, only in US, Eurobond and Australia. Moreover, this paper does not examine only the market reaction of stock and corporate bond prices during rating changes like previous studies have done, but also investigate the speed of price adjustment which can also explain the market efficiency. Stock and corporate bond prices will be relatively compared during the same period, rating change announcements and firms.

In addition, this paper investigates two factors that can influence significant abnormal returns during rating change announcements: issuer's industries and credit rating agencies. This paper investigates whether the impact of credit rating changes to financial and non-financial firms will be different, relative to the issuer hypothesis. Lastly, this paper examines the relative influence between two groups of credit rating agencies, global and local credit rating agencies, whether which group influences stronger significant abnormal returns.

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[2] Elayan, F., Hsu, W., Meyer, T., 2003. *The informational content of credit rating announcements for share prices in a small market*. Journal of economics and finance, Vol.27, No.3, 337-356

**1.2. Research Questions**

1) Are there any significantly positive (negative) abnormal returns for stocks and corporate bonds during rating upgrade (downgrade) announcements?

2) What are the differences of market reactions and the speed of price adjustment between stock and corporate bond prices, relative to the same study period, rating change announcements and firms?

3) Are there strongly different price reactions among financial firms and non-financial firms, under the issuer hypothesis?

4) Do global or local rating agencies relatively influence the stronger impact of credit rating changes on stock prices during rating change announcements?

**1.3. Objectives**

Corporate bond ratings announced by credit rating agencies are important to market participants and firms since they provide information about the creditworthiness and quality of firms and their issued bonds. As a result, the credit rating change announcements should be carefully evaluated by rating agencies to convey valuable information to market participants. The overall objective of this paper is to investigate whether credit rating changes contain any pricing relevant information, and this objective is divided into 4 specific aims.

The first aim is to re-examine the impact of credit rating changes on stock prices during January 1996 – April 2012 with the longer period and larger sample compared to the previous studies in Thai stock market. Moreover, my paper aims to provide the new evidence to Thai corporate bond market by examining the impact of

credit rating changes on corporate bond prices during July 2006 – April 2012. These two financial markets are examined to study whether there are any significant abnormal returns during rating change announcements or credit rating changes contain pricing relevant information. The second aim is to compare the market reactions and the speed of price adjustment between stock and corporate bond prices during July 2006 – April 2012 with the same rating change announcements and firms. Since stocks and corporate bonds are different about frequency of trades and market liquidity, the market reactions and the speed of price adjustment are expected to be different between stocks and corporate bonds.

The third and fourth aims are to investigate the possible factors that may influence the abnormal returns during rating change announcements on stock and corporate bond markets. The third aim is to examine the impact of credit rating changes for financial firms and non-financial firms to see which one leads to the significantly stronger reactions when credit ratings are changed. Lastly, the fourth aim is to examine the relative influence between two groups of credit rating agencies (global and local credit rating agencies) to credit rating changes whether which group of credit rating agencies significantly influence stronger abnormal returns during credit rating change announcements.

In conclusion, this paper will be useful to stock and corporate bond investors to understand how stock and corporate bond prices respond to the credit rating changes, so that they can decide their strategy effectively and invest more carefully. Information is the key factor for this event study since the markets respond to the rating changes when they receive new information.

**1.4. Research Hypotheses**

According to background and problem review, there are different evidences of price reactions to credit rating changes across countries (U.S, U.K., Australia, Spain, Japan, etc.) and financial markets (U.S. and non-U.S markets; or developed, developing and emerging markets). For Thailand, I hypothesize that there are significant positive abnormal returns during rating upgrades and negative abnormal returns during rating downgrades for both stock and corporate bond markets. As credit rating agencies are responsible to evaluate the firms' creditworthiness and their ability to pay back debts or future obligations, they can access both public and private information such as budget forecasts, inside reports, investment strategies, firm prospects, and etc. Therefore, rating change announcement can convey some valuable information to financial markets. Investors will perceive rating upgrades as good news and rating downgrade as bad news since these rating changes represent the firm's financial position, its default risk and its future financial indicator.

When stock and corporate bond prices are compared with the same study period, credit rating change announcements and firms, I expect corporate bond prices react stronger to credit rating changes than stock prices since it represents directly about the issuing bonds' credit worthiness and their firms' ability to pay back debts. Moreover, corporate bond prices are expected to take longer times than stock prices in absorbing the credit rating change news and adjusting the prices since corporate bonds are not frequently traded and high liquidity compared to stocks.

Moreover, the impact of credit rating changes of financial firms is expected to be significantly stronger than non-financial firms especially when credit ratings are

downgraded. In Thailand, financial firms are higher regulated by many regulations and acts than non-financial firms. The issuer hypothesis suggests a stronger price movement during rating changes for highly regulated firms. In addition, financial institutions are important to either domestic or external economic sectors for a country. They confront with various risk and volatilities, which could affect other sectors in the economics. So, they have to maintain the financial system stability and stable economic growth. As a result, they cannot provide all bad news of their institutions to the public since it can affect their financial system stability. It is possible that financial institutions might hide some bad news or negative information to maintain depositors/customers/investors' confidence in their firms and retain their capability to attract more capital in the markets.

Lastly, I expect that global credit rating agencies (Moody's and S&P) are more influential to rating change announcements than local credit rating agencies due to their greater specialized skills in assessing credit worthiness of firms and experiences in credit rating industry.

## 1.5. Organization of the Paper

The remainder of this paper is organized as follows: Chapter 2 provides literature review about rating industry in Thailand and credit rating changes on stock and corporate bond markets. Chapter 3 presents data and methodologies. Chapter 4 provides results and discussion. Lastly, chapter 5 provides conclusion and area for future research.

**CHAPTER II**

**LITERATURE REVIEW**

Bond credit rating assigned by rating agencies indicates creditworthiness of the issuers and their ability to meet their future obligations. Many literatures have examined the impact of credit rating changes on stock and corporate bond prices across countries and markets. This chapter consists of three subsections. The first subsection provides the background about the credit rating industry in Thailand. The second subsection reviews three main hypotheses related to the valuable information of credit rating changes. The last subsection reviews the effects of credit rating change on stock and corporate bond prices either in the United States and other countries.

## 2.1. The Credit Rating Industry in Thailand

### 2.1.1. Credit Ratings

Before the firms can issue new bonds and sell them publicly, they have to obtain the permission from the Securities and Exchange Committee of Thailand or SEC by submitting the details of each issuance[3]. If the issuer is permitted, they have to issue their bonds within 3 years after that permission and follow the regulations of SEC. Also, the issuing bonds need to be rated by agencies that SEC approve, which are TRIS rating and Fitch Ratings (Thailand); and registered in the Thai Bond Market Association (ThaiBMA).

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[3] See more detail in Bond market and rating agencies in Thailand (Hidenobu, 2010)

In addition, credit ratings can be classified into two types, company rating and bond rating[4]. Company rating represents the whole company's financial position and its ability to pay back debt to their creditors. Mostly, company rating is used as an important indicator for financial institutions or creditors in credit approval to each company/debtor. The financial institutions or creditors will consider each debtor on their organizational structure, financial statements, ability to pay back debts and potential of default. However, company rating doesn't need to be rated as the same grade as its issuing bonds since company rating and bond rating will be rated separately.

In contrast, bond rating indicates financial strength of bond issuers and their ability to pay principal and interests of a particular bond during a given time period. Bond rating will be considered according to the conditions of any particular bond such as terms and conditions, the rights and benefits of bondholders, bond security/guarantee, and source of funds in order to meet future obligations. However, rating agencies also consider the company rating in bond rating, along with other factors such as organizational structure, financial/capital structure, profitability, market competitions, business potential, sufficiency of cash flow for debt payment and other risky factors.

Moreover, credit ratings can be divided into two grade classes, investment and speculative grade class. Investment grade is when the firms or bonds are rated by rating agencies at BBB or above. The investment grade represents the firms' good creditworthiness, great ability to pay back debts, and low default risk. In contrast, the

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[4] Creditworthiness and Corporate Bonds by Apinan Jansiriwanitch, Department of Research and Development, Thai Bond Market Association (ThaiBMA)

speculative grade class is firms or bonds that are rated by rating agencies at BB or below. This lower grade represents the firms' high default risk and may not be able to pay back debts or future obligations due to its financial problems. Most of Thai corporate bonds and firms are rated within the investment grade. However, there are few firms and its bonds rated in the speculative grade.

## 2.1.2. Rating Agencies[5]

In Thailand, TRIS rating Co., Limited and Fitch Ratings (Thailand) Limited are the only two local rating agencies that are approved by SEC to provide credit services. These two rating agencies are classified as Domestic Credit Rating Agency (DCRA).

TRIS rating is the first local rating agency in Thailand approving by SEC. TRIS rating firstly was established in 1993 by Financial Ministry and the Central Bank, named Thai Ratings and Information Services Co., Limited. TRIS rating assesses the performance of governmental institutions, public firms, private firms, financial institutions; and provides the company-rating and bond-rating service to them. Thai government holds major shares for 18.5% of TRIS. The remainder of shares is owned by the Stock Exchange of Thailand, commercial banks, securities companies, insurance companies and private sector.

Fitch Ratings (Thailand) Limited is the only international credit rating agency approved by SEC to assign national ratings in Thailand, apart from TRIS. Fitch Ratings (Thailand) was established in 2001 through the joint venture of Fitch (49.9%)

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[5] See more in Bond Market and Rating Agencies in Thailand by Hidenobu Okuda (Hidenobu, 2010) and Creditworthiness and Corporate Bonds, ThaiBMA

and major Thai institutional investor (50.1%) including Government Pension Fund. Fitch Ratings provides the company-rating and bond rating to financial institutions, corporate finance, structured finance, debt funds, and asset management services. The major shares are held by Fitch Ratings by 49%. The remainder of shares is owned by the governmental pension fund, Kasikorn Asset Management Co., Ltd., Thai Life Insurance Co., Ltd. and TISCO Asset Management Co., Ltd.

Moreover, there are also two global rating agencies, Moody's and S&P, providing rating services to many Thai firms. However, their ratings are not required by SEC for the new issuing bonds. Moody's and S&P are additional choices for firms if they prefer global credit rating with greater specialized skills and experiences, but paid in the higher fees compared to local credit rating agencies. Moody's and S&P are classified as International Credit Rating Agency (ICRA). They were established for more than one hundred years. Most of their revenues are obtained from sources in the United States, where their headquarters are located. Moody's and S&P are suppliers of credit information and risk analysis to worldwide investors in assessing the creditworthiness of firms and their fixed-income securities. In addition, Moody's and S&P have pursued a strategy of globalization in part to pick up a change of investing in local markets, especially in developing markets.

However, TRIS rating and Fitch Rating (Domestic Credit Rating Agency, DCRA) use different scale from Moody's and S&P (International Credit Rating Agency, ICRA). DCRA provides the company-rating and bond rating to the local firms by using national scale. DCRA considers the business and financial factors in evaluating creditworthiness of that firm and its bonds. DCRA analyzes a particular

firm's creditworthiness from its ability to pay debt within a specified period with the full amount of debts and compare it with other local related-industry firms or institutions. Moreover, DCRA will not consider about country factors such as economics, politics, investment and tax policies. Any country factor can be included if its change or policy significantly affects the firm's ability to pay back debt obligations.

In contrast, International Credit Rating Agency or ICRA provides the company-rating and bond-rating services by using international scale. ICRA compares a firm's ability to pay debt obligations with global related-industry firms or institutions. Since global rating agencies have many branches around the world, they can use one country's analysis comparing with other countries' related firms they analyzed. The national scale cannot be compared with the international scale, or even with the national scale rating of another country. To conclude, International scale provides a uniform benchmark to investors across countries, while national scale is for domestic investors.

Table 1 represents the list of approved External Credit Assessment Institutions (ECAIs) released by the Bank of Thailand on February 7, 2008; and provides long-term rating mapping and risk weights for corporate bonds. ECAIs consist of S&P, Moody's, Fitch, Fitch (Thailand) and TRIS. The list of ECAIs is conducted for the purpose of capital requirement for credit risk under Standardized Approach of Basel II[6].

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[6] See more detail in Credit special report: BOT's ECAIs and credit rating mapping for Basel II standardized approach (Jiwariyavej, 2008)

**Table 1: BOT's ECAIs and long-term rating mapping and risk weights for corporate borrowers**

| Borrower Grade | S&P | Moody's | Fitch (Thailand) | TRIS | Risk Weight |
|---|---|---|---|---|---|
| 1 | AAA | Aaa | AAA(tha) | AAA | 20% |
|  | AA+ | Aa1 | AA+(tha) | AA+ |  |
|  | AA | Aa2 | AA(tha) | AA |  |
|  | AA- | Aa3 | AA-(tha) | AA- |  |
| 2 | A+ | A1 | A+(tha) | A+ | 50% |
|  | A | A2 | A(tha) | A |  |
|  | A- | A3 | A-(tha) | A- |  |
| 3 | BBB+ | Baa1 | BBB+(tha) | BBB+ | 100% |
|  | BBB | Baa2 | BBB(tha) | BBB |  |
|  | BBB- | Baa3 | BBB-(tha) | BBB- |  |
| 4 | BB+ | Ba1 |  |  | 100% |
|  | BB | Ba2 |  |  |  |
|  | BB- | Ba3 |  |  |  |
| 5 | B+ | B1 | BB+(tha) | BB+ | 150% |
|  | B | B2 | BB(tha) | BB |  |
|  | B- | B3 | BB-(tha) | BB- |  |
| 6 | CCC+ | Caa1 | B+(tha) | B+ | 150% |
|  | CCC | Caa2 | B(tha) | B |  |
|  | CCC- | Caa3 | B-(tha) | B- |  |
|  | CC | Ca | CCC+(tha) | CCC+ |  |
|  | C | C | CCC(tha) | CCC |  |
|  | D |  | CCC-(tha) | CCC- |  |
|  |  |  | C(tha) | CC |  |
|  |  |  | DDD(tha) | C |  |
|  |  |  | DD(tha) |  |  |
|  |  |  | D(tha) |  |  |

## 2.2. Theoretical Review

There are three main hypotheses that explain the effects of credit rating changes on security prices, which are efficient market hypothesis, information content hypothesis, and issuer industry hypothesis.

## 2.2.1. Efficient Market Hypothesis

The efficient market hypothesis (EMH) is a hypothesis in finance that explains the behavior of security prices with information available in the market. This hypothesis was first introduced by Bacheliar (1967) in his PhD dissertation, The Theory of Speculation and later discussed by Fama (1970), (1991), (1998); Fama et

al. (1969) and Jensen (1978). They stated that efficient market is a market where security prices fully reflect all available information in any point of time and the prices change fast to reflect new information.

There are three underlying assumptions for this hypothesis. First, all investors are independent, rational, well-informed and hope for the highest profits. Second, all information are freely and randomly available in the market. No one can predict the new information and once new information is released into the market, the price will adjust immediately. Finally, there are no transaction costs and taxes in the market.

