THE MARKET AND SPECIFIC SECTOR STOCK PRICES REACTION AROUND CORPORATE BOND'S CREDIT RATING AND OUTLOOK CHANGES – EVIDENCE IN THAILAND

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An Independent Study Submitted in Partial Fulfillment of the Requirements

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การตอบสนองของราคาหุ้นในตลาดและหมวดธุรกิจเฉพาะเจาะจง ต่อการเปลี่ยนแปลงอันดับความน่าเชื่อถือและเครดิตพินิจของหุ้นกู้ - การศึกษาในประเทศไทย

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By	Miss Kittika Sansanavanee
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Thesis Advisor	Tanawit Sae-Sue

Accepted by the FACULTY OF COMMERCE AND ACCOUNTANCY, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Science

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กิตติกา ศันสนะวาณี : การตอบสนองของราคาหุ้นในตลาดและหมวดธุรกิจเฉพาะเจาะจงต่อการเปลี่ยนแปลงอันดับความน่าเชื่อถือและเครดิตพินิจของหุ้นกู้ - การศึกษาในประเทศไทย . (THE MARKET AND SPECIFIC SECTOR STOCK PRICES REACTION AROUND CORPORATE BOND'S CREDIT RATING AND OUTLOOK CHANGES – EVIDENCE IN THAILAND) อ.ที่ปรึกษาหลัก : ธนวิต แซ่ซือ

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This study examines stock price reaction around credit rating and outlook changes in Thailand. We collect data from stocks listed in SET (The Stock Exchange of Thailand) which issued corporate bonds. These bonds must be listed in TBMA (The Thai Bond Market Association) and were rated by either Tris or Fitch rating Thailand between 2002-2020 (corporate bond credit rating and outlook change). We also study further about the effect of these credit rating events in 3 sectors of stock - Banking, Finance and Property Development. The empirical result shows that good credit events provide significant positive abnormal stock return after the announcement in both full sample (general stock) and 3 sectors sample, while bad credit event announcements do not provide any significant negative abnormal stock return. To precisely investigate the impact of credit event announcements, we add control variable to eliminate partially effect of other factors in our experiment. We found that cumulative abnormal return of stocks in 3 sectors is significantly greater than stocks in other sectors during good credit event announcements, but we did not find evidence that cumulative abnormal return of stocks in 3 sectors is lower than the cumulative abnormal return of stocks in other sectors during bad credit event announcements.

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Introduction

Numerous studies have been studying the stock price's reaction to various events for a long time. For example, Loughran and Ritter (1995) and Spies and Affleck-Graves (1995) studied the stock prices after the initial public offering and found that stocks would underperform three to five years thereafter. Ikenberry, Lakonishok, and Vermaelen (1995) investigated the stock prices after share repurchasing and discovered the abnormal. Another example is Ikenberry, Rankine, and Stice (1996) studied the stock prices after stock plits and spotted significant abnormal returns. Several more events were tested. In this paper, reports issued by credit rating agencies are the main interested event. The report often includes credit rating update (upgrade and downgrade) and, more interestingly, rating outlook (positive and negative) of the corporate bond of the listed company. Rating outlook is often overlooked by retail investors while they contain important market information of the reviewed company.

Credit rating and change in outlook events for bonds could, arguably, be distantly related to the stock prices or stockholders, but many studies found that the stock prices react significantly with bond rating changes. Credit rating and outlook changes could even be better indicators for stock prices than analyst target price forecast. Evidence from past studies documented that the analyst forecast has insignificant or weak relationship with the stock prices despite its widespread availability and easy accessibility. Some literatures such as Barber et al. (2001) stated that the analyst forecast seems to be a biased indicator because most analysts work in the brokerage company and have a tendency to recommend buying more than selling for higher fees from frequent trading activities. Consequently, analysts incline to withhold from sell recommendation even the stock prices go down. Meanwhile, the credit rating and outlook appear to be less biased because they both have quite equal upgrade and downgrade or positive and negative outlook events.

Since credit rating agencies claim that bond rating changes partially reflect some insider information such as the firm’s acquisition, expansion, new product, and debt issuance plans, which is still not publicly available at the moment. These could be signals of changes in the company fundamentals, future earnings, trend of the industry, and ultimately the stock prices. Credit rating agencies have played a major role in informing the market about the credit quality of the firm. Credit rating and outlook are the financial information that receives considerable attention from the

investor and widely used in portfolio management, risk management, and asset pricing. In particular, both equity and fixed income fund manager use the information from credit rating agencies to assist their investment decision. The criteria to change the rating of rating agencies are especially strict that ratings are only changed when firms face extreme alteration. Consequently, when firms are downgraded, it reflects a sharp drop in their performance or fundamentals may often be assumed. This will lead the firms to face the selling pressure by institutions such as asset management company that fund manager have strict rules about holding the securities (e.g., beta of stock not more than some threshold or rating A- up). Furthermore, this paper considers rating outlook as a precious information conveyed to the capital market, because rating outlook is the faster tool that credit rating agency uses to signal the potential upgrade or downgrade within 6 months to two years. Along with rating outlook changes announcement, the credit rating agency provide additional information and opinion as well.

Consequently, the effect of credit rating and outlook changes is worth studying for a couple of reasons. First, bond rating and outlook changes are common and well-publicized information events. Second, past studies found that the bond rating change can capture economically significant shifts of the firms' condition. This is consistent with Griffin and Savicente (1982) whose work showed that upgrade or downgrade of the bond had a significant effect on stock prices. Following Griffin and Savicente (1982), several more studies including Holthausen and Leftwich (1986), Wansley and Clauretie (1985), Cornell et al. (1989) Hand er al. (1992), Goh and Ederington (1993,1999), Norden and Weber (2004), Li et al. (2006) and Kim and Nabar (2007) found significant of stock prices reaction with downgrade event but insignificant with upgrade event. Nevertheless, Dichev and Piotroski (2001), Jorion et al. (2005), and Jorion and Zhang (2007), Heejin Yang, Hee-Joon Ahn, Maria H. Kim and Doojin Ryu (2017) found statistically significant in stock prices reaction in both upgrade and downgrade event. Even though rich research has studied the impact of credit rating changes, none of them has ever mentioned the impact of rating outlook on the stock prices.

