STOCK MARKET RESPONSES TO SOVEREIGN RATING ANNOUNCEMENTS: AN EVENT STUDY ON DIFFERENT COUNTRY GROUPS

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An Event Study on Different Country Groups

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DECLARATION OF ORIGINALITY

I, Oğuz Can Şahin, certify that

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- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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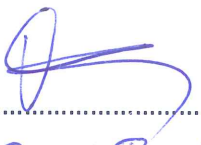

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ABSTRACT

Stock Market Responses to Sovereign Rating Announcements:

An Event Study on Different Country Groups

Credit rating agencies have gained significant importance in the last decades. Rating activities started with corporate bonds. Vast number of markets and tools are graded by agencies now. Many studies focused on corporate bond ratings and reaction of related stocks. Fewer studies investigated the relationship between sovereign credit ratings and country stock indexes. The thesis aims to measure the response of different index groups to sovereign credit rating announcements. Selected country groups are BRICS, developed markets economies and sub-segments of emerging markets. Response differences between mentioned groups are investigated in this study. 18 different indexes are included in the study. Period of the thesis is 01.01.2009 and 31.12.2018. Event study methodology is the used assessment technique in the study. The results underlined that there are significant returns for each of the selected groups. BRICS, developed market economies and investable emerging markets have significant abnormal returns during both upgrades and downgrades. Non-investable emerging markets and EU-member emerging markets had significant returns only during downgrades. On the other hand, Non-EU member emerging markets showed significant returns during upgrades.

ÖZET

Ülke Kredi Notu Duyurularına Hisse Piyasası Tepkileri: Farklı Ülke Grupları için Olay Analizi

Kredi derecelendirme kurulaşları, dünya genelinde artan yatırım seçenekleri ile birlikte gelen bilgi ihtiyacı nedeniyle son yıllarda kayda değer önem kazandı. Kurumsal tahvil değerlendirmeleriyle başlayan süreçte kredi derecelendirme kuruluşları bugün bir çok pazar ve yatırım aracı için not yayınlıyor. Literatürdeki bir çok çalışma kurumsal tahviller ve ilgili hissenin hareketlerine odaklandanan bir çok çalışma mevcut ancak ülke kredi notlarına ve endekslere odaklanan çok daha az çalışa bulunuyor. Bu çalışma farklı ekonomik gelişmişlik seviyelerinden hisse senedi piyasalarının ülke kredi notu açıklamalarına verdiği reaksiyonları ölçümlemek ve anlamaya çalışmaktadır. BRICS ülkeleri, gelişmiş ülke ekonomileri ve gelişmekte olan ülke pazarlarının alt grupları çalışmaya konu edilmiştir. Belirtilen gruplardan 18 farklı endeks çalışmada yer almıştır. Tezin periyodu 01.01.2009 ve 31.12.2018 tarihleri arasıdır. Olay Analizi Metodolojisi değerlendirmek tekniği olarak kullanılmıştır. Sonuçlar her bir grup için kayda değer beklenti üstü getiriler olduğunu ortaya koymuştur. BRICS ülkeleri, gelişmiş ekonomi pazarları ve yatırım yapılabilir seviyedeki gelişmekte olan pazarlar için hem not arttırımı hem de not düşürülmesi durumlarında belirgin abnormal getiriler gözlendi. Belirgin getiriler, AB üyesi gelişmekte olan ülkelerde ve yatırım seviyesi altı gelişmekte olan ülkelerde, sadece not düşürülmesi durumlarında, AB üyesi olmayan gelişmekte olan ülkelerde ise sadece not arttırımı durumlarında gözlemlenmiştir.

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CHAPTER 1

INTRODUCTION

> There are two superpowers in the world today in my opinion. There's the United States and there's Moody's Bond Rating Service. The United States can destroy you by dropping bombs, and Moody's can destroy you by downgrading your bonds. And believe me, it's not clear sometimes who is more powerful. (Thomas Friedman; February 13, 1996)

By definition, sovereign credit rating is the credit rating of a sovereign entity, such as a national government. The sovereign credit rating shows the riskiness of a sovereign entity to pay back its debt it indicates the risk level of investment in that country.