According to the information available in the market, Fama (1970) divide the hypothesis of market efficiency into three forms as follows.

1) The weak-form efficiency, states that the current security prices fully reflect all historical information. Investors cannot predict the future prices and earn excess returns by using historical information.

2) The semi-strong form efficiency, states that the security prices adjust immediately to the newly and publicly available information in unbiased pattern. Investors cannot earn excess returns or profits by trading on that publicly available information.

3) The strong-form efficiency, states that the security prices immediately and accurately reflect all privately and publicly available information. No one can earn excess returns.

According to the efficient market hypothesis, if rating agencies use public and private information in re-evaluate and change credit ratings, there should be no abnormal returns or price reaction to that new information in the market.

Weinstein (1977) examined monthly price movement of US stocks to rating change announcements during July, 1962 to 1974. He found no abnormal stock returns prior to rating change announcements and little movement in six months after the announcements, supporting the efficient market hypothesis. He suggested that rating agencies did not provide new and important information to the market. Moreover, his findings were also supported by Wakeman (1981)

However, if bond credit rating changes announced by rating agencies lead to significant abnormal returns of securities, this can be explained by the semi-strong form of the market efficient hypothesis as well as the private information, which is available only to credit rating agencies.

**2.2.2. Private Information Hypothesis**

Many papers studied the effect of credit rating changes on security prices and some results of those researches support the private information hypothesis (such as Goh and Ederington (1993); Grier and Katz (1976); Hand et al. (1992); Hite and Warga (1997), etc.). The private information hypothesis states that credit rating changes announced by rating agencies convey certain private information which is not available to the market and significantly influence security prices. The private information hypothesis can also be called the information asymmetric hypothesis and signaling hypothesis.

Credit rating agencies are responsible to evaluate the bond issuers' creditworthiness and ability to pay back debts, and provide important information to the market by re-rating the company rating or bond rating to those firms and its issued bonds. The ratings represent to the bond's default risk level. In addition, rating

agencies evaluate firms from not only publicly available information, but also private information from each firm. Rating agencies have authority to know any insider information and use this information in rating analysis based on the issuer's creditworthiness. They can access private information that is not available to the public such as budget forecasts, internal reports, investment strategies, qualitative assessment of management, and firm prospects. Therefore, any rating change by rating agencies is considered as signaling change of the financial condition and strength of that firm. Investors will perceive rating downgrades as bad news or a sign of future financial downturn of the firm, whereas perceive rating upgrades as good news or the sign of potential financial upturn of the firm.

Therefore, the private information hypothesis suggests that the security price will significantly increase during rating upgrades and fall down during rating downgrades. However, most of previous studies found negative price reaction towards rating downgrades but no negative price reaction to rating upgrades, for example, Goh and Ederington (1993); Pinches and Singleton (1978).

### 2.2.3. Issuer Hypothesis

There are many literatures that examined the effect of credit rating changes on security prices and explained their results with issuer hypothesis. Wansley and Dhillon (1989) suggested that the impact of rating changes to banks is less than industrial firms. In contrast, Schweitzer et al. (1992) examined whether the effect of credit rating changes to banks and corporates is different. They expected that the effect of credit rating changes to banks might be different from corporates since banks are higher regulated institutions. Moreover, they stated that the amount of information

available to the market depends on the regulation of each industry. From the result, they found that rating upgrades did not provide any difference between banks and corporates, while for rating downgrades banks respond significantly stronger than corporates. They explained that banks hind negative information or rating downgrade news, and bond rating agencies are responsible to provide adverse information about banks to the public via rating changes.

On the other hand, Bremer and Pettway (2002) examined the effect of rating downgrades on stock prices of banks in Japan. They found no significant price movement during rating announcement or before the announcement period. However, the average returns of downgraded banks were significantly negative during two years before rating downgrade. They concluded that the stock market takes the higher risk into lower stock prices for downgraded banks very well before the rating were announced by Moody's.

## 2.3. Empirical Review

## 2.3.1. The Effect of Credit Rating Changes on Stock Prices

## i) Research Conducted in the United States

As the United Stated has the most comprehensive and competitive financial market in the world, most of research about the effect of credit rating changes on stock prices have been conducted in the US. Wakeman (1981) initially examined this issue and found no significant abnormal returns during rating upgrade and downgrade announcements, which supported the hypothesis of market efficiency. After that,

Hand et al. (1992); Schweitzer et al. (2001) examined bond and stock prices during rating changes. They found there is significant price reaction of bonds and stocks to rating downgrades.

Furthermore, Goh and Ederington (1993) examined rating changes announced by Moody's and found there is negative price reaction to rating downgrades resulting from deterioration in the company's financial prospects. Dichev and Piotroski (2001) also found share price reaction towards rating downgrades, while there is no price reaction to rating upgrades. Goh and Ederington (1993) explained that not all rating downgrades will result in negative share price reaction. Since some rating changes can be predicted by investors, so news of those changes would not be surprising.

On the other hand, Hsueh and Lui (1992) argued that the effect of rating changes on stock prices would be the same whether the rating is downgraded or upgraded. They examined the effect of credit rating change by considering the market anticipation. They found that the companies with low information available to the public experience significantly falling of stock prices towards rating downgrades and increasing of stock prices towards rating upgrades. In contrast, there is no price movement in the companies with high information available to the market. They concluded that rating changes convey valuable information when the market is high uncertain and the impact will be more severe if the company offers small amount of information to the public.

**ii) Research Conducted in Other Countries**

The research of how rating changes affect US stock market has motivated other researchers to examine this effect in other countries. Barron et al. (1997)

examined the stock price response to rating changes of short-term debts, long-term debts, and new debts in UK during 1984-1992. They found significant negative price reaction during rating downgrades but no price reaction during rating upgrades. In Japan, Li et al. (2006) compared the stock price reaction to credit changed by global rating agencies versus local rating agencies. They found that the response of stock prices is stronger to rating announced by global rating agencies than local agencies.

In Australia, Matolcsy and Lianto (1995) investigated the stock price response to credit rating changed by S&P during 1982-1991. They found significant negative price reaction towards rating downgrades, but no price reaction during rating upgrades. The similar results were found by Choy et al. (2006). They found only significant stock price reaction during rating downgrades and the effect was stronger significantly when the ratings were downgraded across multiple classes. Creighton et al. (2007) extended the study of Choy et al. (2006) by examining the effect of rating changes on bond and stock prices. They found that bond and stock prices increase and decrease significantly following rating upgrades and downgrades respectively.

Recently, Chan et al. (2009) investigated the information content between the subscription-based rating agency (Corporate Scorecard Group) and the non-subscription-based rating agencies (Moody's and S&P) in Australia, by using the buy-and-hold abnormal returns (BHARs). They found that there is price reaction to the ratings provided by Corporate Scorecard Group, but no price reaction to rating changed by Moody's and S&P. However, these three researches conducting in Australia provided different results due to different periods of event study, the amount of observations and the contamination of unidentified company-specific factors.

Moreover, capital markets in China, New Zealand, Korea, Malaysia and Spain were also examined. In China, Poon and Chan (2008) investigated stock price in the Shenzhen Stock Exchange to rating changes of 170 bonds during 2002-2006. They found significant negative price reaction to rating downgrades and the negative impact on the speculative grade was higher than the investment grade. In New Zealand, Elayan et al. (2003) found significant negative (positive) price movement during rating downgrade (upgrade) announcements, which supports the hypothesis of wealth redistribution. They concluded that the rating agencies convey valuable information to the market. Their findings were consistent with the research conducted by Creighton et al. (2007) in Australia, which indicated that these markets are less efficient, compared to the US market. The stocks did not adjust immediately to the new information provided in the market, so there were abnormal returns during rating upgrades and downgrades.

Furthermore, Joo and Pruitt (2006) examined the stock price reaction during 1995-2002 and found negative price movement to rating downgrades during economic crisis in Korea. They concluded that rating changes convey valuable information to market participants on companies' condition. In Malaysia, Doma and Omar (2006) examined the stock price reaction towards rating changes during 1993-2003. They found negative price reaction to both rating upgrades and downgrades. They explained that the negative impact came from the South-East Asian financial crisis during 1997-1998. After they modified their data and methodologies, they found negative price reaction to only rating downgrades but no price reaction towards rating upgrades. In contrast, Abad-Romero and Robles-Fernandez (2006) found

significant positive price reaction to rating upgrades, but no price reaction during rating downgrades in Spain.

## 2.3.2. The Effect of Credit Rating Changes on Corporate Bond Prices

Although most of the empirical studies about the impact of credit rating announcement have been mainly focused on stock prices, there are also some literatures studying this effect on bond prices. Katz (1974) firstly studied the price adjustment of bonds during credit rating changes and tested the efficient market hypothesis, by using monthly yield change. The results show that there is no price movement before rating change announcements but find abnormal performance during six to ten weeks after downgrades. Afterwards, Grier and Katz (1976) examined the impact of credit rating changes on bond market through investigating the behavior of the bond market in assimilating new information, using monthly data of utilities and industrials. The results find anticipation in the industrial bond market to reclassifications in ratings and price changes after downgrades. Hettenhouse and Sartoris (1976) also examined the impact of credit changes with monthly yield change. They found little anticipation before rating downgrades and no reaction to rating upgrades.

Weinstein (1977) examined bond prices during 18 to 7 months before rating change announcements but found no price movement. He found no price reaction both before and after the announcements. This evidence contradicted the previous findings of Katz (1974) and Grier and Katz (1976). Hand et al. (1992) examined the price reaction of bonds to bond rating changes using exchange transactions as data. They find significant negative abnormal bond returns during downgrade

announcements. Moreover, abnormal returns for below investment grade are significantly stronger than investment grade for rating downgrade.

Moreover, Wansley et al. (1992) examined the impact of bond rating changes on bond prices by using weekly data. The results showed significantly negative returns in the week of downgrades but no significant response to upgrades. Afterwards, Hite and Warga (1997) found significant abnormal bond returns both before and after rating downgrades. They suggested that the effect of rating downgrade is more significant when ratings are below investment grade.

Furthermore, there are a few studies on non-US market. Steiner and Heinke (2001) examined abnormal Eurobond prices with rating change and watchlisting announcements by Moody's and S&P. The results showed significantly negative abnormal returns 90 days before negative watchlistings and downgrade announcements, whereas positive watchlistings and upgrade announcements have no effects. In contrast, May (2010) recently found the significant negative abnormal returns during rating downgrades and also significant positive abnormal returns during rating upgrades.

## 2.3.2. The Effect of Credit Rating Changes on Thai Financial Market

All researches studying the effect of credit rating changes in Thailand have been focused only on stock market. Vaithanomsat (2001) firstly investigated the effect of the credit rating change announcements of banks listed on SET on their stock returns. She found the significantly positive abnormal stock returns for upgrades and negative abnormal stock returns for downgrades. Then, Piyakulvorawat (2003) studied the effect of the credit rating change announcements of bonds on the stock

prices, examining firms listed on SET and assigned their credit rating by TRIS Rating. The result showed that there are significantly negative abnormal stock returns to downgrades and positive abnormal stock returns to upgrades as well. After that, Veeravongchairoj (2007) examined the effect of credit changes on Thai stock market and investigated the different effect of credit rating announced by global rating agencies (Moody's, S&P) and local rating agencies (TRIS Rating and Fitch Rating). The result showed that there are significantly negative abnormal stock returns to downgrades and positive abnormal stock returns to upgrades like the previous studies. Moreover, the price reaction is significantly stronger when ratings announced by global rating agencies.

Recently, Archapairoj (2008) re-examined the effect of credit rating changes on stock prices by controlling the rating changes' market anticipation and investigated whether the effect will be significant only when the market is high uncertain. The result showed that abnormal stock returns are differently significant during rating upgrades and downgrades based on the amount of information available to the market.

# CHAPTER III

# DATA AND METHODOLOGY

## 3.1. Data and Sample

The sample consists of credit rating changes for all Thai firms rated by global rating agencies (Moody's, S&P) and local rating agencies (TRIS Rating and Fitch Rating). The credit rating announcements of Mood's, S&P, TRIS Rating and Fitch Rating (Thailand) are obtained by Reuters Database and TRIS Rating website (www.trisrating.com) from January 1996 to April 2012. The sample includes only actual rating changes, rating upgrades and downgrades. The historical data of stocks and bonds are collected from 120 trading days before the announcement date to 15 trading days after the announcement date. Moreover, this paper examines mainly on investment grade investment grade bonds' rating changes: AAA, AA, A, and BBB.

For bonds, daily mark-to-market data of clean prices, trade date, time to maturity, coupon, and accrued interests are collected from Thailand Bond Market Association (ThaiBMA) from July 2006 to April 2012 to calculate actual returns. The sample of bond prices and other characteristics for our analysis is constrained by limited availability of data in Thai bond market. Problems of corporate bonds are that not many companies issue bonds and they are traded not frequently like stocks. Therefore, it is difficult to get long period and large sample for bond prices.

In addition, the bond sample includes long-term (at least one year maturity) and fixed-rate corporate bonds issued by Thai firms registered in ThaiBMA.

Moreover, stock market returns, Thai interbank rate or risk-free rate, book-to-market stock returns, 10-year Thai government bond yield, 1-month T-bill yield and Baa bond yield are collected from DataStream and ThaiBMA to calculate the expected bond returns by employing five-factor model.

For stocks, the daily stock prices, trade dates and total return index on the Stock Exchange on Thailand are obtained from DataStream during January 1996 to April 2012. Finally, all samples of corporate bonds and stocks are classified by (1) credit rating upgrade and downgrade announcements; (2) credit rating agencies: TRIS rating, Fitch rating, Standard & Poor's (S&P) and Moody's Investor Services (Moody's); and (3) firm industries: financial firms (banking, finance and securities, and insurance) and non-financial firms (Argo & food industry, industrials, property & construction, resources, services and technology)[7].

Table 2 reports the distribution of corporate bond sample during July 2006 – April 2012 by rating agency, rating class, industry group and calendar year. The full sample of 40 upgrades consists of 30 upgrades by TRIS, 9 upgrades by Fitch and 2 upgrades by S&P. The full sample of 20 downgrades consists of 13 downgrades by TRIS, 6 downgrades by Fitch and 1 downgrade by Moody's. According to sample distribution by letter rating class after changing, large observations of upgrades are upgraded to A and large observations of downgrade sample are downgraded to BBB.

According to sample distribution by issuer industry, large observations of upgrades are financial firms, following by property and construction. Similarly, large observations of downgrades are financial firms and property and construction. Lastly,

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[7] The firm industry classification is obtained from the Stock Exchange of Thailand (SET).

according to sample distribution by calendar year, large observations of upgrades occurred in 2008 and 2010, whereas large observations of downgrades occurred in 2009 and 2011.