In this paper, we explore the effect of credit rating and outlook changes event (public announcement) in Thailand on stock prices listed in SET (The Stock Exchange of Thailand) especially those in Banking, Finance and Property Development sectors due to the uniqueness and compelling characteristics of Thai market structure and businesses. First, the major participants in Thai stock and

corporate bond market are retail investors, who are generally considered uninformed and possibly not fully rational traders, whereas the major participant in many countries bond market are institutional investors. Second, the size of Thai bond market is the fourth biggest in APAC ex. Japan and China as of August 2020 according to International Capital Market Association. And outstanding of Thai bond market is about 91% of Thai GDP. Meanwhile, Thailand market capitalization is about 86% of Thai GDP, the data was provided by ThaiBMA as of September 2020. No attention has been paid to examining the stock price's reaction around rating and outlook change announcement in Thailand. It is worth examining the effect of bond rating and outlook changes on stock prices reaction as one of the representative emerging market. This makes Thailand a laboratory for investigating. Third, abundant studies tend to focus on the schedule announcements such as earning announcement, dividend payout, stock repurchasing, IPO etc. Whereas unscheduled announcements like rating and outlook changes have relatively received less attention. Lastly, few academic papers studying the influence of credit rating change of stocks in the Banking sector but not in Finance and Property Development. These sectors share common characteristics of using high leverage to do business. As debt considering is interest bearing debt, the impact of credit rating and outlook changes on the stock prices in these sectors may be more explicit than others. Since credit rating has directly affected the cost of debt, investors may perceive that this directly affects the fundamentals of the company. For instance, when receiving an upgrade, Banking and Finance business are able to borrow at the lower inter-bank rate or even issue the corporate bond with lower coupon rate but still obtain the same lending rate. For Property and Development, this event induces the lower cost of their project and lead to higher IRR in the investor perception.

Additionally, in Finance sector, when firms received higher credit rating, they will promptly announce the investor about this good news (e.g., Opportunity Day, Roadshow etc.) to inform their lower cost of capital in the future. This could be a good sentiment for the stock. Another interesting fact is that the price of some stocks in these sectors move correspondingly in the same direction as the credit rating and outlook changes. This incidence happens around the event we interested hence may this information can be used to utilize to achieve an abnormal return on a stock.

Literature Review

Various literature has attempted to find good indicators that can explain or predict the stock prices. Jeremy C. Goh and Louis H. Ederrington (1993) examined the reaction of stock prices with bond rating whether it be the news for stockholder or no news. They found a significant reaction when rating changes associate with deteriorating financial anticipation or view of business, but changes in a firm's leverage do not. Doron Kliger and Oded Sarig (2000) discovered that the information value of bond rating did not affect the firm value but affect the debt value of the firm when the credit rating agency announced a worse rating in such a way that the debt value increase and the equity value decrease. Womack (1996) found that changes in analysts' recommendation do not reveal additional information to the market to the extent of affecting the prices of stock. Barber et al. (2001) investigated that analyst tended to overwhelmingly recommend positive in their appraisal, noting that most analysts work for brokerage firms. Jegadeesh, Kim, Krische and Lee (2004) and Asa B.Palley, Thomas D. Steffen and X. Frank Zhang (2019) spotted that consensus analyst target prices and analyst recommendation is an inconsistent predictor of future stock prices and return. Additional analyses guess this phenomenon caused by sluggish in analyst forecast to reflect bad news.

Plentiful papers study the impact of credit rating on the stock prices and provide mixed evidence on its reaction to rating change. Dichev and Piotroski (2001), Jorion et al. (2005), and Jorion and Zhang (2007), Heejin Yang, Hee-Joon Ahn, Maria H. Kim and Doojin Ryu (2017) found statistically significant stock prices reaction in either ways of credit rating changes announcement events (upgrade or downgrade). Meanwhile, Griffin and Savicente (1982), Holthausen and Leftwich (1986), Wansley and Clauretie (1985), Cornell et al. (1989) Hand er al. (1992), Goh and Ederington (1993,1999), Norden and Weber (2004), Li et al. (2006) and Kim and Nabar (2007) and several other academic literatures found that the stock prices react negatively and significantly to bond rating downgrade event, unlike the reaction to upgrade event which is statistically insignificant.

Moreover, recent research included studies of the information content of rating outlook and watchlist impact on bond price in the bond market. Hill et al. (2010) revealed that rating outlooks are even better predictors of sovereign rating

changes than watchlist. Koresh Galil and Gil Soffer (2011) explored the CDS market's reaction to credit rating and outlook announcement event and show that CDS spreads abnormally move in contrast direction of rating and outlook changes. Chung et al. (2012) adopted an event study using credit rating agency's press releases about rating reviews (e.g., credit watch action) and conclude that rating reviews convey valuable information to the market.

Finally, related literature examined the effect of credit rating changes on the stock price in a particular sector or class of common stock. Marwan M. Abdeldayem and Ramzi Nekkhili (2016) and Angeline Ng and M. Ariff (2019) conducted the test on banking, service, industrial and Islamic securities and found significant cumulative abnormal return around the period that credit rating events occur. Tripti Tripathi (2017) studied the impact of credit rating changes on stocks prices in India market, especially in the banking sector, and he found no sign of average abnormal return for most of the days of rating change announcement, however, the result cannot be generalized because it based on small sample size (26 events).