In an increasingly globalized world ecosystem, information need has become vital for borrowers and lenders in money transactions. Lenders want to gather information about the borrower, regardless of their existence type –individual, corporation or governmental unit-. Lenders are seeking to know about the borrower's current financial position and financial prospects and the borrowers "track record" with respect to past obligations, etc.; this information collection would be an effort to deal with potential problems of adverse selection (Lawrence J. White, 2013).

Following the first Credit Rating announcement of Moody's in 1909, Credit Rating Agencies (CRAs) have become rapidly a major influencer in the financial markets and in real sectors through their impact in financial markets. The Credit Rating Agencies' ratings are seen as the leading indicator of relative creditworthiness of institutions today. The effects of credit rating announcements over stock markets have been widely discussed until today. Credit rating agencies' extensive information about the financial risk of sovereigns is very valuable for corporations and

individuals that are investing in that particular country. Sovereign credit rating was first introduced in 1975 by S&P's and has become an important indicator of a country's default risk. A country's default risk is important because it directly affects the government's credit cost and availability. Mentioned problem does not only affect government but also individuals and corporations since increasing credit cost and decreasing credit availability lead to a credit shortage in that domestic market.

Sovereign credit rating announcements effect most of the financial markets due to their risk measurement function. Credit default swap (CDS), stocks and bonds can be named as the leading financial products that are affected from sovereign credit ratings. Even tough different sector stocks' respond relatively different to credit rating announcements, stock markets in general, respond to credit rating announcements directly. Financial sector companies (mainly banks or other money lending institutions) respond to credit rating changes strongly. Information inefficiency between borrowers and lenders creates a blur over investment tools. Credit ratings, support investors by carrying out information. Increasing importance of sovereign credit ratings is leading investors to wait and analyse possible outcomes of grade or sign changes.

Followill & Martell (1997) and Dichev (2001) showed out that a significant decrease is seen in stock prices after a downgrade of credit rating. On the other hand, the reviews also have a significant importance over stock prices. In this context, Norden & Weber (2004) showed that the review periods are leading to larger decreases than those observed at the time of actual downgrades. The main reason for this can be that the market is priced over expectations rather than actual happenings. On the other hand, Goh & Ederington (1993) showed that there is no significant increase in stock prices after a credit rating upgrade.

Reviews are creating an expectation in the market that makes the investors to evaluate their decisions according to the eventual outcome of a possible credit rating change. Accordingly in this thesis, the correlation between review and actual credit rating change is taken into account while looking for abnormalities during the credit rating changes.

The thesis is seeking to find the answers for following questions.

1) How do BRICS (a representative of emerging market economies) countries react to sovereign credit rating changes?

2) Are there any differences between responses of BRICS countries' and developed countries' indexes during credit rating events?

3) Are the different sub-segments of emerging markets responding differently to credit rating events?

a) Can being a part of EU (financial support in other words) soften the effects of credit rating changes?

b) Do those countries, that have investable and non-investable credit ratings, give different responses to credit rating upgrades and downgrades?

First question aims to answer whether stock prices of BRICS countries can be anticipated with the credit rating announcements or not. The timing of the stock prices' response to the credit rating announcements is also another indicator that is taken into consideration. Answer of this question aims to determine if stock markets react to the credit rating announcements before the event date (expectation) or the reaction starts after the credit rating announcement (realization). The second question seeks an answer for the highly debated approach of credit rating agencies as some find them quite biased. Many researchers investigated this topic to show results that