**Table 2**
**Distribution of corporate bond sample**

| | Upgrade | | | | | Downgrade | | | | |
| | Local Agency | | Global Agency | | | Local Agency | | Global Agency | | |
| | All | TRIS | Fitch | Moody's | S&P | All | TRIS | Fitch | Moody's | S&P |
|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Distribution by post-downgrade or post-upgrade letter rating class** | | | | | | | | | | |
| AAA | 4 | | 4 | | | | | | | |
| AA | 10 | 8 | 2 | | | 4 | 1 | 3 | | |
| A | 23 | 20 | 3 | | | 6 | 4 | 2 | | |
| BBB | 3 | 1 | | | 2 | 10 | 8 | 1 | 1 | |
| Total | 40 | 30 | 9 | | 2 | 20 | 13 | 6 | 1 | |
| **Panel B: Distribution by industry group** | | | | | | | | | | |
| Financials | 11 | 7 | 2 | | 2 | 6 | 5 | 1 | | |
| Non-financials | | | | | | | | | | |
| -Argo & Food Industry | 4 | 4 | | | | | | | | |
| -Consumer Products | | | | | | | | | | |
| -Industrials | 2 | | 2 | | | 1 | | 1 | | |
| -Property & Construction | 9 | 9 | | | | 6 | 4 | 2 | | |
| -Resources | 4 | 2 | 2 | | | 3 | | 2 | 1 | |
| -Services | 7 | 6 | 1 | | | 4 | 4 | | | |
| -Technology | 3 | 1 | 2 | | | | | | | |
| Total | 40 | 30 | 9 | | 2 | 20 | 13 | 6 | 1 | |
| **Panel C: Distribution by calendar year** | | | | | | | | | | |
| 2006 | | | | | | | | | | |
| 2007 | 7 | 5 | 2 | | | 2 | 2 | | | |
| 2008 | 10 | 6 | 4 | | | 1 | 1 | | | |
| 2009 | 2 | 2 | | | | 9 | 4 | 5 | | |
| 2010 | 13 | 10 | 2 | | 1 | 2 | 1 | 1 | | |
| 2011 | 6 | 4 | 1 | | 1 | 6 | 5 | | 1 | |
| 2012 | 2 | 2 | | | | | | | | |
| Total | 40 | 30 | 9 | | 2 | 20 | 13 | 6 | 1 | |

**Table 3**
**Distribution of stock sample**

| | Upgrade | | | | | Downgrade | | | | |
| | | Local Agency | | Global Agency | | | Local Agency | | Global Agency | |
| | All | TRIS | Fitch | Moody's | S&P | All | TRIS | Fitch | Moody's | S&P |
|---|---|---|---|---|---|---|---|---|---|---|
| **Panel A: Distribution by post-downgrade or post-upgrade letter rating class** | | | | | | | | | | |
| AAA | | | | | | | | | | |
| AA | 4 | 2 | 2 | | | | | | | |
| A | 8 | 8 | | | | | | | | |
| BBB | 37 | 33 | | 3 | 1 | 8 | 3 | 1 | 4 | |
| Total | 58 | 13 | 16 | 9 | 20 | 36 | 14 | 5 | 9 | 8 |
| **Panel B: Distribution by industry group** | | | | | | | | | | |
| Financials | 48 | 15 | 13 | 7 | 13 | 19 | 1 | 2 | 9 | 7 |
| Non-financials | | | | | | | | | | |
| -Argo & Food Industry | 4 | 4 | | | | 3 | 3 | | | |
| -Consumer Products | 1 | 1 | | | | | | | | |
| -Industrials | 2 | 2 | | | | 1 | 1 | | | |
| -Property & Construction | 17 | 17 | | | | 9 | 6 | 3 | | |
| -Resources | 21 | 9 | 2 | 5 | 5 | | | | | |
| -Services | 8 | 7 | 1 | | | 10 | 6 | | 4 | |
| -Technology | 6 | 1 | 2 | | 3 | 2 | | 1 | | 1 |
| Total | 107 | 56 | 18 | 12 | 21 | 44 | 17 | 6 | 13 | 8 |
| **Panel C: Distribution by calendar year** | | | | | | | | | | |
| 1996 | | | | | | | | | | |
| 1997 | | | | | | 14 | | | 8 | 6 |
| 1998 | | | | | | 2 | | | | 2 |
| 1999 | | | | | | | | | | |
| 2000 | 1 | | | 1 | | | | | | |
| 2001 | 3 | 2 | | | 1 | | | | | |
| 2002 | 7 | 3 | 4 | | | 1 | 1 | | | |
| 2003 | 8 | 1 | | 5 | 2 | | | | | |
| 2004 | 11 | 4 | 2 | 1 | 4 | 1 | 1 | | | |
| 2005 | 27 | 10 | 4 | 3 | 10 | | | | | |
| 2006 | 10 | 5 | 2 | 1 | 2 | 2 | 1 | 1 | | |
| 2007 | 4 | 4 | | | | 4 | 3 | 1 | | |
| 2008 | 13 | 8 | 4 | 1 | | 4 | 4 | | | |
| 2009 | 2 | 2 | | | | 5 | 2 | 2 | 1 | |
| 2010 | 10 | 8 | 1 | | 1 | 3 | | 1 | 2 | |
| 2011 | 9 | 7 | 1 | | 1 | 8 | 5 | 1 | 2 | |
| 2012 | 2 | 2 | | | | | | | | |
| Total | 107 | 56 | 18 | 12 | 21 | 44 | 17 | 6 | 13 | 8 |

Table 3 reports the distribution of stock sample during January 1996 – April 2012 by rating agency, rating class, industry group and calendar year. The full sample of 107 upgrades consists of 56 upgrades by TRIS, 18 upgrades by Fitch, 12 upgrades by Moody's and 21 upgrades by S&P. The full sample of 44 downgrades consists of 17 downgrades by TRIS, 6 downgrades by Fitch, 13 downgrades by Moody's and 8 downgrades by S&P.

According to sample distribution by letter rating class after changing, large observations of upgrades and downgrades are in BBB grade. According to sample distribution by issuer industry, large observations of upgrades and downgrades are financial. According to sample distribution by calendar year, large observations of upgrades occurred in 2005, whereas large observations of downgrades occurred in 1997. In conclusion, most of rating changes are more upgraded than downgraded, and TRIS rating has the largest announcement of rating changes in Thailand.

## 3.2. Hypothesis Development

According to four research objectives in introduction chapter, the hypotheses are developed as follows

### 3.2.1 Impact of Credit Rating Changes on Stock and Corporate Bond Prices

Since this thesis aims to examine the impact of credit rating changes on stock and corporate bond prices in Thailand, the efficient market and private information hypothesis are used to discuss and explain the results. The following hypotheses are developed:

Hypothesis 1: There are significantly negative (positive) abnormal stock returns during credit rating downgrades (upgrades)

Hypothesis 2: There are significantly negative (positive) abnormal bond returns during credit rating downgrades (upgrades)

As rating agencies are responsible to evaluate the firms' creditworthiness and their ability to pay back debts or future obligations, they can access private information such as budget forecasts, internal reports, investment strategies, qualitative assessment of management, firm prospects, and firm's position in that industry that are not available to the market. They can upgrade or downgrade the company ratings and bond ratings by analyzing from publicly and privately available information. Therefore, rating change announcement can convey valuable information to financial market. Investors will perceive rating upgrades as good news and rating downgrade as bad news since these rating changes represent the firm's financial position, its default risk and its future financial indicator.

Therefore, stock and corporate bond prices are expected to significantly increase during rating upgrades and fall down during rating downgrades. If there are significant abnormal returns after credit rating change announcements, this can be explained by the efficient market hypothesis and the availability of private information to credit rating agencies.

**3.2.2. Relative Comparison between Corporate Bonds and Stocks (Market Reactions and the Speed of Price Adjustment)**

This thesis also compares the market reactions and the speed of price adjustment between stock and corporate bond prices during the same study period, from July 2006 to April 2012, with the same credit rating change announcements and firms. The following hypotheses are developed:

Hypothesis 3: The impact of credit rating changes on corporate bond prices is significantly stronger than stock prices

Hypothesis 4: The corporate bond prices take longer times than stock prices in price adjustment.

Although credit rating changes affect stock and corporate bond prices, the impact on stock and corporate bond prices will be different when they are controlled by the same rating change announcements and firms. Credit rating is directly related to corporate bonds since it reflects the probability of default for issued corporate bonds and its ability to pay back debts. Therefore, the impact of credit rating changes on corporate bond prices is expected to be significantly stronger than on stock prices.

In addition, credit rating changes can be announced late on the trading day, there could be some delayed price adjustment of stock and corporate bond prices. They do not completely price the information immediately at the announcement date. Furthermore, corporate bonds are not frequently traded and liquid like stocks. Corporate bond prices should take longer times than stock prices in absorbing the rating change information.

### 3.2.3. Financial VS Non-financial Firms

Many previous studies examined the effect of credit rating changes to security prices and compared the effect between financial and non-financial industries. Wansley and Dhillon (1989) found that the effect of credit rating changes is weaker for financial industries than for industrial industries, whereas Schweitzer et al. (1992) found that the effect of credit rating downgrades is stronger for financial industries than non-financial industries. Their results can be explained by the issuer hypothesis that the effect of credit rating changes is different across industries due to regulations. If issuing financial firms in the market are higher regulated by many regulations and acts, the issuer hypothesis suggests that the prices of those highly regulated firms react stronger than prices of lower regulated firms such as non-financial firms. According to the previous studies and the issuer hypothesis, the following hypothesis is developed to this paper.

Hypothesis 5: The impact of credit rating changes on stock prices of financial firms is stronger than non-financial firms.

Hypothesis 6: The impact of credit rating changes on corporate bond prices of financial firms is stronger than non-financial firms.

According to the industry classification by the Stock Exchange of Thailand, financial industry is divided into three sub-sectors which are banking, finance and security, and insurance institutions. These financial institutions have to be regulated by Ministry of Finance, Bank of Thailand and other commissions, depend on its type

of financial institution businesses, identified by Bank of Thailand[8]. Moreover, each type of financial institution businesses has to follow its related regulations and laws; for example, commercial banks need to follow Financial Institutions Businesses Act, B.E.2551, securities companies need to follow the Securities and Exchange Act, B.E.2535, etc. Therefore, financial institutions are higher regulated firms compared to other industries, which can explained by the issuer hypothesis that the prices of higher regulated firms should move after rating changes significantly stronger than lower regulated firms.

In addition, financial institutions are important to either domestic or external economic sectors for a country. They confront with various risk and volatilities, which could affect other sectors in the economics. So, they have to maintain an efficient and stable financial institution system for financial system stability and stable economic growth. As a result, rating changes are good indicators of firms whether better or worse financial and economic growth. Rating downgrades are expected to affect stronger than upgrades. Firms cannot provide all bad news of their institutions to the public since it can affect their financial system stability. Since financial institutions obtain sources of funds from investors and its customers, bad news can decrease its credit reputations and funds finally. Therefore, it is possible that financial institutions might hide some bad news or negative information to maintain depositors/customers/or investors' confidence in their firms and retain their capability to attract more capital in the markets. Then, credit rating agencies, which can access

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[8] Financial institutions in Thailand and related regulator and laws, from Bank of Thailand, website: http://www.bot.or.th/English/FinancialInstitutions/FIStructure/FI_System/Regulator/Pages/Regulator.a spx (Bank of Thailand, 2008)

private information, will be responsible to provide valuable information about the firms' creditworthiness and financial positions to the market via credit rating changes.

### 3.2.4. Influence of credit rating agencies

From the previous studies, the influence of credit rating agencies can affect the security price movement differently. Li, Shin, & Moore (2006) examined the reaction of stock prices of firms listed in the Tokyo Stock Exchange of Japan to rating changes announced by global credit rating agencies versus local credit rating agencies. They found that global credit rating agencies are more influential for rating changes than local credit rating agencies, especially downgrades. They explained that global rating agencies have long-term experiences, then investors believe that they have specialized skills in analyzing credit worthiness of firms than local rating agencies. Therefore, the following hypothesis is developed.

Hypothesis 7: Global rating agencies (Moody's and S&P) significantly influence stronger abnormal returns during credit rating change announcements than local rating agencies (TRIS and Fitch rating) for stock market.

In Thailand, rating agencies are divided into two group of rating agencies, local rating agencies and global rating agencies. As mentioned in the literature review chapter, TRIS rating Co., Limited and Fitch Ratings (Thailand) Limited are the only two local rating agencies that are approved by SEC to provide credit services to Thai firms registered in ThaiBMA. These two rating agencies are classified as Domestic Credit Rating Agency (DCRA). While, Moody's and S&P are global rating agencies providing rating services to Thai firms and classified as International Credit Rating Agency (ICRA). However, there are differences between these two groups of rating

agencies. First, local rating agencies provide both the company-rating and the bond-rating service, whereas global rating agencies provide only company ratings. Second, local rating agencies use national scale in rating analysis, whereas global rating agencies use international scale. The differences between national and international scale are mentioned in the previous chapter.

Although TRIS and Fitch rating are the only two local rating agencies approved by SEC to provide ratings to Thai firms, they have less experience in rating analysis, evaluation and specialized skills compared to Moody's and S&P. Moreover, Wall Street Journal (2003a) mentioned that Moody's and S&P are top best credit rating agencies that have combined market share in the world credit service for 79%, following by 14% by Fitch and 6% by other credit rating agencies. Therefore, this paper expects the global rating agencies to be more influential to credit rating changes than local rating agencies. This result will confirm that there is no home bias for local rating agencies.

## 3.3. Methodology

The standard event study technique[9] (Brown & Waner, 1985) is employed in this paper to examine abnormal returns during rating change announcements. The event study's whole period starts from 120 trading days before the announcement date and ends at 15 trading days after the announcement date (-120,15). There are three

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[9] Event study method is used to examine whether the market provides any information to the investors and whether any event contains information that can affect the security prices and firm's wealth.

sub-periods in the event study: (1) the announcement date, (2) the estimation period and (3) the event period.

- The announcement date or event date, is at day 0

- Estimation period, starts from 120 trading days before the announcement date to 16 trading days before the announcement date (+120,16) to assess the significance of abnormal returns based on the movements of stock and corporate bond prices.

- Event period, starts from 15 trading days before the announcement date to 15 trading days after the announcement date (-15,15) to isolate the movement of stock and corporate bond prices.
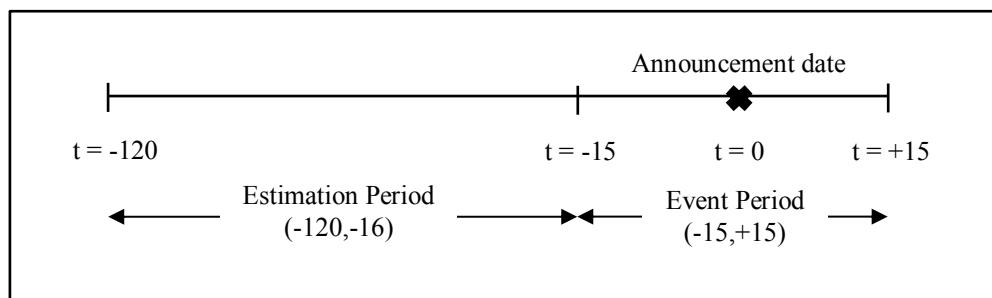


Then, I divide event period (-15,15) into three sub-periods;

- Pre-announcement interval, is during (-15,-1) to investigate possible anticipation effects. Since investors may obtain different data across securities due to available information from different sources and the firm's transparency.