Data

Credit rating data and outlook changes used in this analysis were collected from the announcement by two credit rating agencies in Thailand—Tris and Fitch rating Thailand. The sample of data was gathered from 2002 until 2020. The credit rating and rating outlook can be illustrated by the following symbols: AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-, BB+, BB, BB-, B+, B, B-, CCC+, CCC, CC, C and D from the highest creditworthiness to the lowest, respectively. BBB- and above are referred to as investment-grade bonds, while issues rated BB+ and below are considered a speculative or high yield bond. Events considered must adhere to the following criteria: (i) firm must be listed in the Stock Exchange of Thailand and its bond must be issued and registered in the Thai Bond Market Association (ii) in case credit rating and outlook change simultaneously, the change of credit rating will dominate the rating outlook and hence exclude rating outlook from our sample. (iii) observations categorized as rating affirmations, new rating, or withdrawal are excluded from our sample.

In this study, we use the adjusted daily stock price from Bloomberg terminal and SET total return index as a benchmark (THSETRI).

Table 1 full sample distribution by year

	Upgrade	Downgrade	Positive outlook	Negative Outlook	Total
2002	4	0	0	0	4
2003	1	0	1	1	3
2004	10	1	7	0	18
2005	12	0	4	4	20
2006	8	2	2	1	13
2007	7	2	1	9	19
2008	9	1	4	1	15
2009	2	2	3	6	13
2010	8	2	10	6	26
2011	13	6	9	7	35
2012	2	3	7	8	20
2013	12	4	11	5	32
2014	8	1	5	10	24
2015	6	2	7	10	25
2016	12	8	3	5	28
2017	8	6	10	8	32
2018	8	8	5	10	31
2019	18	12	11	19	60
2020	3	36	16	40	95
Total	**151**	**96**	**117**	**149**	**513**

According to above criteria, we can extract a full sample of 513 events that compose of 247 credit rating changes (151 upgrades and 96 downgrades) and 266 rating outlook changes (117 positive and 149 negatives)

Table 2 events distribution by sector

	Upgrade	Downgrade	Positive outlook	Negative Outlook	Total
Banking	29	2	13	12	56
Finance & Securities	25	8	13	21	67
Property Development	25	22	26	35	108
Others	72	64	65	81	282
Total	**151**	**96**	**117**	**149**	**513**

Biggest contribution comes from Property Development sector that accounts for 21.05% of our full sample. From the table, it is noteworthy that these three sectors (Banking, Finance and Property Development) together make up almost half of the full data sample.

Table 3 Banking, Finance and Property Development sectors distribution by year

	Upgrade	Downgrade	Positive outlook	Negative Outlook	Total
2002	4	0	0	0	4
2003	0	0	0	0	0
2004	7	0	3	0	10
2005	7	0	2	3	12
2006	3	2	1	1	7
2007	5	0	1	3	9
2008	6	1	2	0	9
2009	1	1	2	2	6
2010	4	2	4	1	11
2011	6	0	3	6	15
2012	2	1	3	2	8
2013	2	3	9	4	18
2014	3	0	1	4	8
2015	1	1	4	7	13
2016	12	3	2	2	19
2017	4	1	4	4	13
2018	3	3	4	2	12
2019	9	2	3	14	28
2020	0	12	4	13	29
Total	**79**	**32**	**52**	**68**	**231**

Methodology

Most of methodology adopted in this study follow the information asymmetry and

investor trading behavior around bond rating change announcements from Heejin Yang, Hee-Joon Ahn, Maria H. Kim, Doojin Ryu (2017)

Research Design

The adjusted daily prices of stocks in SET index during 2002-2020 are taken from the Total Return Index Gross Dividends (TRI) by using Bloomberg terminal to calculate the return of each stock. The credit rating and outlook changes are gathered from Tris and Fitch rating Thailand. We classify the credit event into two groups—good (upgrade or positive in outlook) and bad (downgrade or negative in outlook). We apply the same process for both full sample and sub-sample (sectors) data. The stock returns are collected within the pre-defined window periods around the announcement date. The observation period on the effect of credit rating and

outlook changes is -5 to 63 days which day 0 designate the day that the credit changes events occur and the day in the window period are counted as a trading day. We rearrange samples into one independent observation (event window) to standardize the data.

Abnormal returns are calculated by subtracting normal return from their corresponding total returns. We use the OLS market model discussed in J. Brown and B.Warner (1984) to estimate the theoretical normal return of stocks in SET sample.

$$AR_{i,t} = R_{i,t} - \alpha_i - \beta_i[R_{M,t}]$$

$AR_{i,t}$ is the abnormal return for observation on day t. $R_{i,t}$ is the daily total return of each observation on day t. $R_{M,t}$ is the daily total return of SET index on day t. α_i and β_i used in this model is evaluated by running regression analysis between individual stock total return and SET index total return during days -252 to days -6 before credit events appear to obtain beta during normal circumstance and cycle. We then compute the cumulative of abnormal return in each event. Abnormal return is accumulated from day -5 to 63, resulting in the cumulative abnormal return of the sample data. The test of statistical significance is conducted on six-periods: -5 to -1, 0 day, 1 day, 1 to 5, 1 to 21 and 1 to 63 days. The CAR_i demonstrates the level of change in abnormal returns pre- and post-announcement of the credit rating or outlook changes date.

$$CAR_i = \sum_{i=1}^{n} AR_i$$

In this step, we regress CAR_i with the regression equation as shown below in the following section.