credit ratings are more biased towards developed countries. The third question is seeking for an answer to understand if the stock markets in different sub-segments of emerging markets respond differently to credit rating announcements. For this purpose, two different comparisons are employed in understanding the reaction of emerging markets. The first attempt is to understand if EU membership softened the effects of rating downgrades or not. Thesis assumes that during rating downgrades, these countries' stock markets react on a smaller scale when they are compared to non-EU emerging market countries. The second attempt is to analyse if there is a significant difference between the two other main segments of emerging markets i.e. those with investable grades and non-investable grades. Rating agencies assign more than 20 grades to sovereigns. At the end, these 20 grading levels can be grouped under two main categories as investable and non-investable. This thesis assumes that the rating changes have a smaller scale effect when the rating change is applied to an investable level graded market. As mentioned above, sovereign credit ratings can shortly be defined as "most commonly accepted risk indicator of default" for sovereigns. All four research questions collectively try to understand the overall impact of credit rating announcements on the stock prices using empirical evidence.

1.1 Stock market

The main goal of the financial markets is to fulfil the capital need of money seekers – borrowers – with money transfer from money givers –lenders- . Various instruments are traded globally in financial markets today. From future contracts to bonds or variants different investors are looking for earnings through the purchase of different financial products. Stocks are one of the most commonly used and invested financial assets among them all.

Stock markets can be can be categorized under two main groups. The first one is the organized stock market and the latter one is the OTC (over the counter) market. Organized (exchange) markets are highly regulated. Exchanges bring brokers and dealers together and all transactions are done through a centralized source. Centricity of stock exchanges are providing a stricter security. In contrast, over-the-counter markets are generally decentralized which means there is no mediator that is handling all transactions. Depending on this specification, OTC markets are generally seen as more flexible but it also brings additional security concerns for investors. Flexibility gives investors an opportunity for a higher return rate but on the other hand, market is more open to price manipulations. Risk of price manipulation is significantly low in organized markets when they are compared to over-the-counter markets.

Stock markets react to various signals. Main drivers that effect stock prices, are extendedly researched in literature. Announcements of corporate control, regulatory policy and macroeconomic conditions plausibly effect fundamentals (Cutler, Poterba, Summers, 1988). Macroeconomic news and indicators are seen as the major driver that leads stock prices up or down. Many studies researched the effects of macro-indicators on stock prices of both well-developed and emerging markets. Early studies generally focused on well-developed stock markets which then turned into emerging markets due to rapid capitalization of emerging countries. Li and Hu (1998) focused on response rate of four major stock indexes (S&P 500, Dow Jones, Russell 1000 and Russell 2000) to announcements of macroeconomic announcements such as inflation, money supply, employment, housing starts and state balances. Li and Hu's (1998) study showed the impact of macroeconomic news. Mentioned study did not only include effects of a set of real activities (industrial

production etc.) but also individual activities (M1, inflation rate) on equity prices in US. On the other hand empirical findings of several studies showed that macroeconomic indicators have even bigger impact over stock prices in emerging countries. Zakaria (2012) questioned relationship between volatility of stock market returns (Bursa Malaysia Composite Index) and volatility of macroeconomic factors (GDP, inflation rate, exchange rate, interest rates etc.) and found out that changes in macroeconomic factors represents a higher volatility in emerging markets.

1.2 Types of stocks

1.2.1 Preferred stocks

Preferred stock is a special hybrid type of financial resource. Preferred stock holders have claims on asset after the creditors but before the common stock holders. Even though a dividend payment is expected for preferred stocks, dividend payments are discretionary and are totally up to the decision of the board of that company. Board members may omit preferred stock dividends if they think it is necessary (Van Horne and Wachowicz, Jr., 2008).

One of the main features of preferred stocks is their cumulative dividends feature. This feature, which nearly all preferred stocks have, means that unpaid dividends are carried forward. Company first needs to pay dividends to preferred stock holders before making dividend payments to common stock owners.