- Announcement intervals, are (0) and (0,1) to measure the market reaction on the announcement date. Two-day window (0,1) is used to allow for delayed rating change announcements after trading hours since the announcement indicates only

the date not the time[10]. Delayed announcements can result in a price change on next trading day.

- Post-announcement intervals, are (2,5), (2,10) and (11,15) to measure the market reactions after the announcements including the market efficiency and the speed of price adjustment. The efficient market hypothesis states that rating agencies do not provide any information to market participants since they analyze the creditworthiness of firms from publicly available information. If the market is efficient, then the average abnormal return should be zero after the announcement. For the earlier date of announcement, market efficiency has no implication. That is, any average abnormal return is possible.

### 3.3.1. Stocks

**(i)    Calculate of abnormal stock returns**

Firstly, I calculate daily actual stock return for each firm *i* from 120 trading days before the announcement date to 15 trading days after the announcement date (-120,15).

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \tag{1}$$

Where $R_{it}$ is actual stock return of firm i on day t. $P_{it}$ is the daily stock price of firm i on day t. $P_{it-1}$ is the daily stock price of firm i on day t-1.

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[10] Two-day window is also used by Creighton et al. (2007) and May (2010) due to the similar reasons I explain.

Then, the expected stock returns are calculated for each firm i from 120 trading days before the announcement date to 15 trading days before the announcement date (estimation period) by using market-model-adjusted return[11].

$$E(R_{it}) = \alpha_i + \beta_i \cdot R_{mt} + \varepsilon_{it} \qquad (2)$$

Where $E(R_{it})$ is the expected stock return of each firm on day t. $\alpha_i$ and $\beta_i$ are parameters of the market model. $R_{mt}$ is the stock market returns on day t.

After obtaining actual stock returns and expected stock returns, abnormal stock return for each sample is computed as actual stock return minus expected stock return for the whole period from 120 trading days before the announcement date to 15 trading days after the announcement date:

$$AR_{it} = R_{it} - E(R_{it}) \qquad (3)$$

Where $AR_{it}$ is the abnormal stock return of firm i on day t. $R_{it}$ is the actual stock return of firm i on day t. $E(R_{it})$ is the expected stock return of firm i on day t, which do not experience a rating change on day t -15 to day t +15 or period (-120,-16).

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[11] The market-model-adjusted return is a simple and famous method in calculating the stock returns on this issue. The expected return is calculated from a single factor market model which is market returns. The parameter $\alpha_i$ and $\beta_i$ are calculated by using ordinary least square regression over the estimation period. The advantages of this method are to control the relationship between stock returns and market returns and allow for variation of risks to a selected stock.

(ii) **Calculate daily cumulative average abnormal stock returns**

The abnormal stock returns of each event in event period (-15,15) are calculated for each day and then are aggregated over various event periods to obtain the CARs as:

$$CAR_T = \sum_t^T AR_t \tag{7}$$

The cumulative abnormal returns are aggregated and then averaged across events to draw inferences about the impact of the credit rating change announcement as:

$$\overline{CAR_T} = \frac{1}{N}\sum_t^T CAR_T \tag{8}$$

Where $\overline{CAR_T}$ is the cumulative average abnormal return of overall sample event $n$ from time $t$ to $T$.

**(iii) Determine the significance of cumulative average abnormal stock returns**

T-statistics is computed for each cumulative average abnormal return of stock to determine whether the cumulative average abnormal returns is statistically different from zero.

$$t = \frac{\overline{CAR_T}}{\sqrt{s(CAR)^2 \cdot N}} \tag{9}$$

Where $\overline{CAR_T}$ are the cumulative average abnormal returns for each event window. $s(CAR)$ is the standard deviation of the cumulative abnormal returns during

estimation period (-120,-16). N is the number of cumulative days for each event window.

Moreover, Wilcoxon Signed Rank Test (nonparametric test) is also employed in the significant test in case the $\overline{CAR_T}$ may not be normally distributed and to check the robustness of the results.

$$Z = \frac{W^+ - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}} \qquad (9)$$

The t-statistics and Wilcoxon Signed Rank Test will be tested in six event windows: during pre-announcement period on Day (-15,-1); during announcement period on Day (0) and Day (0,1); and during post-announcement period on Day (2,5), Day (2,10) and Day (11,15). If the t-statistics test is significant, the credit rating announcements affect stock prices. The sign of abnormal returns indicates the impact whether it is negative or positive.

**3.3.2. Bonds**

**(i)    Calculate of abnormal bond returns**

Firstly, I calculate daily actual bond return for each bond $i$ from 120 trading days before the announcement date to 15 trading days after the announcement date (-120,15).

$$R_{it} = \frac{P_{it} - P_{it-1} + AI_{it}}{P_{it-1}} \qquad (4)$$

Where $R_{it}$ is actual bond return for bond i on day t. $P_{it-1}$ is the daily price of bond i on day t-1. $P_{it}$ is the daily price of bond i on day t. $AI_{it}$ is the accrued interest[12] of bond i on day t

Secondly, the expected bond return is calculated for each bond from 120 trading days before the announcement date to 16 trading days before the announcement date (estimation period) by employing five-factor bond model[13] of Fama and French (1993).

$$E(R_{it}) = \alpha + \beta(Rm_t - Rf_t) + s \cdot SMB_t + h \cdot HML_t + t \cdot Term_t + d \cdot Default_t + \varepsilon_t \quad (5)$$

Where $E(R_{it})$ is the expected bond return of bond i on day t. $Rm_t - Rf_t$ is market risk premium (stock market return minus Thai interbank rate or risk-free rate). $SMB_t$ is the size factor (small cap return minus large cap return). $HML_t$ is the value factor (high book-to-market stock return minus low book-to-market stock return). $Term_t$ is the bond market maturity premium (10-year Thai government bond yield minus 1-month T-bill yield). $Default_t$ is the default risk premium (Baa bond yield minus 10-year TH government bond yield).

After obtaining actual bond returns and expected bond returns, I compute the daily abnormal bond return for each bond sample as the actual bond return minus the expected bond return:

$$AR_{it} = R_{it} - E(R_{it}) \quad (6)$$

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[12] The accrued interest on time t is computed from this formula = (annual coupon payment x L) / 360, where L is the number of days between time t-1 and time 1 when the market is closed.
[13] Five-factor bond model is used to estimate abnormal bond returns. It extends the existing three-factor stock return model by adding two additional bond market factors; bond market maturity premium and default risk premium; to estimate expected bond returns.

Where $AR_{it}$ is the abnormal bond return of bond i on day t . $R_{it}$ is the actual bond return of bond i on day t, and $E(R_{it})$ is the expected bond return of bond i on day t during estimation period (-120,-16).

(ii)     **Calculate daily cumulative average abnormal bond returns**

The abnormal bond returns of each event in event period (-15,15) are calculated for each day and then are aggregated over various event periods to obtain the CARs as:

$$CAR_T = \sum_t^T AR_t \qquad (7)$$

The cumulative abnormal returns are aggregated and then averaged across events in order to draw inferences about the effect of the credit rating change announcement as:

$$\overline{CAR_T} = \frac{1}{N}\sum_t^T CAR_T \qquad (8)$$

Where $\overline{CAR_T}$ is the cumulative average abnormal return of overall sample event *n* from time *t* to *T*.

**(iii)     Determine the significance of cumulative average abnormal bondreturns**

The cumulative average abnormal bond returns ($\overline{CAR_T}$ ) will be tested by the T-statistics and Wilcoxon Signed Rank tests whether they are statistically different from zero by the same tests of cumulative average abnormal stock returns. Cumulative average abnormal bond returns will be tested in six event windows: during pre-announcement period on Day (-15,-1); during announcement period on

Day (0) and Day (0,1); and during post-announcement period on Day (2,5), Day (2,10) and Day (11,15). If the t-statistics test is significant, the credit rating announcements affect corporate bond prices. The sign of abnormal returns indicates the impact whether it is negative or positive.

After testing the significant of cumulative average abnormal returns for stocks and corporate bonds separately, the results will be compared among these two markets to see the market reactions to rating changes during the same event study period and with the same rating change announcements and firms.

Lastly, the cumulative average abnormal returns will be divided and tested between financial firms versus non-financial firms for stock and corporate bond prices; and rating changes announced by global versus local credit agencies for stock prices to investigate the possible factors that influence significant abnormal returns during rating change announcements.

**CHAPTER IV**

**RESULTS AND DISCUSSION**

This chapter provides the results from examining the impact of credit rating changes on stock and corporate bond prices according to research objectives. The results are divided into four parts: (1) the impact of credit rating changes on stock and corporate bond prices, (2) relative comparison between stocks and corporate bonds (market reactions and the speed of price adjustment) with the same firms and rating change announcements, (3) the impact of credit rating changes for financial versus non-financial firms and (4) influence of two groups of rating agencies to rating changes.

The results of each part are reported in tables and graphs. Tables report the mean cumulative average abnormal returns (CARs) and significance of t-statistics test and Wilcoxon signed-rank test for 6 event windows. Event window day (-15,-1) refers to pre-announcement period. Event window day 0 and day (0,1) refers to announcement period. Lastly, event window day (2,5), day (2,10) and day (11,15) refer to post-announcement periods. Moreover, graphs or figures show the whole cumulative average abnormal returns from 15 trading days before the announcement date to 15 trading days after the announcement date (-15,+15).

## 4.1. The Impact of Credit Rating Changes on Stocks and Corporate Bonds

This section provides the results of stock and corporate bond price reaction when ratings are upgraded and downgraded. The study finds that rating upgrades and downgrades convey new and valuable information to both stock and corporate bond

markets. The impact of credit rating downgrades is significant stronger than upgrades. Moreover, rating changes have a significant stronger and larger effect on corporate bond prices than stock prices since credit rating changes are directly related to corporate bonds.

### 4.1.1. Stock price reaction during rating changes

**Table 4**
**The stock price reaction during rating changes**
This table reports the stock price reaction during rating upgrades and downgrades. The rating changes were provided by TRIS, Fitch, Moody's and S&P during January 1996 - April 2012. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Event Window (Days) | Stocks (n=152 rating change announcements) | | | | | |
|---|---|---|---|---|---|---|
| | Upgrade (n=107announcements) | | | Downgrades (n=44announcements) | | |
| | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | 0.2083 | 0.3165 | 0.4410 | 0.4240 | 0.2986 | 0.1751 |
| 0 | 0.4236 | 2.4927** | 1.6103 | -0.9792 | -2.6709*** | -3.5244*** |
| (0,1) | 0.7730 | 3.2161*** | 1.7128* | -1.6212 | -3.1269*** | -3.5594*** |
| (2,5) | 0.0436 | 0.1284 | 0.4205 | 0.3265 | 0.4453 | 0.8636 |
| (2,10) | -0.2748 | -0.5390 | 0.0615 | 1.8033 | 1.6396 | 1.6222 |
| (11,15) | 0.2978 | 0.7838 | 0.6359 | -0.0660 | -0.0805 | 0.7235 |

Table 4 reports the stock price reaction during credit rating changes from January 1996 to April 2012. From the table, there are significant positive abnormal returns during rating upgrades and negative abnormal returns during rating downgrades, on day 0 and day (0,1). For upgrades, CAARs on day 0 and day (0,1) are 0.42% and 0.77%, which are significant at the 5% and 1% level based on t-test, respectively. For downgrades, CAARs on day 0 and day (0,1) are -0.98% and -1.62%, which are both significant at the 1% level based on both t-test and signed rank test. The findings suggest that both upgrades and downgrades provide price-relevant

information to stock market participants, which support the private information hypothesis. The private information hypothesis states that credit rating changes announced by rating agencies convey certain private information which is not available to the market and significantly influence security prices.

Moreover, the results of Table 4 show that the proportion of decreasing CAARs for downgrades is larger than the proportion of increasing CAARs for upgrades. CAAR on day 0 for downgrades is significant stronger than upgrades. The results suggest that the impact of credit rating downgrades is significant stronger and larger than upgrades. Downgrades bring more information to the stock market. The results are consistent with the findings of Creighton et al. (2007) and Elayan et al. (2003) who found that stock prices increase after rating upgrading and decrease after rating downgrading significantly.

**Figure 1**
**The cumulative average abnormal returns of stocks during rating changes**
This figure shows daily cumulative average abnormal returns of stocks during rating upgrades and downgrades that are cumulated over a period (-15,+15). The sample includes 107 upgrade announcements of credit rating changes by TRIS Rating, Fitch Rating (Thailand), S&P and Moody's; and 44 downgrade announcements of credit rating changes by TRIS Rating, Fitch Rating (Thailand), S&P and Moody's during January 1996 - April 2012.
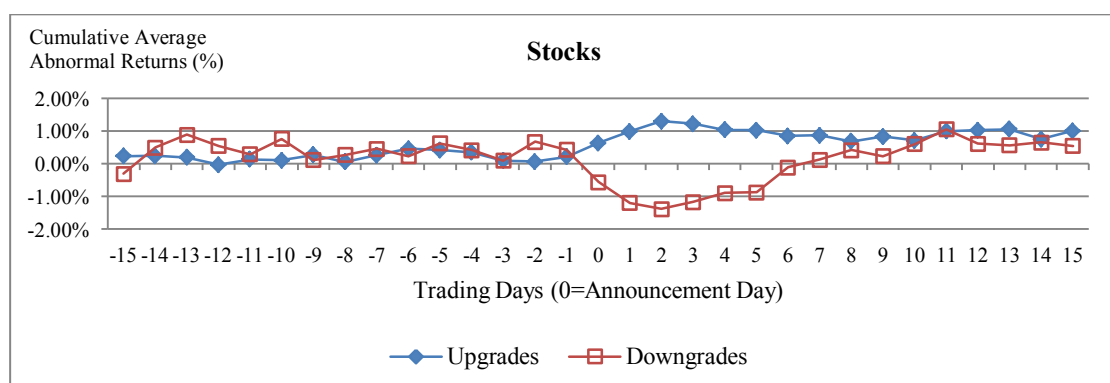


Figure 1 shows the whole picture of daily cumulative average abnormal returns (CAARs) of stocks for upgrades and downgrades, during period (-15,+15).

From the figure, CAARs of upgraded stocks highly increase on the announcement date (day 0) until trading day 2 and slightly decrease after that. Similarly, the cumulative abnormal returns of downgraded stocks highly decrease on the announcement day until trading day 2 and increase after that. This figure indicates that stock prices respond to rating upgrades positively and rating downgrades negatively after rating changes are announced.