Statistical Approach and Hypothesis Development

To test whether the credit rating or outlook changes have impact on stock prices, the regression is employed. To test whether CAR_i of good credit events (upgrade or positive in outlook) is significantly positive, CAR_i of bad credit events (downgrade or negative in outlook) is significantly negative and to test whether of these two types of credit events are significantly difference. We use the regression equation as shown below. $\boldsymbol{Good_i}$ is the dummy variable taking the value 1 for upgrade or positive in outlook change announcement event i.

$$CAR_i = \beta_0 + \beta_1 \boldsymbol{Good_i} + \varepsilon_i$$

Null hypothesis (H_0) and Alternative hypothesis (H_1) are set up as shown.

For upgrade or positive in outlook of rating event.

H_0: No positive cumulative abnormal return is observed in stock prices around the good credit rating event.

H_1: Positive abnormal return is observed in stock prices around the good credit rating event.

H_0: $\beta_0 + \beta_1 \leq 0$, H_1: $\beta_0 + \beta_1 > 0$

For downgrade or negative outlook of rating event.

H_0: No negative cumulative abnormal return is observed in stock prices around the bad credit rating event.

H_1: Negative cumulative abnormal return is observed in stock prices around the bad credit rating event.

$H_0 : \beta_0 \geq 0$, $H_1 : \beta_0 < 0$

To test whether two types of credit rating event are significantly difference.

H_0: No significant difference in means of two types of credit rating event good and bad is observed.

H_1: Significant difference in means of two types of credit rating event good and bad is observed.

$H_0 : \beta_1 = 0$, $H_1 : \beta_1 \neq 0$

In this paper, we further explore the effect of credit rating and changes in outlook events in Banking, Finance and Property Development sectors. These sectors, which by nature use high leverage to do their businesses especially interest-bearing debt, may face greater impact of credit rating and outlook changes on the stock prices as changes in credit events directly affect cost of debt of these businesses. We want to test whether the abnormal returns of stocks in these 3 chosen sectors respond to credit rating and outlook changes announcement as predicted. Null hypothesis (H_0) and alternative hypothesis (H_1) are stated as shown below. To test whether $CAR_{i,3sector}$ of good credit events (upgrade or positive in outlook) is significantly positive, $CAR_{i,3sector}$ of bad (downgrade or negative in outlook) credit events is significantly negative and to test whether of these two types of credit events are significantly difference. We use the regression equation as shown below. $\boldsymbol{Good_i}$ is the dummy variable taking the value 1 for upgrade or positive in outlook change announcement event i.

$$CAR_{i,3sector} = \beta_{0,3sector} + \beta_{1,3sector}\boldsymbol{Good_i} + \varepsilon_{i,3sector}$$

For upgrade or positive in outlook of rating event.

H_0: No positive cumulative abnormal return is observed in stock prices around the good credit rating event.

H_1: Positive abnormal return is observed in stock prices around the good credit rating event.

$H_0: \beta_{0,3sector} + \beta_{1,3sector} \leq 0$, $H_1: \beta_{0,3sector} + \beta_{1,sector} > 0$

For downgrade or negative outlook of rating event.

H_0: No negative cumulative abnormal return is observed in stock prices around the bad credit rating event.

H_1: Negative cumulative abnormal return is observed in stock prices around the bad credit rating event.

$H_0 : \beta_{0,3sector} \geq 0$, $H_1 : \beta_{0,3sector} < 0$

To test whether two types of credit rating event have significant difference.

H_0: No significant difference in means of two types of credit rating event good and bad is observed.

H_1: Significant difference in means of two types of credit rating event good and bad is observed.

$H_0 : \beta_{1,3sector} = 0$, $H_1 : \beta_{1,3sector} \neq 0$

We want to further investigate about the effect of credit rating or outlook change on CAR_i to understand whether the CAR_i generated is due to stocks being belong to the 3 sectors or it is due to the specific firm characteristics that caused it. So, we add control firm variables along with the dummy for the Banking, Finance and Property Development sectors to test the CAR_i when credit events occur. We employed regression equation as shown below.

$$CAR_i = \beta_0 + \beta'_0 . \boldsymbol{3sector_i} + \beta_1 . \boldsymbol{Good_i} + \beta'_1 . \boldsymbol{Good_i} \cdot \boldsymbol{3sector_i} + \beta_2 \boldsymbol{Size_i} + \beta_3 \boldsymbol{Book\ to\ market\ ratio_i} + \beta_4 \boldsymbol{ROA_i} + \beta_5 \boldsymbol{Lev_i} + \varepsilon_i$$

Variable Definition and Explanation

$Good$: is the dummy variable taking the value 1 for upgrade or positive in outlook change announcement event i.

$3sector_i$: is the dummy variable taking value 1 when the corresponding stock is listed in Banking, Finance or Property Development for event i.

$Size_i$: is the control variable denoting the firms size measured by taking the log of market capitalization. Rajan and Zingales (1995) found that the larger firm transfer the greater information to investor than small firm so the firm size may have positively affected to cumulative abnormal return of stock prices.

$Book\ to\ market\ ratio_i$: is the control variable signifying firm's book value divide by market value. Lakonishok, Shleifer, and Vashny (1994) reported that book to market ratio has strongly correlated with the stock's future performance. Stock with high book to market ratio earned higher return than low book to market ratio stock, so the book to market ratio may have positively affected to cumulative abnormal return of stock prices.

ROA_i: is the control variable stand for net profit return divide by book value of firm's assets. Chinpiao and An-Sing (2015) spotted that Investors always seek to optimize their investments. A higher profitability stimulates investors to buy more share so the ROA may have positively affected to cumulative abnormal return of stock prices.

Lev_i: is the control variable measured by total debt divided by equity. Zmijewski and Hangerman (1981) and Leftwisch (1981) discovered the higher in leverage ratio leads the firm to have a greater probability of default, in this case the debt may have negatively affects to cumulative abnormal return of stock prices. However, using more debt could be a good signal for investors that firm will have a better performance in the future which will may have positively affected to cumulative abnormal return of stock prices.

To test whether the cumulative abnormal return of stocks in 3 sectors is still significantly greater than stocks in other sectors during upgrade or positive in outlook of rating event.

H_0: The cumulative abnormal return of stocks in 3 sectors is not greater than the cumulative abnormal return of stocks in other sectors during upgrade event.

H_1: The cumulative abnormal return of stocks in 3 sectors is greater than the cumulative abnormal return of stocks in other sectors during upgrade event.

$H_0 : \beta'_0 + \beta'_1 \leq 0$, $H_1 : \beta'_0 + \beta'_1 > 0$

To test whether the cumulative abnormal return of stocks in 3 sectors is significantly lower than stocks in other sectors during downgrade or negative in outlook of rating event.

H_0: The cumulative abnormal return of stocks in 3 sectors is not lower than the cumulative abnormal return of stocks in other sectors during downgrade event.

H_1: The cumulative abnormal return of stocks in 3 sectors is lower than the cumulative abnormal return of stocks in other sectors during downgrade event.

$H_0 : \beta'_0 \geq , H_1 : \beta'_0 < 0$

Pre-announcement period: During in the pre-announcement period, we expect that the stock price may slightly increase and decrease in respond to good and bad credit events announcement, respectively. Angeline and Ariff (2019) studied the stock prices reaction with credit rating events and discovered that investors initially pay little attention to speculate about the news on the firm in pre-announcement period. Another evidence is about information leakage that can lead to movement in stock prices before credit rating events occur. Stickel (1986) investigated the stock prices movement prior credit rating changes events were published and found that there are some information leakages prior to the announcement. Some investors received insider information and this information is a factor in the abnormal returns before the official released. And Irvine, Lipson and Puckett (2007) studied stock performance and spotted that high abnormal trading volumes and abnormal returns happened five days prior a buy recommendation released; thus, this expects investors received insider tipping.

1 day: Most of credit events announcements were announced by credit rating agencies after the stock market was closed. We expect to see both significant positive and negative of abnormal return on good and bad credit rating events. Goh and Ederington (1993) examine the reaction of stock returns to bond rating changes and found that bond rating changes partially reflect some insider information which is still not publicly available at the moment. These could be signals of changes in the company fundamentals, future earnings, trend of the industry, and ultimately the stock prices.

Post-announcement period: On this period, we anticipate seeing continuing in up and down trend of stock abnormal returns that reflected from change in credit rating events. Angeline and Ariff (2019) studied the stock prices reaction with credit

rating events and discovered investors have more confidence and have received additional information after announcement date of credit rating or changes in outlook events. As a certification of the issuer's credit quality were announced, hence investors do not need to panic and have reliance about direction of firm credit status.

Empirical Findings

Table 4 The stock prices reaction to credit or outlook changes – full sample.

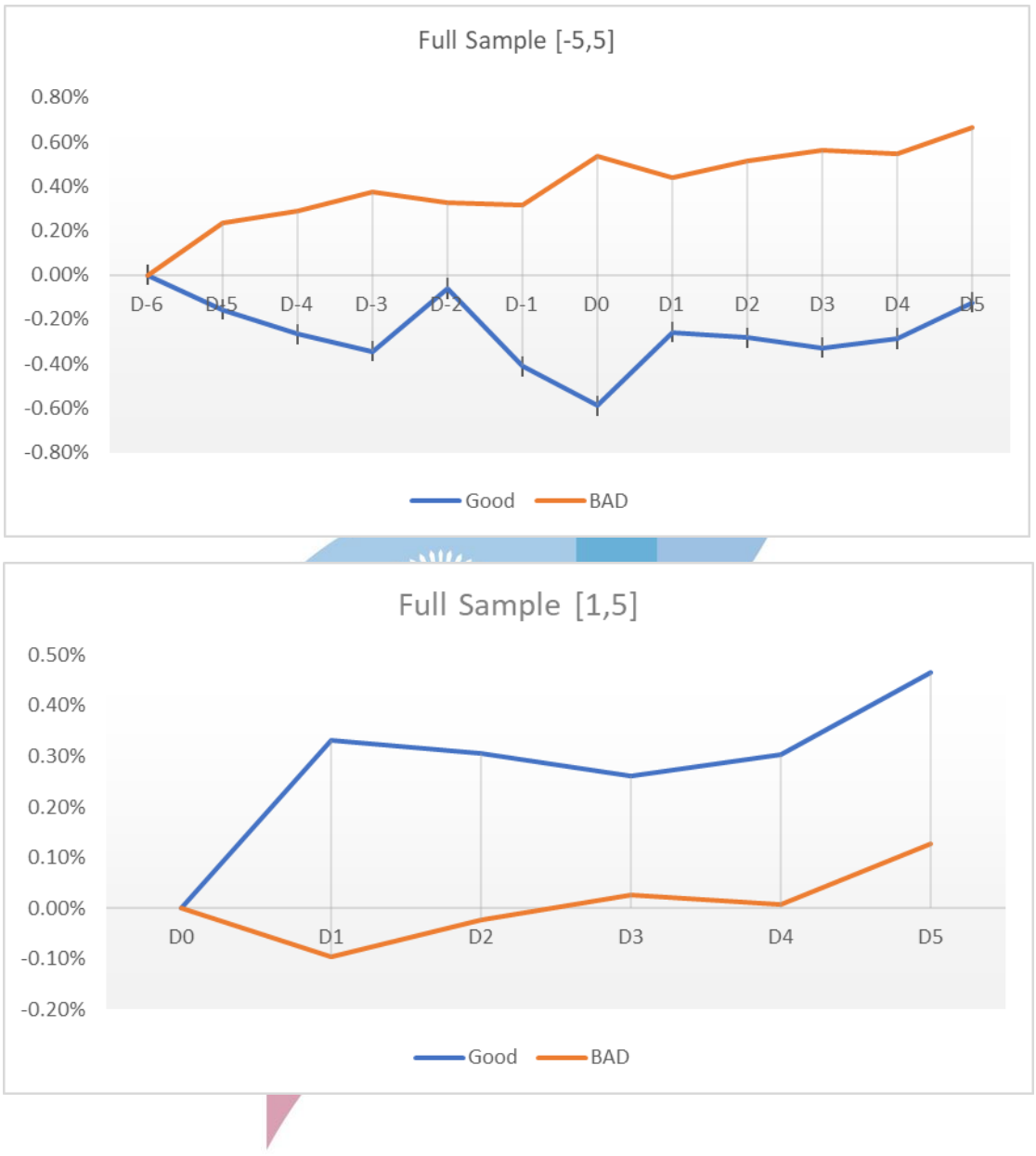
Good (Upgrade or Positive in outlook)		
Event window (days)	**full sample (N=513)**	
	Coef.	**t-stat**
[-5,-1]	-.0041247	-1.55
[0]	-.0017662	-1.16
[1]	.0033178***	2.48***
[1,5]	.0046453**	1.61**
[1,21]	-.0046659	-0.77
[1,63]	-.0289628	-2.71
Bad (Downgrade or Negative in outlook)		
Event window (days)	**full sample (N=513)**	
	Coef.	**t-stat**
[-5,-1]	.0031558	0.74
[0]	.0022063	1.12
[1]	-.0009571	-0.55
[1,5]	.0012704	0.31
[1,21]	.0039342	0.47
[1,63]	.0452049	2.99