## 4.1.2. Corporate bond price reaction during rating changes

**Table 5**
**The corporate bond price reaction during rating changes**
This table reports the corporate bond price reaction during rating upgrades and downgrades. The rating upgrades were provided by TRIS rating, Fitch rating and S&P during July 2006 - April. CAAR is the daily cumulative average abnormal return for each window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| | Corporate bonds (n=60 rating change announcements) | | | | | |
|---|---|---|---|---|---|---|
| Event | Upgrades (n=40announcements) | | | Downgrades (n=20announcements) | | |
| Window | CAAR | t-stat | Signed | CAAR | t-stat | Signed |
| (Days) | (%) | | rank | (%) | | rank |
| (-15,-1) | 0.1562 | 0.5451 | 0.1283 | -0.0767 | -0.2180 | 0.4768 |
| 0 | 0.1690 | 2.2831** | 2.7314*** | -0.3696 | -4.0662*** | -3.1057*** |
| (0,1) | 0.3130 | 2.9903*** | 2.4486** | -0.5876 | -4.5715*** | -2.4216** |
| (2,5) | 0.3276 | 2.2128** | -0.0026 | -0.6144 | -3.3802*** | 0.5360 |
| (2,10) | 0.0783 | 0.3526 | 0.0864 | -0.4320 | -1.5845 | 0.4175 |
| (11,15) | -0.0678 | -0.4096 | 0.0759 | 0.1995 | 0.9814 | 0.8108 |

Table 5 reports the corporate bond price response to credit rating upgrades and downgrades, during July 2006 – April 2012. The results of Table 5 indicate that there are significant positive abnormal returns when ratings are upgrades and negative abnormal returns when ratings are downgraded on three event windows: on day 0, day (0,1) and day (2,5). For upgrades, CAARs on day 0, day (0,1) and day (2,5) are 0.17%, 0.31% and 0.33%, which statistically significant at the 5%, 1% and 5% level,

respectively. For downgrades, CAARs on day 0, day (0,1), and day (2,5) are -0.37%, -0.59%, and -0.61%, which statistically significant at the 1% level. The findings suggest that both upgrade and downgrade announcements provide valuable information to corporate bond market participants, which support the private information hypothesis. The results are consistent to the findings of May (2010) and Creighton, Gower, & Richards (2007), who found significant positive abnormal bond returns during rating upgrades and negative abnormal bond returns during rating downgrades.

However, the results suggest that corporate bonds do not fully incorporate rating change news into bond prices immediately since there are significant abnormal returns in the days after rating change announcements, on day (2,5). It takes few days after the announcement date to absorb the news. Moreover, the results of Table 5 show that the proportion of decreasing CAARs for downgrades is larger than the proportion of increasing CAARs for upgrades. The t-statistics test of CAARs for downgrades is significant stronger than upgrades. These findings indicate that the impact of credit rating downgrades is significant stronger and larger than upgrades. Downgrades provide more valuable information to the corporate bond market. Furthermore, when the results of Table 4 and Table 5 are compared, the impact of credit rating changes on corporate bond prices is significant stronger than on stock prices. This can be explained that credit rating is directly related to corporate bonds since it reflects the probability of default for issued corporate bonds and its ability to pay back debts. Stocks absorb and adjust its prices faster than corporate bonds. This finding suggests that corporate bond market is less efficient than stock market.

Moreover, the results report negative abnormal bond returns after downgrade announcements, which also found in paper of May (2010).

**Figure 2**
**The cumulative average abnormal returns of corporate bonds during rating changes**
This figure shows daily cumulative average abnormal returns of corporate bonds during rating upgrades and downgrades that are cumulated over a period (-15,+15). The sample includes 40 upgrade announcements of credit rating changes by TRIS Rating, Fitch Rating (Thailand) and S&P during July 2006 - April 2012.
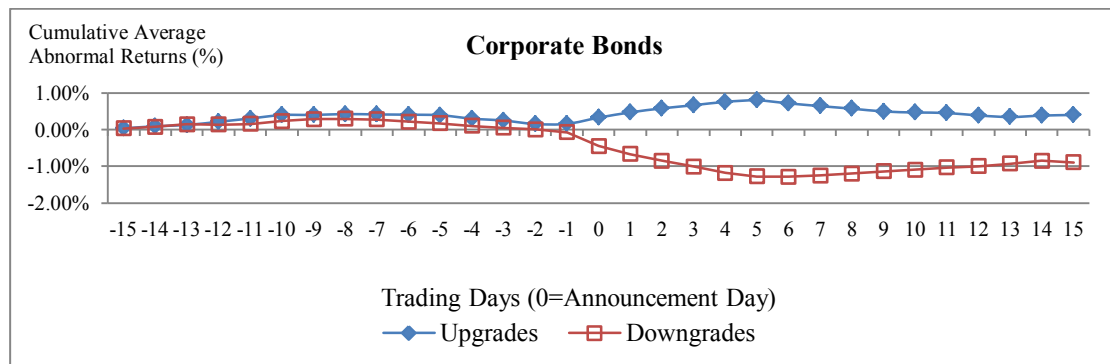


Figure 2 shows the whole picture of daily cumulative average abnormal returns (CAARs) of corporate bonds for upgrades and downgrades, during period (-15,+15). From the figure, CAARs of upgraded bonds highly increase on the announcement date (day 0) until trading day 5 and slightly decrease after that. CAARs of downgraded bonds highly decrease on the announcement date (day 0) until trading day 6 and slight decrease after that. Downgraded bonds take longer time to absorb the news and fully incorporate the news into bond prices than upgraded bonds.

## 4.2. Relative Comparison between Stocks and Corporate Bonds (Market Reactions and the Speed of Price Adjustment)

This section provides more relative comparison between the impact of credit rating changes on stock and corporate bond prices during the same study period, from July 2006 to April 2012, with the same rating change announcements and firms.

Generally speaking, the samples are stock and corporate bond prices of the same firms which affected by the same rating change announcements. The results are compared on the market reactions and the speed of price adjustment between stocks and corporate bonds during rating upgrades and downgrades. For this section, the results suggest that corporate bond market significantly reacts to rating changes stronger and longer than stock market. Moreover, downgrade announcements have a stronger and larger effect than upgrades announcements on both stock and corporate bond prices.

### 4.2.1. Upgrades

**Table 6**
**The stock and corporate bond price reaction during rating upgrades (same rating change announcements and firms)**
This table reports the corporate bond and stock price reaction during rating upgrades, relative to the same rating change announcements and firms. The rating upgrades were provided by TRIS rating, Fitch rating, Moody's and S&P during July 2006 – April 2012. \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Event Window (Days) | Upgrades | | | | | |
|---|---|---|---|---|---|---|
| | Stocks (n=26announcements) | | | Bonds (n=26announcements) | | |
| | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | 0.0253 | 0.0161 | 0.2116 | -0.1247 | -0.3341 | -0.3396 |
| 0 | 0.7865 | 1.9444$^{*}$ | 2.9313$^{***}$ | 0.2526 | 2.6202$^{***}$ | 2.9993$^{***}$ |
| (0,1) | 1.1600 | 2.0279$^{**}$ | 2.8783$^{***}$ | 0.4733 | 3.4716$^{***}$ | 2.8021$^{***}$ |
| (2,5) | -0.8020 | -0.9914 | -0.6455 | 0.4204 | 2.1806$^{**}$ | 0.4491 |
| (2,10) | -0.8635 | -0.7116 | -0.6984 | 0.0948 | 0.3277 | 0.0153 |
| (11,15) | 0.1316 | 0.1456 | 0.3175 | 0.2569 | 1.1917 | 0.8566 |

Table 6 reports the stock and corporate bond price response to rating upgrades, relative to the same rating change announcements and firms. For stocks, there are significant positive abnormal returns on event window day 0 and day (0,1). CAAR on day 0 and day (0,1) are 0.79% and 1.16%, which statistically significant at the 10% and 5% level, respectively. For corporate bonds, there are significant positive

abnormal returns on three event windows: day 0 and day (0,1) during the announcement period; and day (2,5) after the announcement date. CAARs on day 0 and day (0,1) are 0.25% and 0.47%, which strongly significant at the 1% level based on both t-statistics and Wilcoxon signed-rank test. CAAR on day (2,5) is 0.42% and statistically significant at the 5% level. Rating upgrades still provide new and valuable information to stock and corporate bond markets when the observations are smaller.

Comparatively, the impact of credit rating upgrades on corporate bond prices is statistically stronger than stock prices. This finding can be explained that credit rating is directly related to corporate bonds. It reflects the probability of default for issued corporate bonds and its ability to pay back debts. Moreover, abnormal returns of corporate bonds after upgrade announcements stay longer than stock prices. Corporate bonds do not fully incorporate upgrade news into corporate bond prices immediately. It takes longer days to absorb the news than stock prices. This finding suggests that corporate bond market is less efficient than stock market. The result is consistent with the finding of Downing et al. (2009) who found that bond prices respond to upgrade news slower than stock prices. If rating upgrades are driven by publicly available information, the significant positive abnormal returns on day (0,1) indicates the delayed reaction to rating upgrades.

The comparison of upgrades can also be seen from Figure 3. Figure 3 shows the whole picture of daily cumulative average abnormal returns (CAARs) of upgraded stocks and corporate bonds during period (-15,+15). From the figure, CAARs of upgraded stocks highly increase on the announcement date (day 0) until trading day 2 and recover after that. The stock line shows that stock prices overreact to rating

upgrades. While, CAARs of upgraded corporate bonds increase on the announcement

date (day 0) until trading day 5 and slightly decrease after that.

**Figure 3**
**The cumulative average abnormal returns of stocks and corporate bonds during rating upgrades (same rating change announcements and firms)**
This figure shows daily cumulative average abnormal returns of stocks and corporate bonds during rating upgrades, relative to the same firms and rating change announcements. Average abnormal returns are cumulated over a period (-15,+15). The sample includes 26 upgrade announcements of stocks and bonds respectively during January 1996 – April 2012.
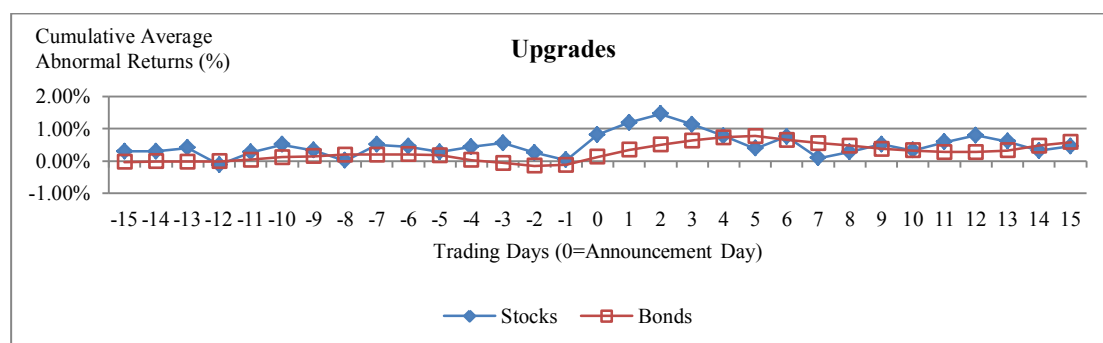


## 4.2.2. Downgrades

**Table 7**
**The stock and corporate bond price reaction during rating downgrades (same rating change announcements and firms)**
This table reports the corporate bond and stock price reaction during rating downgrades, relative to the same rating change announcements and firms. The rating downgrades were provided by TRIS rating, Fitch rating, S&P and Moody's during July 2006 - April 2012. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Downgrades | | | | | | |
|---|---|---|---|---|---|---|
| Event | Stocks (n=11announcements) | | | Bonds (n=11announcements) | | |
| Window (Days) | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | 0.3809 | 0.1403 | 0.3556 | 0.0255 | 0.0629 | 0.5026 |
| 0 | -1.3327 | -1.9010$^*$ | -1.8671$^*$ | -0.3523 | -3.3720$^{***}$ | -2.4308$^{**}$ |
| (0,1) | -2.0927 | -2.1108$^{**}$ | -2.0449$^{**}$ | -0.5842 | -3.9539$^{***}$ | -2.0718$^{**}$ |
| (2,5) | 0.6083 | 0.4338 | 0.3556 | -0.5158 | -2.4684$^{**}$ | -0.7180 |
| (2,10) | 1.8711 | 0.8897 | 0.8891 | -0.6023 | -1.9215$^*$ | 0.0205 |
| (11,15) | 1.2484 | 0.7964 | 0.1778 | 0.0535 | 0.2291 | 0.3692 |

Table 7 reports the stock and corporate bond price response to rating downgrades, relative to the same rating change announcements and firms. For stocks, there are significant negative abnormal returns on event window day 0 and day (0,1). CAAR on day 0 and day (0,1) are -1.33% and -2.11%, which significant at the 10% and 5% level based on both t-statistics and signed-rank tests, respectively. For corporate bonds, there are significant negative abnormal returns on 4 event windows: day 0 and day (0,1) during announcement period; day (2,5) and day (2,10) after the announcement period. CAARs on day 0 and day (0,1) are -0.35% and -0.58%, which statistically significant at the 1% level. CAARs on day (2,5) and day (2,10) are -0.52% and -0.60%, which statistically significant at the 5% and 10% level, respectively. Rating downgrades still provide new and valuable information to stock and corporate bond markets when the observations are smaller.

Comparatively, the impact of credit rating downgrades on corporate bond prices is statistically stronger and longer than on stock prices. This result can be explained as credit rating is directly related to corporate bonds. Corporate bonds do not fully incorporate rating upgrade news into corporate bond prices immediately. It takes longer days to absorb the upgrade news than stock prices that take only few days. This finding suggests that corporate bond market is less efficient than stock market. The results are consistent with the findings of May (2010) who found that corporate bond prices significantly react to rating downgrades stronger and longer than stock prices. He found significant abnormal returns of corporate bonds after announcement for downgrades. He suggests that bond prices might not fully absorb the downgrade news immediately.

In addition, the impact of credit rating changes on corporate bond prices is significant stronger and longer than on stock prices for both rating upgrades and downgrades. The results are consistent with the findings of Creighton et al. (2006), who found abnormal returns of stocks and corporate bonds during rating upgrade and downgrade announcements. They found that the impact of credit rating changes on corporate bond prices is significant stronger than stock prices. Moreover, the result is also consistent with May A.D. (2010) who found that rating downgrades provide more information to the market than rating upgrades.