Difference in means between Good and Bad event - full sample.		
Event window (days)	**full sample (N=513)**	
	Coef.	**t-stat**
[-5,-1]	-.0072804	-1.45
[0]	-.0039725	-1.59
[1]	.0042749**	1.95**
[1,5]	.0033749	0.67
[1,21]	-.0086001	-0.83
[1,63]	-0.0741677***	-4.00***

Note. This table presents the stock market response to credit event announcements. N denotes the number of observations. t-stat is a t-statistic based on the cross-sectional robust standard error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

To test whether the credit or outlook change events impact to the stock prices, the CARs are estimated for the full sample (general stocks) of good credit events (upgrade or positive in outlook) and bad credit events (downgrade or negative in outlook) from 2002-2020. Table 4 shows that the positive abnormal return of the stock occurs in some windows after the announcement of the good credit rating event. CARs are statistically significant for good credit event, but not at all for bad credit event. Around the event period (days +1 and days +1 to +5), CARs are positive with statistically significant at the 1% and 5% level respectively, which indicate that the good news of credit event announcements conveys the positive information to the market and incorporates into the stock prices. And difference in mean of CARs between good and bad credit event are significant at the 5% level on days +1 after the credit event announcement. The impact of good credit event on abnormal return of stocks disappears on any longer windows including window of a month after and window of a quarter after the announcement (days +1 to +21 and days +1 to +63). Surprisingly, we found significant difference in mean between CARs of good and bad credit event group, but in the opposite direction that we expected, on days +1 to +63 with statistically significant at the 1% level.

Figure 1 Cumulative Abnormal Return from days -5 to days 5 [-5,5] and Cumulative Abnormal Return from days +1 to days +5 [1,5] – full sample.



From figure 1 on event window days -5 to +5 graph illustrates that before the credit event announcement date CAR of good credit event is less than CAR of bad credit event, but in the statistically significant period on days +1 to +5 graph, we found that CAR of good credit event has significant positive and greater than CAR of bad credit event. CARs of good and bad credit event trend to increase which CAR of good credit event consistent with our hypotheses, but not for CAR of bad credit event.

Table 5 The stock prices reaction to credit or outlook changes – 3 sectors (Banking, Finance and Property Development)

Good (Upgrade or Positive in outlook)		
Event window (days)	**3 sectors (N=231)**	
	Coef.	**t-stat**
[-5,-1]	-.0045764	-0.78
[0]	-.0006054	-0.24
[1]	.0048255***	2.64***
[1,5]	.0108678***	2.30***
[1,21]	.0088153	0.93
[1,63]	-.0087146	-0.57

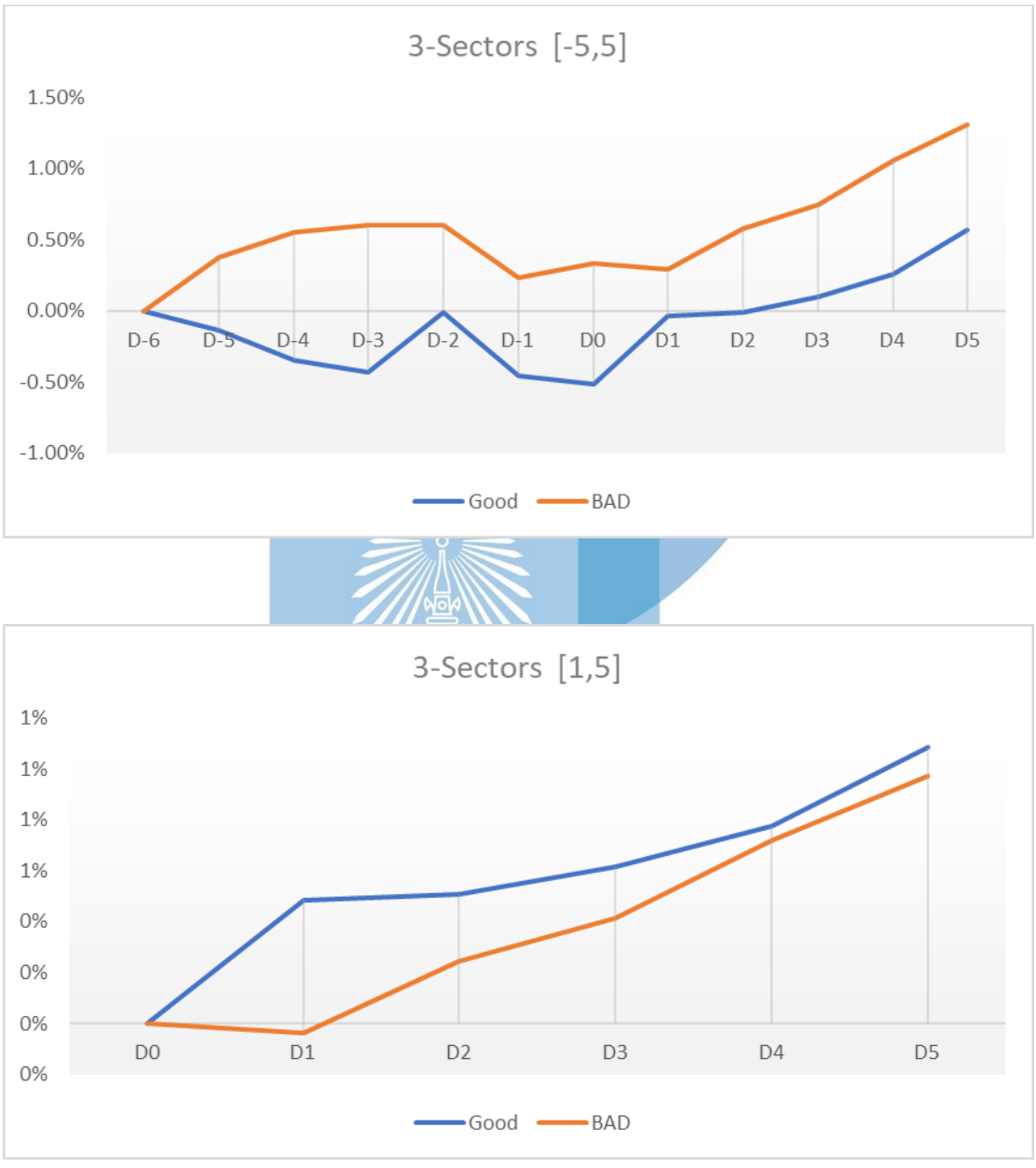
Bad (Downgrade or Negative in outlook)		
Event window (days)	**3 sectors (N=231)**	
	Coef.	**t-stat**
[-5,-1]	.0023133	0.30
[0]	.0010293	0.28
[1]	-.0003982	-0.15
[1,5]	.0097098	1.39
[1,21]	.0092532	0.66
[1,63]	.0262615	1.22

Difference in means between Good and Bad event - 3 sectors		
Event window (days)	**3 sectors (N=231)**	
	Coef.	**t-stat**
[-5,-1]	-.0068896	-0.78
[0]	-.0016347	-0.37
[1]	.0052237**	1.63**
[1,5]	.001158	0.14
[1,21]	-.0004379	-0.03
[1,63]	-.0349762*	-1.32*

Note. This table presents the stock market response to credit event announcements. N denotes the number of observations. t-stat is a t-statistic based on the cross-sectional robust standard error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5 presents the cumulative abnormal return of stock in 3 sectors (Banking, Finance and Property Development) for both pre-event and post-event periods. CARs were statistically significant only in the good credit event (upgrade or positive in outlook). Around the event period (days +1 and days +1 to +5), CARs are positive with statistically significant at the 1% level, and difference in mean was found in days +1 event period with statistically significant at the 5% level. The impact of good credit event on abnormal return of stocks no longer appear for period a month and a quarter after announcements (days +1 to +21 and days +1 to +63). On the contrary, we found significant in difference in mean between CARs of good and bad credit event group on days +1 to +63, again in the direction against what we expected, with statistically significant at the 10% level. From Table 4 and Table 5 provide evidence that the impact of credit events may be more explicit on the stocks in 3 sectors than general by looking at greater coefficient after good credit event announcements occur. To point out the economic significance at day +1 in good credit event, we found about 0.48% of abnormal stock return. If you have balance portfolio or multi-asset class portfolio, 0.48% is the return of Thai's government bond with 3-year maturity. During day +1 to +5, we found about 1.08% of cumulative abnormal stock return that equals to the return of Thai's government bond with 6-year maturity. On day +1 in good credit event, the difference in CARs between general stocks and stocks in 3 sectors is roughly 0.15% that equals to 1 year term-spread of Thai's government bond.

Figure 2 Cumulative Abnormal Return from days -5 to days 5 [-5,5] and Cumulative Abnormal Return from days +1 to days +5 [1,5] – 3 Sectors sample.



From figure 2 on event window days -5 to +5 graph illustrates that before the credit event announcement date CAR of good credit event is less than CAR of bad credit event, but in the statistically significant period on days +1 to +5 graph, we found that CAR of good credit event has significant positive and greater than CAR of

bad credit event. CARs of good and bad credit event trend to increase which CAR of good credit event consistent with our hypotheses, but not for CAR of bad credit event.