**Figure 4**
**The cumulative average abnormal returns of stocks and corporate bonds during rating downgrades (same rating change announcements and firms)**
This figure shows daily cumulative average abnormal returns of stocks and corporate bonds during rating downgrades, relative to the same firms and rating change announcements. Average abnormal returns are cumulated over a period (-15,+15). The sample includes 11 upgrade announcements of stocks and bonds respectively during January 1996 – April 2012.
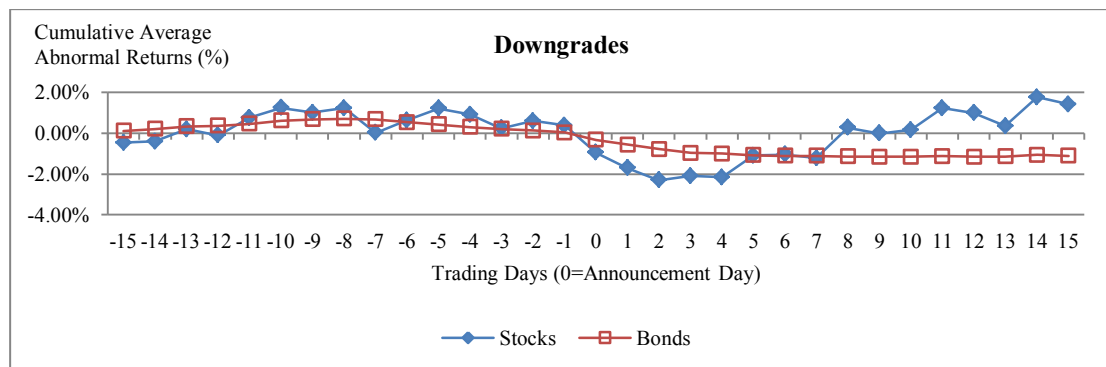


The comparison of the market reactions to rating downgrades can also be seen from Figure 4. Figure 4 shows the whole picture of daily cumulative average abnormal returns (CAARs) of downgraded stocks and corporate bonds during period (-15,+15). From this figure, CAARs of downgraded stocks highly decrease on the announcement date (day 0) until trading day 2 and recover after that. The stock line shows the overreaction of stock prices during rating downgrades. CAARs of downgraded corporate bonds decrease on the announcement date (day 0) until trading

day 10 and slightly increase after that. This finding indicates that corporate bond
market is less efficient than stock market.

## 4.3. Financial firms VS Non-financial firms

This section provides the results of the impact of credit rating changes
between financial firms and non-financial firms for both stocks and corporate bonds,
in order to see if the impact will be different. The results suggest that financial firms
have significantly stronger effects than non-financial firms when ratings are upgraded
and downgraded, for both stocks and corporate bonds.

### 4.3.1. Stocks

**Table 8**
**The stock price reaction during rating upgrades of financial versus non-financial firms**
This table reports the stock price reaction during rating upgrades of financial versus non-financial
firms. The rating changes were provided by TRIS, Fitch, Moody's and S&P during January 1996 –
April. CAAR is the daily cumulative average abnormal return for each event window. ***, **, *
denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Event | Upgrades (n=107announcements) | | | | | |
| Window | Financial firms (n=48announcements) | | | Non-financial firms (n=59announcements) | | |
| (Days) | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
|---|---|---|---|---|---|---|
| (-15,-1) | 0.2965 | 0.3232 | 0.4410 | 0.1366 | 0.1548 | -0.1057 |
| 0 | 0.5083 | 2.1463** | 1.6103 | 0.3547 | 1.5574 | 1.9700** |
| (0,1) | 0.7543 | 2.2519** | 1.7128* | 0.7881 | 2.4470** | 2.3248** |
| (2,5) | 0.4796 | 1.0125 | 0.4205 | -0.3111 | -0.6829 | -0.8680 |
| (2,10) | 0.1574 | 0.2216 | 0.0615 | -0.6265 | -0.9169 | -2.0078 |
| (11,15) | -0.1146 | -0.2163 | 0.6359 | 0.6333 | 1.2437 | 1.0416 |

Table 8 reports the stock price response to rating upgrades for financial and
non-financial firms during January 1996 - April 2012. For financial firms, there are
significant positive abnormal returns on the announcement intervals: day 0 and day
(0,1). CAARs on day 0 and day (0,1) are 0.51% and 0.75%, which are both

statistically significant at 5% level. For non-financial firms, there are significant positive abnormal returns on event window day (0,1). CAAR is 0.79% and statistically significant at the 5% level. However, there are no significant positive abnormal returns of non-financial firms on day 0. One-day delayed reaction on day (0,1) might result from late announcements after trading hours or stocks may not fully incorporate upgrade news to stock prices immediately. It takes one more day to absorb and respond to the news. The results indicate that the impact of credit rating upgrades to financial firms is significant stronger than non-financial firms on day 0.

Comparatively, stock prices of non-financial firms significantly respond to upgrade news slower than stock prices of financial firms. The faster and stronger price response to upgrade news for financial firms on day 0 might result from investors receive upgrade news of financial firms as a good signal of financial and economic growth since financial institutions are important to either domestic or external economic sectors for a country. This result supports the issuer hypothesis which suggests that the prices of higher regulated of financial firms should move after rating changes significantly stronger than lower regulation of non-financial firms. However, this finding is new to this issue since the previous studies did not found different impact between financial and non-financial firms for upgrades.

Figure 5 shows the whole picture of daily cumulative average abnormal returns (CAARs) for upgraded stocks of financial and non-financial firms during period (-15,+15). From the figure, CAARs of financial and non-financial firms increase on the announcement date until trading day 2 and slightly decrease after that. The increasing proportions of CAARs for financial firms are larger than non-financial

firms, which indicate that rating upgrades affect stock prices of financial firms larger than those of non-financial firms.

**Figure 5**
**The cumulative average abnormal returns of stocks during rating upgrades of financial versus non-financial firms**
This figure shows daily cumulative average abnormal returns of stocks during rating upgrades of financial firms versus non-financial firms. Average abnormal returns are cumulated over a period (-15,+15). The sample includes 48 and 56 upgrade announcements of financial firms and non-financial firms respectively during January 1996 – April 2012.
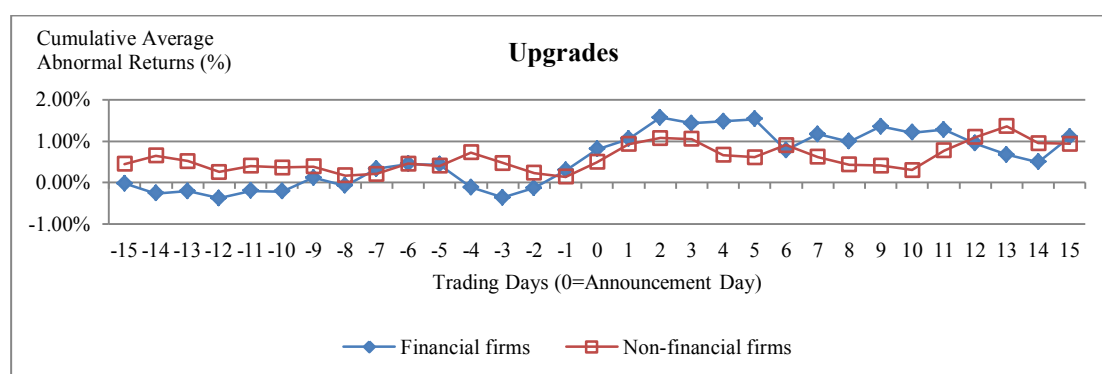


**Table 9**
**The stock price reaction during rating downgrades of financial versus non-financial firms**
This table reports the stock price reaction during rating downgrades of financial versus non-financial firms. The rating changes were provided by TRIS, Fitch, Moody's and S&P during January 1996 – April. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| | Downgrades (n=44announcements) | | | | | |
|---|---|---|---|---|---|---|
| Event | Financial firms (n=19announcements) | | | Non-financial firms (n=25announcements) | | |
| Window | CAAR | t-stat | Signed | CAAR | t-stat | Signed |
| (Days) | (%) | | rank | (%) | | rank |
| (-15,-1) | 0.1337 | 0.0656 | 0.7244 | 0.6445 | 0.3338 | -0.4171 |
| 0 | -1.2653 | -2.404** | -2.8170** | -0.7617 | -1.5278 | -2.2198** |
| (0,1) | -1.8000 | -2.4182** | -2.8170** | -1.4853 | -2.1066** | -2.2736** |
| (2,5) | -0.1171 | -0.1112 | 0.8853 | 0.6636 | 0.6656 | 0.4440 |
| (2,10) | 2.4222 | 1.5341 | 1.3280 | 1.3328 | 0.8911 | 1.0090 |
| (11,15) | 0.4077 | 0.3464 | 0.4427 | -0.4260 | -0.3821 | 0.6592 |

Table 9 reports the stock price response to rating downgrades for financial and non-financial firms during January 1996 – April 2012. For financial firms, there are significant negative abnormal returns on event window day 0 and day (0,1). CAARs

on day (0) and day (0,1) are -1.27% and -1.80%, which are significant at the 5% level based on both the t-test and signed-rank test. For non-financial firms, there are significant negative abnormal returns on event window day (0,1) at the 5% level, based on both the t-test and signed-rank test. The result reports that there are no significant negative abnormal returns for non-financial firms on an announcement date, day 0. One-day delayed reaction on day (0,1) might result from late announcements after trading hours or stocks may not fully incorporate downgrade news to stock prices immediately. It takes one more day to absorb and respond to the news.

Comparatively, the impact of credit rating downgrades to financial firms is significant stronger than non-financial firms on day 0. The faster and stronger price response to downgrade news of financial firms on day 0 might result from investors receive downgrade news of financial firms is more important than to non-financial firms. Downgrade announcements can be perceived as a bad signal of financial and economic growth since financial institutions are important to either domestic or external economic sectors for a country. As a result, they cannot provide all bad news of their institutions to the public since it can affect their financial system stability.

The result is consistent to the finding of Schweitzer et al. (1992) who found that the effect of credit rating downgrades is stronger for financial industries than non-financial industries, which can be explained by the issuer hypothesis. This hypothesis states that the effect of credit rating changes is different across industries such financial and non-financial firms due to the regulatory environment of issuers. Financial institutions obtain sources of funds from investors and its customers, so bad

news can decrease its credit reputations and funds finally. Therefore, it is possible that financial firms might hide some bad news or negative information to maintain depositors/customers/or investors' confidence in their firms and retain their capability to attract more capital in the markets. Then, credit rating agencies, which can access private information, will be responsible to provide valuable information about the firms' creditworthiness and financial positions to the market via credit rating changes.

**Figure 6**
**The cumulative average abnormal returns of stocks during rating downgrades of financial versus non-financial firms**
This figure shows daily cumulative average abnormal returns of stocks during rating downgrades of financial firms versus non-financial firms. Average abnormal returns are cumulated over a period (-15,+15). The sample includes 19 and 25 downgrade announcements of financial firms and non-financial firms respectively during January 1996 – April 2012.
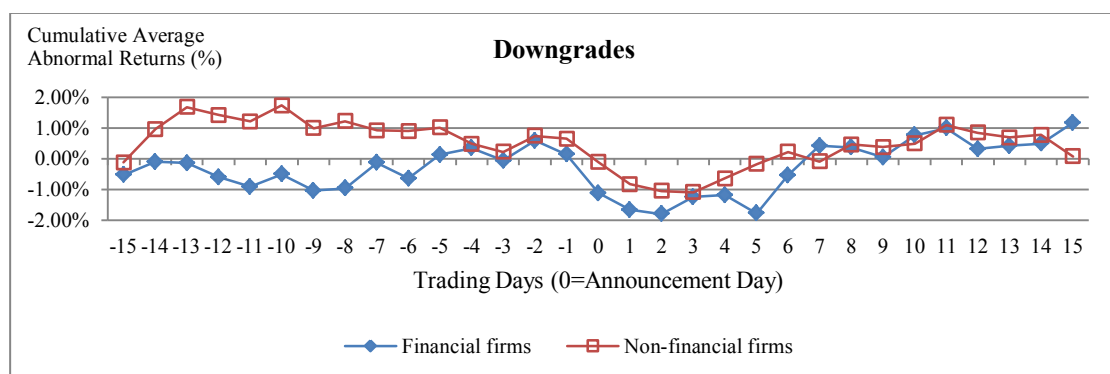


Figure 6 shows the whole picture of daily cumulative average abnormal returns (CAARs) for downgraded stocks of financial and non-financial firms during period (-15,+15). From the figure, CAARs of financial firms decrease on the announcement date until trading day 2, fall down again on day 5 and recover after that. CAARs of non-financial firms decrease on the announcement date until trading day 3 and recover after that. The figure shows the overreaction of stock prices during rating downgrades after the announcements. Overall, the proportion of decreasing CAARs for financial firms is larger than non-financial firms.

### 4.3.2. Corporate Bonds

**Table 10**
**The corporate bond price reaction during rating upgrades of financial versus non-financial firms**
This table reports the corporate bond price reaction during rating upgrades of financial versus non-financial firms. The rating changes were provided by TRIS rating, Fitch rating and Moody's during July 2006 - April. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Event Window (Days) | Upgrades (n=40announcements) | | | | | |
|---|---|---|---|---|---|---|
| | Financial firms (n=11announcements/17bonds) | | | Non-financial firms (n=29announcements/103bonds) | | |
| | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | 0.5517 | 1.0560 | 0.7811 | 0.0909 | 0.2126 | 0.1878 |
| 0 | 0.2373 | 1.7594$^*$ | 2.1539$^{**}$ | 0.1577 | 1.8405$^*$ | 2.2437$^{**}$ |
| (0,1) | 0.6056 | 3.1746$^{***}$ | 1.8225$^*$ | 0.2647 | 2.1845$^{**}$ | 2.0266$^{**}$ |
| (2,5) | 0.4463 | 1.6545$^*$ | -0.2130 | 0.3080 | 1.7971$^*$ | 0.1283 |
| (2,10) | 0.1667 | 0.4120 | 0.0710 | 0.0637 | 0.2478 | 0.1678 |
| (11,15) | -0.2413 | -0.7999 | -0.4024 | -0.0392 | -0.2044 | 0.1908 |

Table 12 reports the corporate bond price response to rating upgrades for financial firms and non-financial firms during July 2006 – April 2102. For financial firms, there are significant positive abnormal returns on three event windows: day 0 and day (0,1) during announcement date; and on day (2,5) after the announcement date. CAARs on day 0, day (0,1) and day (2,5) are 0.24%, 0.61% and 0.45%, which statistically significant at the 10%, 1% and 10% level, respectively. For non-financial firms, there are significant positive abnormal returns on three event windows: day 0 and day (0,1) during announcement date; and on day (2,5) after the announcement date. CAARs on day 0, day (0,1) and day (2,5) are 0.15%, 0.26% and 0.31%, which statistically significant at the 10%, 5% and 10% level, respectively. The significant positive abnormal returns after the days of announcement suggest that corporate

bonds do not fully incorporate upgrade news into corporate bond prices immediately. They take few days to absorb the news.

Comparatively, the impact of credit rating changes on corporate bond prices of financial firms is significant stronger than those of non-financial firms on day (0,1), which support the issuer hypothesis. Moreover, CAARs of upgraded financial firms are larger than non-financial firms during rating upgrades. The results suggest that upgrade news affect stock prices of financial firms than non-financial firms. Moreover, corporate bonds are different from stocks that they have significant abnormal returns after the announcement date. This finding suggests that corporate bond market is less efficient than stock market. This evidence is new since there have been no studies to test the issuer hypothesis on corporate bond market.

**Figure 7**
**The cumulative average abnormal returns of corporate bonds during rating upgrades of financial versus non-financial firms**
This figure shows daily cumulative average abnormal returns of corporate bonds during rating upgrades of financial firms and non-financial firms. Average abnormal returns are cumulated over a period (-15,+15). The sample includes 11 and 29 upgrade announcements of financial firms and non-financial firms respectively during July 2006 - April 2012.
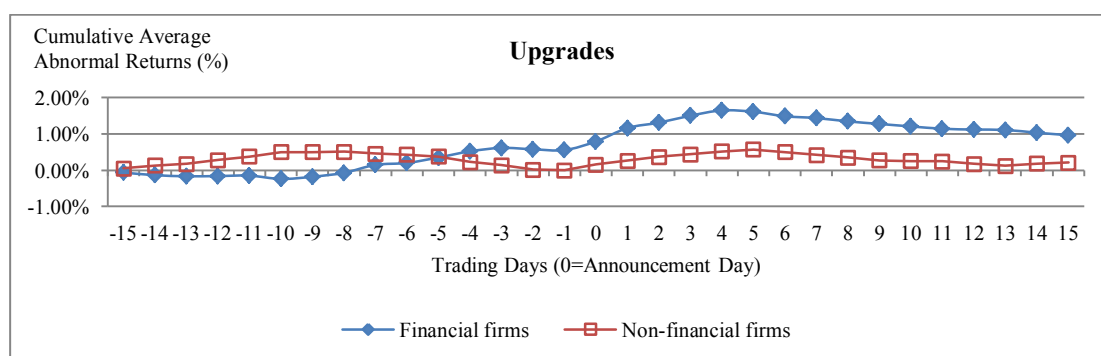


Figure 7 shows the whole picture of daily cumulative average abnormal returns (CAARs) of upgraded corporate bonds for financial and non-financial firms during period (-15,+15). From the figure, CAARs of financial firms increase on the

announcement date (day 0) until trading day 4 and slightly fall down after that. While, CAARs of non-financial firms increase on the announcement date until trading day 5, and slightly decrease after that. Comparatively, the proportion of increasing CAARs for financial firms is larger than non-financial firms. This finding indicates that rating upgrade announcements affect stock prices of financial firms stronger than non-financial firms.

**Table 11**
**The corporate bond price reaction during rating downgrades of financial versus non-financial firms**
This table reports the corporate bond price reaction during rating downgrades of financial versus non-financial firms. The rating changes were provided by TRIS rating, Fitch rating and Moody's during July 2006 - April 2012. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| Event Window (Days) | Downgrades (n=20announcements) | | | | | |
|---|---|---|---|---|---|---|
| | Financial firms (n=6announcements/31bonds) | | | Non-financial firms (n=14announcements/41bonds) | | |
| | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | -0.5562 | -1.3500 | -0.5862 | 0.2858 | 1.5663 | 1.1209 |
| 0 | -0.4039 | -3.7964*** | -2.1083** | -0.3437 | -2.5659** | -2.2224** |
| (0,1) | -0.6112 | -4.0629*** | -1.6146 | -0.5698 | -2.6084*** | -1.5744 |
| (2,5) | -0.7247 | -1.6690* | 0.4422 | -0.5310 | -2.0387** | 0.5119 |
| (2,10) | -0.2832 | -0.8875 | 0.4628 | -0.5445 | -2.0532** | 0.4341 |
| (11,15) | 0.2482 | 1.0435 | 0.3599 | 0.1627 | 0.3804 | 0.9524 |

Table 11 reports the corporate bond price response to rating downgrades for financial and non-financial firms during July 2006 – April 2012. For financial firms, there are significant negative abnormal returns on day 0 and day (0,1) during announcement period; and on day (2,5) after the announcement date. CAARs on day 0 and day (0,1) are -0.40% and -0.61%, which statistically significant at the 1% level. CAAR on day (2,5) is -0.72% and weakly significant at the 10% level. For non-financial firms, there are significant negative abnormal returns on day 0 and day (0,1)

during announcement period; and on day (2,5) and day (2,10) after the announcement date. CAARs on day 0 and (0,1) are -0.34% and -0.57%, which are statistically significant at the 5% and 1% level, respectively. CAARs on day (2,5) and day (2,10) are -0.53% and -0.54%, which statistically significant at the 5% level. The results find the significant negative abnormal returns in the days after the announcement date for financial and non-financial firms. Corporate bonds do not fully incorporate downgrade news into bond prices immediately. They take many days to absorb the news, especially for non-financial firms.

Comparatively, CAARs of downgraded financial firms are larger and significantly stronger than CAARs of non-financial firms during announcement period, days 0 and day (0,1). This finding suggest that the impact of rating downgrades to financial firms is significant stronger than non-financial firms. Investors absorb and react to downgrade news of financial firms faster than non-financial firms. Investors receive downgrade news of financial firms more important than non-financial firms. Downgrades of financial firms might be perceived as a bad signal of financial and economic growth since financial institutions are important to either domestic or external economic sectors for a country. Financial institutions obtain sources of funds from investors and its customers, so bad news can decrease its credit reputations and funds finally. Therefore, it is possible that financial firms might hide some bad news or negative information to maintain depositors/customers/or investors' confidence in their firms and retain their capability to attract more capital in the markets. Then, credit rating agencies, which can access private information, will be responsible to provide valuable information about the firms' creditworthiness and

financial positions to the market via credit rating changes. Although this evidence is

new to corporate bond market, the explanation is similar to stock market.

**Figure 8**
**The cumulative average abnormal returns of corporate bonds during rating downgrades of**
**financial versus non-financial firms**
This figure shows daily cumulative average abnormal returns of corporate bonds during rating
downgrades of financial firms versus non-financial firms. Average abnormal returns are cumulated
over a period (-15,+15). The sample includes 6 and 14 downgrade announcements of financial firms
and non-financial firms respectively during July 2006 - April 2012.
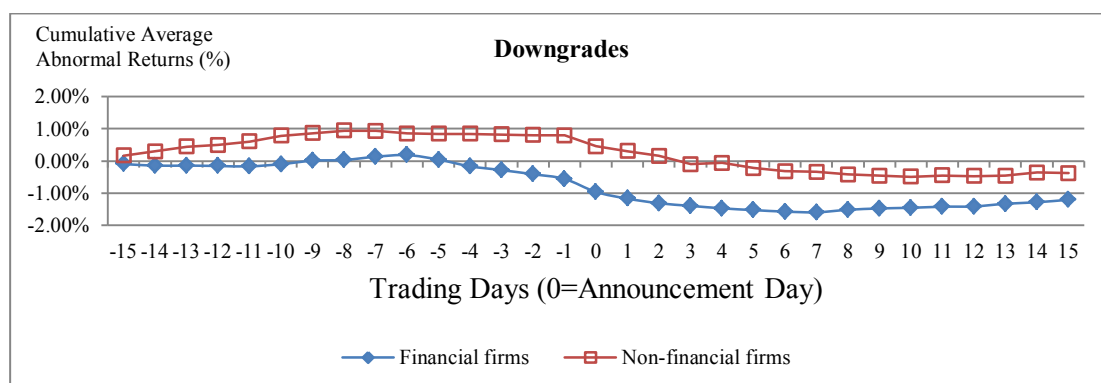


Figure 8 shows the whole picture of daily cumulative average abnormal

returns (CAARs) of downgraded corporate bonds for financial firms and non-financial

firms. From the figure, CAARs of financial firms start falling since day 4 before an

announcement date, which indicate that there might be possible anticipation effects or

bad news affecting the bond prices before the announcements. CAARs of financial

firms apparently decrease again on the announcement date (day 0) until trading day 6

and slightly increase after that. While, CAARs of non-financial firms fall down on the

announcement date, but in the smaller amount. Overall, the proportion of decreasing

CAARs for financial firms is larger than non-financial firms.

Summarily, the impact of credit rating changes for financial firms is

significant stronger and larger than for non-financial firms on both stock and

corporate bond prices, which supports the issuer hypothesis. The issuer hypothesis

states that the effect of credit rating changes is different across industries due to the regulations. If issuing financial firms in the market are higher regulated by many regulations and acts, the issuer hypothesis suggests that the prices of those highly regulated firms react stronger than prices of lower regulated firms such as non-financial firms.

## 4.4. Influence of Credit Rating Agencies

According to the previous research, the influence of credit rating agencies can affect the security price movement differently. This section provides the results of relative influence between local and global rating agencies on stock price reaction during rating change announcements, whether which group influences abnormal stock returns. Local rating agencies consist of TRIS rating and Fitch rating. Global rating agencies consist of S&P and Moody's. The results suggest that global credit rating agencies such Moody's and S&P are more influential to credit rating changes than local credit rating agencies such TRIS and Fitch.

### 4.4.1 Upgrades

Table 12 reports the stock price response to rating upgrades announced by local credit rating agencies (TRIS rating and Fitch rating) and global credit rating agencies (Moody's and S&P) during January 1996 to April 2012. For upgrades by local rating agencies, there are significant positive abnormal returns on event window day 0 and day (0,1). The mean CARs on day 0 and day (0,1) are 0.31% and 0.61%, which statistically significant at the 10% and 5% level, respectively. For upgrades by global credit rating agencies, there are significant positive abnormal returns on event

window day 0 and day (0,1). The mean CARs on day 0 and day (0,1) are 0.69% and

1.14%, which statistically significant at the 5% and 1% level respectively.

**Table 12**
**The stock price reaction during rating upgrades announced by local (TRIS and Fitch rating)**
**versus global (Moody's and S&P) credit rating agencies**
This table reports the stock price reaction during rating upgrades announced by local credit rating
agencies (TRIS rating and Fitch Rating) versus global credit rating agencies (S&P and Moody's). The
rating changes were provided by TRIS, Fitch, Moody's and S&P during January 1996 – April. CAAR
is the daily cumulative average abnormal return for each event window. ***, **, * denote significance
at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| | Upgrades (n=107announcements) | | | | | |
|---|---|---|---|---|---|---|
| Event | Local agencies (n=74announcements) | | | Global agencies (n=33announcements) | | |
| Window | CAAR | t-stat | Signed | CAAR | t-stat | Signed |
| (Days) | (%) | | rank | (%) | | rank |
| (-15,-1) | -0.0810 | -0.9369 | -0.1051 | 0.8572 | 0.8247 | 0.5271 |
| 0 | 0.3050 | 1.7494$^{*}$ | 2.4054$^{**}$ | 0.6895 | 2.5693$^{**}$ | 1.9029$^{*}$ |
| (0,1) | 0.6099 | 2.0696$^{**}$ | 2.4485$^{**}$ | 1.1387 | 3.0002$^{***}$ | 2.0459$^{**}$ |
| (2,5) | 0.3844 | 0.6931 | -0.6384 | -0.7205 | -1.3423 | -0.5092 |
| (2,10) | 0.0642 | -0.1139 | -0.9455 | -1.0351 | -1.2856 | -1.8851 |
| (11,15) | 0.0735 | 0.1473 | 0.5576 | 0.8008 | 1.3344 | 1.2775 |

The results indicate that the mean CARs of stocks upgrades by global rating

agencies are larger and significant stronger than upgrades by local rating agencies.

This study suggests that global rating agencies influence abnormal returns during

rating upgrades than local credit rating agencies. Since global rating agencies have

long-term experiences, investors believe that they have specialized skills in analyzing

credit worthiness of firms than local rating agencies. This evidence is new to this

issue since the previous study found only different influence for rating downgrades.

Figure 9 shows the whole picture of daily cumulative average abnormal

returns (CAARs) of stocks upgraded by local and global credit rating agencies during

period (-15,+15). From the figure, CAARs of stocks upgraded by global agencies

highly increase on the announcement date (day 0) until trading day 2 and decline after that. CAARs of stocks upgraded by local agencies also increase on the announcement date until trading day 2 and slightly decrease after that. However, the proportion of increasing CAARs of stocks upgraded by global rating agencies is larger than local rating agencies. This figure indicates that global rating agencies influence the positive abnormal returns during rating upgrades. Moreover, the figure shows the overreaction of stock prices after upgrade announcements, especially for global agencies.

**Figure 9**
**The cumulative average abnormal return of stocks during rating upgrades announced by local (TRIS and Fitch) versus global (Moody's & S&P) credit rating agencies**
This figure shows daily cumulative average abnormal returns of stocks during rating upgrades announced by local credit rating agencies (TRIS rating and Fitch rating) versus global credit rating agencies (S&P and Moody's). Average abnormal returns are cumulated over a period (-15,+15). The sample includes 74 and 33 upgrade announcements of firms rated by local agencies and global agencies respectively during January 1996 – April 2012.
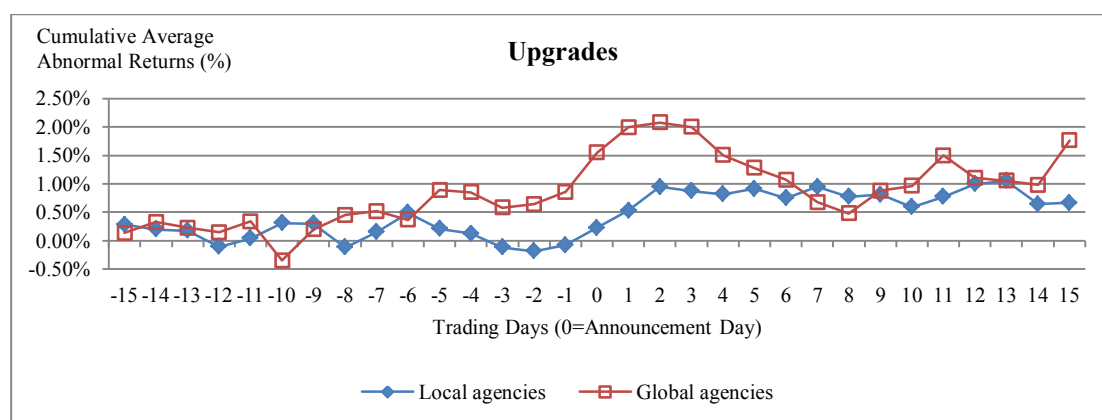


## 4.4.2. Downgrades

Table 13 reports the stock price response to rating downgrades announced by local credit rating agencies (TRIS and Fitch rating) and global credit rating agencies (Moody's and S&P). For downgrades by local rating agencies, there are significant negative abnormal returns on day 0 and day (0,1) during announcement date. CAARs on day 0 and day (0,1) are -0.83% and -1.24%, which statistically significant at the

10% level. For downgrades by global rating agencies (Moody's and S&P), there are significant negative abnormal returns on day 0 and day (0,1) during announcement date. CAARs on day 0 and day (0,1) are -1.14 and -2.04%, which statistically significant at the 5% and 1% level, respectively.