In this section, we study the cross-sectional variation of CARs around the credit event announcement dates to describe which firm characteristics are affect to CARs or it is the impact of credit event announcements and existing in 3 sectors. We also add interaction term between Good and 3sector so we can test the effect of existing in 3 sectors whether CARs of stocks in 3 sectors are greater(lower) than stocks in other sectors in good(bad) credit events. Where CAR (days +1 to +5) was employed because this window has strong statistically significant at the 1% level in both full sample and 3 sectors sample. The regression equation is shown below.

$$CAR_i = \beta_0 + \beta'_0 . \boldsymbol{3sector_i} + \beta_1 . \boldsymbol{Good_i} + \beta'_1 . \boldsymbol{Good_i} \cdot \boldsymbol{3sector_i} + \beta_2 \boldsymbol{Size_i} + \beta_3 \boldsymbol{Book\ to\ market\ ratio_i} + \beta_4 \boldsymbol{ROA_i} + \beta_5 \boldsymbol{Lev_i} + \varepsilon_i$$

Table 6 Cross-sectional analyses of excess stock return

Cross-sectional regression analyses [1,5]		
	full sample (N=513)	
	Coef.	**t-stat**
Intercept	-.0389721**	-1.72**
3sector (β'0)	.0127676	1.54
Good	.0079233*	1.39*
Good.3sector (β'1)	-.002134	-0.22
Size	.0023627*	1.34*
Book to market ratio	.0117722**	1.84**
ROA	-.0415669	-0.84
Lev	.0004772	1.25

$\beta'_0 + \beta'_1 > 0$ P-value = 0.0378**

Note. This table presents the stock market response to credit event announcements. N denotes the number of observations. t-stat is a t-statistic based on the cross-sectional robust standard error. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

We add control variables to see whether the positive impact of credit event on stock prices still exists even after accounted for variation of firm characteristics that could potentially affect stock price near credit event date. From table 6, we found that CARs of stocks in 3 sectors is significantly greater than stocks in other sectors during good credit event announcements at the 5% level, but we did not find evidence that CARs return of stocks in 3 sectors is lower than the cumulative abnormal return of stocks in other sectors during bad credit event announcements. Moreover, we found that the book to market ratio has positive and statistically significant at the 5% level on the cumulative abnormal return of stock which consistent with many studies reported that book to market ratio is strongly correlated with the stock's future performance. Stock with high book to market ratio earned higher return than low book to market ratio stock. And we found that Size has positive and statistically significant at the 10% level on the cumulative abnormal return of stock which also consistent with many papers stated that the larger firm transfer the greater information to investor than small firm. Lev factors quite affect CARs in the same way we predicted, but they are statistically insignificant. Because these factors could be differently interpreted by investors. For instance, increasing in leverage could be a good signal for future performance, so the manager does not want to dilute the shareholder power. While some investors could see the higher in leverage ratio leads the firm to have a greater probability of default, in this case the debt may negatively have effect to the cumulative abnormal return of stock prices. The result of ROA is not in line with our expectation and it is not statistically significant because ROA may not be a special information to make consideration by investors. To see profitability of the firm, may investors pay more attention to other profitability ratios than ROA.

The empirical result shows that good credit event announcements have impact on the stock price reaction in the window events we interested. Therefore, we suspect that the stock price reaction will depend on the magnitude of the rating change, whether credit rating event change with multiple steps will convey a stronger signal to the market than a single step and may lead to stronger price reaction of the stocks. We want to study whether around the good credit event

announcements, CARs of stock with multiple upgrades are greater than single upgrade. And around the bad credit event announcements, CARs of stock with multiple downgrades are less than single downgrade. Where CAR (days +1 to +5) was employed because this window has strong statistically significant. The regression equation is shown below.

$$CAR_i = \beta_0 + \beta_1 \boldsymbol{Good} + \beta_2 \boldsymbol{Good.MGood} + \beta_3 \boldsymbol{Bad.MBad} + \varepsilon_i$$

Variable Definition and Explanation

$Good$: is the dummy variable taking the value 1 for single upgrade of credit rating announcement.

$MGood$: is the dummy variable taking the value 1 for multiple upgrades of credit rating announcement.

Bad: is the dummy variable taking the value 1 for single downgrade of credit rating announcement.

$Mbad$: is the dummy variable taking the value 1 for multiple downgrades of credit rating announcement.

Table 7 Single and Multiple credit rating change.

Single and multiple rating change [1,5]		
	full sample - only rating change (N=247)	
	Coef.	**t-stat**
Intercept	.0071913	0.86
Good	.0004974	0.05
Good.MGood ($\beta 2$)	.0002212	0.02
Bad.MBad ($\beta 3$)	-.0062503	-0.29

$\beta_0 + \beta_1 > 0$ P-value = 0.0442**

We focus on β_2 which is difference in mean of CAR of stock between single upgrade and multiple upgrade event group and β_3 which is difference in mean of CAR on stock between single downgrade and multiple downgrade event group. Table 7 reveals that even we found statiscally significant of CAR in good credit event announcement, but we do not find a significant stronger stock price reaction for multiple upgrade than single upgrade event announcement. We do not find that bad credit event annoucements has significantly negative on CAR of stock regardless of whether they single or multiple downgraded. And we also found insignificant difference in mean of CAR on stock between single and multiple downgraded event group.

Conclusion

We study the reaction of stock prices in SET (The Stock Exchange of Thailand) with the credit event announcement whether these events impact the abnormal return of stock. We also further investigate in 3 sectors of stocks - Banking, Finance and Property Development. The empirical results reveal that, in full sample and in 3 sectors of stocks, CARs are significantly positive after the good credit events were officially announced, but we found insignificant after the bad credit event announcement. We add control variable to our regression to eliminate partially effect of other factors to focus on the effect of existing in 3 sectors. The result of examination shows that CARs of stocks in 3 sectors is significantly greater than stocks in other sectors during good credit event announcements, but we did not find evidence that CARs of stocks in 3 sectors is lower than the cumulative abnormal return of stocks in other sectors during bad credit event announcements. Moreover, we also found statistically significant book to market ratio and size effect. The larger book to market ratio or firm size, the greater positive abnormal return.

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