**Table 13**
**The stock price reaction during rating downgrades announced by local credit rating agencies (TRIS and Fitch rating) versus global credit rating agencies (Moody's and S&P)**
This table reports the stock price reaction during rating downgrades announced by local agencies (TRIS rating and Fitch Rating) versus global agencies (S&P and Moody's). The rating changes were provided by TRIS, Fitch, Moody's and S&P during January 1996 – April. CAAR is the daily cumulative average abnormal return for each event window. ***, **, * denote significance at the 1%, 5%, and 10% levels in two-tailed tests, respectively.

| | Downgrades (n=44announcements) | | | | | |
|---|---|---|---|---|---|---|
| Event | Local agencies (n=23announcements) | | | Global agencies (n=21announcements) | | |
| Window (Days) | CAAR (%) | t-stat | Signed rank | CAAR (%) | t-stat | Signed rank |
| (-15,-1) | 0.6834 | 0.3541 | -0.3650 | 0.1398 | 0.0692 | 0.5387 |
| 0 | -0.8324 | -1.6701$^*$ | -2.0378$^{**}$ | -1.1399 | -2.1859$^{**}$ | -3.0761$^{***}$ |
| (0,1) | -1.2394 | -1.7584$^*$ | -1.9466$^*$ | -2.0394 | -2.7652$^{***}$ | -3.1456$^{***}$ |
| (2,5) | 0.1809 | 0.1815 | 0.4866 | 0.4860 | 0.4660 | 0.7820 |
| (2,10) | 1.1812 | 0.7900 | 0.9124 | 2.4846 | 1.5881 | 1.3729 |
| (11,15) | 0.1018 | 0.0914 | 0.8516 | -0.2497 | -0.2142 | 0.1217 |

The results indicate that CAARs of stocks downgraded by global rating agencies are larger and significant stronger than downgrades by local rating agencies. This finding suggests that global rating agencies influence stronger abnormal returns during rating downgrades than local rating agencies. The result is consistent with the finding of Li, Shin, and Moore (2006). They examined the reaction of stock prices of firms listed in the Tokyo Stock Exchange of Japan to rating changes announced by global rating agencies versus local credit rating agencies. They found that the effect of stocks downgraded by global agencies is significantly stronger than local agencies. The explanation for this finding is that global rating agencies have long-term

experiences, so investors believe that they have specialized skills in analyzing credit worthiness of firms than local rating agencies.

**Figure 10**
**The cumulative average abnormal return of stocks during rating downgrades announced by local agencies (TRIS rating and Fitch rating) versus global agencies (S&P and Moody's)**
This figure shows daily cumulative average abnormal returns of stocks during rating downgrades announced by local agencies (TRIS rating and Fitch rating) versus global agencies (S&P and Moody's). Average abnormal returns are cumulated over a period (-15,+15). The sample includes 23 and 21 downgrade announcements of firms rated by local agencies and global agencies respectively during January 1996 – April 2012.
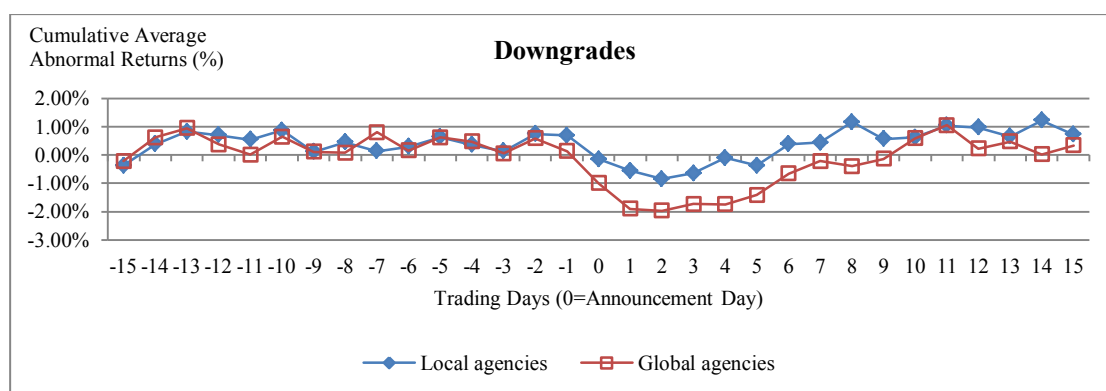


The results of relative influence between two groups of credit rating agencies on stock prices can also be seen from Figure 10. The Figure 10 shows the whole picture of daily cumulative average abnormal returns (CAARs) of stocks downgraded by local and global rating agencies. From the figure, CAARs of stocks downgraded by two groups of credit rating agencies highly decrease on the announcement date (Day 0) until trading day 2 and recover after that. However, the proportion of decreasing CAARs of stocks downgraded by global agencies is larger than by local agencies. This figure indicates that global agencies influence the negative abnormal returns during rating downgrades.

Summarily, credit rating agencies play an important role in conveying new and valuable information to stock and corporate bond market participants, might be

good or bad information. Each of credit rating agencies is different by their analysis processes, market share and reputation (Jewell and Livingston, 1999). Therefore, the content and quality of information they communicate to the markets are also different.

**CHAPTER V**

**CONCLUSION AND AREAS FOR FUTURE RESEARCH**

This paper examines the impact of credit rating changes on stock prices of firms listed in the Stock Exchange of Thailand during January 1996 – April 2012. This paper also sheds further light on this issue by investigating the impact of credit rating changes on corporate bond prices of firms registered in Thai Bond Market Association (ThaiBMA) during July 2006 to April 2012. The results of this paper suggest that both credit rating upgrades and downgrades provide price-relevant information to stock and corporate bond market participants. There are significant negative abnormal returns during rating downgrades and positive abnormal returns during rating upgrades. Rating downgrade is bad news for investors, whereas rating upgrade is good news for investors. The findings support the hypothesis of private information, which states that credit rating changes announced by rating agencies convey certain private information which is not available to the market and significantly influence security prices.

Moreover, this paper compares the market reactions and the speed of price adjustment between stock and corporate bond prices during July 2006 – April 2012, with the same rating change announcements and firms. The results report that corporate bond market significantly reacts to rating changes stronger and longer than stock market since credit rating change is directly related to corporate bonds. It reflects the probability of default for issued corporate bonds and its ability to pay back debts. Moreover, corporate bonds do not fully incorporate rating change news into corporate bond prices immediately. It takes longer days to absorb the news than stock

prices which results in the significant abnormal returns in the days after the announcement date. The findings suggest that corporate bond market is less efficient than stock market

Furthermore, this paper aims to investigate the factors that cause the abnormal returns during rating change announcements. This paper examines the impact of credit rating changes on stock and corporate bond prices for highly regulated of financial firms and lower regulated of non-financial firms. The results suggest that financial firms have significantly stronger effects than non-financial firms during rating change announcements, especially downgrades. This finding supports the issuer hypothesis which suggests that the prices of higher regulated of financial firms should move after rating changes significantly stronger than lower regulation of non-financial firms. The impact on financial firms is stronger since financial institutions are important to either domestic or external economic sectors for a country. They are an indicator of financial and economic growth as they are sources of funds for many businesses. Rating changes can affect their reputations and funds.

Lastly, this paper also examines whether credit rating agencies can influence the price movement of stocks during rating change announcements. The results suggest that global rating agencies (Moody's and S&P) influence stronger abnormal returns during rating changes than local credit rating agencies (TRIS and Fitch rating). Since global rating agencies have long-term experiences, so investors believe that they have specialized skills in analyzing credit worthiness of firms than local rating agencies.

However, the analysis of corporate bond prices might be biased since it is constrained by limited availability of data in Thai bond market. Problems of corporate bonds are that not many companies issue bonds and they are traded not frequently like stocks. Therefore, it is difficult to get long period and large sample for bond prices. Moreover, the market share of corporate bonds is not publicly provided, then the issued bonds of one firm are equally averaged. The weighted averaged actual prices of issued bonds of one firm will provide more accurate results. The future research about the impact of credit rating changes on corporate bond prices with longer study period and more information publicly provide would provide clearer evidence.

# APPENDICES

**APPENDIX A**

**List of firms and their industries and business sectors for bond sample during July 2006 to April 2012. All firms below are registered in Thai Bond Market Association (ThaiBMA). The data is collected from ThaiBMA's website.**

| No. | Name | Industry | Sector |
|---|---|---|---|
| 1 | Asian Seafoods Coldstorage | Argo & Food Industry | Food and Beverage |
| 2 | Charoen Pokphand Foods | Argo & Food Industry | Food and Beverage |
| 3 | Minor International | Argo & Food Industry | Food and Beverage |
| 4 | Mitr Phol Sugar | Argo & Food Industry | Agribusiness |
| 5 | Thai Beverage | Argo & Food Industry | Food and Beverage |
| 6 | Bank of Ayudhya | Financials | Banking |
| 7 | Easy Buy | Financials | Finance and Securities |
| 8 | Kasikornbank | Financials | Banking |
| 9 | Krung Thai Bank | Financials | Banking |
| 10 | Krungthai Card | Financials | Finance and Securities |
| 11 | Siam City Bank | Financials | Banking |
| 12 | Siam Commercial Bank | Financials | Banking |
| 13 | Thanachart Bank | Financials | Banking |
| 14 | Thanachart Capital | Financials | Banking |
| 15 | TMB Bank | Financials | Banking |
| 16 | Demlerchrysler (Thailand) | Industrials | Automotive |
| 17 | Mercedes-Benz (Thailand) | Industrials | Automotive |
| 18 | Asian Property Development | Property & Construction | Property Development |
| 19 | Central Pattana | Property & Construction | Property Development |
| 20 | Ch. Karnchang | Property & Construction | Property Development |
| 21 | Holcim Capital (Thailand) | Property & Construction | Construction Materials |
| 22 | Italian-Thai Development | Property & Construction | Property Development |
| 23 | MBK | Property & Construction | Property Development |
| 24 | Preuksa Real Estate | Property & Construction | Property Development |
| 25 | Quality Houses | Property & Construction | Property Development |
| 26 | Sansiri | Property & Construction | Property Development |
| 27 | Siam Cement | Property & Construction | Construction Materials |
| 28 | Supalai | Property & Construction | Property Development |
| 29 | Ticon Industrial Connection | Property & Construction | Property Development |
| 30 | Banpu | Resources | Energy & Utilities |
| 31 | Energy Fund Administration Institute | Resources | Energy & Utilities |
| 32 | Gulf Cogeneration | Resources | Energy & Utilities |
| 33 | PTT Aromatics and Refining | Resources | Energy & Utilities |
| 34 | PTT Exploration and Production | Resources | Energy & Utilities |
| 35 | PTT | Resources | Energy & Utilities |
| 36 | Bangkok Dusit Medical Services | Services | Health Care Services |
| 37 | Bangkok Expressway | Services | Transportation & Logistics |
| 38 | Eternal 3 Special Purpose Vehicle | Services | Finance and Securities |
| 39 | Home Product Center | Services | Commerce |
| 40 | Regional Container Lines | Services | Transportation & Logistics |
| 41 | Siam Panich Leasing | Services | Finance and Securities |
| 42 | Thai Airways International | Services | Transportation & Logistics |
| 43 | Total Access Communication | Technology | Information & Communication |

**APPENDIX B**
**List of firms and their industries and business sectors for stock sample during January 1996 to April 2012. All firms below are registered in the Stock Exchange of Thailand (SET). The data is collected from SET's website.**

| No. | Name | Industry | Sector |
|---|---|---|---|
| 1 | Asian Seafoods Coldstorage | Argo & Food Industry | Food and Beverage |
| 2 | Charoen Pokphand Foods | Argo & Food Industry | Food and Beverage |
| 3 | Minor International | Argo & Food Industry | Food and Beverage |
| 4 | Sri Trang Argo-Industry | Argo & Food Industry | Agribusiness |
| 5 | I.C.C. International | Consumer Products | Fashion |
| 6 | Aeon Thana SinSap (Thailand) | Financials | Finance and Securities |
| 7 | Bangkok Bank | Financials | Banking |
| 8 | Bank of Ayudhya | Financials | Banking |
| 9 | CIMB Thai Bank | Financials | Banking |
| 10 | Bangkok Insurance | Financials | Insurance |
| 11 | Kasikornbank | Financials | Banking |
| 12 | KGI Securities | Financials | Finance and Securities |
| 13 | Kiatnakin Bank | Financials | Banking |
| 14 | Krung Thai Bank | Financials | Banking |
| 15 | Phatra Leasing | Financials | Finance and Securities |
| 16 | Siam Commercial Bank | Financials | Banking |
| 17 | Thitikorn | Financials | Finance and Securities |
| 18 | TMB Bank | Financials | Banking |
| 19 | Sahaviriya Steel Industries | Industrials | Steel |
| 20 | Vinythai | Industrials | Petrochemicals & Chemicals |
| 21 | Asian Property Development | Property & Construction | Property Development |
| 22 | Central Pattana | Property & Construction | Property Development |
| 23 | CH. Karnchang | Property & Construction | Property Development |
| 24 | Hemraj Land and Development | Property & Construction | Property Development |
| 25 | Italian-Thai Development | Property & Construction | Property Development |
| 26 | Lalin Property | Property & Construction | Property Development |
| 27 | MBK | Property & Construction | Property Development |
| 28 | MK Real Estate Development | Property & Construction | Property Development |
| 29 | Noble Development | Property & Construction | Property Development |
| 30 | Property Perfect | Property & Construction | Property Development |
| 31 | Pruksa Real Estate | Property & Construction | Property Development |
| 32 | Quality Houses | Property & Construction | Property Development |
| 33 | Rojana Industrial | Property & Construction | Property Development |
| 34 | Sansiri | Property & Construction | Property Development |
| 35 | Siam Cement | Property & Construction | Construction Materials |
| 36 | Siam Future Development | Property & Construction | Property Development |
| 37 | Sino-Thai Engineering and Construction | Property & Construction | Property Development |
| 38 | Supalai | Property & Construction | Property Development |
| 39 | Banpu | Resources | Energy & Utilities |
| 40 | PTT | Resources | Energy & Utilities |
| 41 | PTT Exploration and Production | Resources | Energy & Utilities |
| 42 | Ratchaburi Electricity | Resources | Energy & Utilities |
| 43 | The Bangchak Petroleum | Resources | Energy & Utilities |
| 44 | Bangkok Dusit Medical Services | Services | Health Care Services |
| 45 | Bangkok Expressway | Services | Transportation & Logistics |
| 46 | Dusit Thani | Services | Tourism & Leisure |
| 47 | Home Product Center | Services | Commerce |
| 48 | Regional Container Lines | Services | Transportation & Logistics |
| 49 | Sub Sri Thai | Services | Transportation & Logistics |
| 50 | Thai Airways International | Services | Transportation & Logistics |
| 51 | Advanced Info Service | Technology | Information & Communication |
| 52 | Total Access Communication | Technology | Information & Communication |

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