Another main feature of preferred stocks is their participating feature. This feature, which is much less commonly seen in real market, means that a preferred stock holder may have the right to participate into the extra dividend of common stock owners according to a specified formula. Formula works if dividend per share

amount of common stocks exceeds the specified level of preferred stock dividend. In practice, general tendency in dividend distribution is that the dividends of preferred stocks exceed the value of the dividend that is distributed to common stock owners Hence participation is not likely to happen for preferred stock holders. On the other hand, it is not also possible for preferred stock owners to participate since preferred stock owners maximum expected return is limited to their specified dividend rate.

1.2.2 Common stocks

The common stockholders are the ones who are the ultimate owners of the company. (Van Horne and Wachowicz, Jr., 2008). Liability of the common stock owners are limited to their investment and they have the claim on asset after creditors and preferred stock owners in the case of liquidation. Common stocks do not have any maturity date but on the other hand stockholders may liquidate their investments by selling their stocks in the secondary market.

There are several terms which are commonly used for common stocks. Authorized share**;** is the total share that a company can issue at most without amending its charter. Since there is the need of shareholders to amend charter, companies generally prefer to hold some shares which are issued. There is also the need of approval from the regulatory institutions like Capital Markets Board in Turkey.

1.3 Pricing of stocks

There are several methods that are commonly used for pricing of stocks in market. Different studies examined strength and reliability of valuation techniques that are stated below.

1.3.1 Dividend discount model (DDM)

Every investor fundamentally makes a decision of spending current capital for deriving a rate of return in future. Investors mainly expect their return to exceed the inflation that will occur during the investment period. The margin between risk free return rate and investment's rate of return during the investment period is called risk premium. Initial investment at the beginning is known but future cash flows are uncertain. Depending on uncertainty, first step of investors when they are evaluating an option, is to predict the present value of future cash flows' (Chaplinsky & Harris, 2008). General formula of discounted cash flows is as follows:

$$V_0 = \frac{C_1}{(1+k_1)^1} + \frac{C_2}{(1+k_2)^2} + \cdots + \frac{C_n}{(1+k_n)^n}$$

Where:

V_0 : The current or present value of an investment

C_t : expected cash flows at time *t*

k_t : required rate of return for each period

n : number of periods

PV (stock) = PV (Expected future dividends, interest payments or earnings)

Dividend discount model is not accepted widespread by investors due to the complexity of calculating the required return rate (RRR). RRR has been one of the hardest variables to estimate. Various researchers studied on calculation of RRR, Eva Liljeblom and Mika Vaihekoski (2004) summarized main determinants of calculation method;

- Economy's real-risk free rate of return
- The expected inflation rate during investment period
- Risk rate of investment.

As it can be seen from determinants, RRR is determined by both systematic and unsystematic risk. Unsystematic risk which is related to stock itself, can be seen as relatively easier to calculate and eliminate since it comes from the financial and operational structure of company. On the other hand systematic risk brings more complexity into the table. Depending on that structure, systematic risk is the most dominant determinant of RRR. Elton and Grubber (1995), defined systematic risk as the only important ingredient in determining expected returns and non-systematic risk plays no role. In other words, according to Elton and Grubber's view investor is rewarded for bearing systematic risk. Systematic risk is formulized as following:

$$\text{Systematic risk} = \frac{\text{Cov (j,m)}}{\delta_m^2}$$

Where:

Cov (j, m) = Covariance between the security's return and the market.

δ_m^2= Market Variance

β = systematic risk

Therefore:

$$\beta_J = \frac{Cov(j,m)}{\delta^2}$$

After calculation of systematic risk as Beta, expected return of a stock investment can be calculated with using Capital Asset Pricing Model (CAPM) methodology.

$$E(R_j) = R_f + (R_m - R_f)\,\beta_j$$

Where;

$E(R_j)$ = Expected rate of return for stock

R_f = Risk free return rate

$(R_m\text{-}R_f)$ = Risk premium (Expected market return – Risk free rate)

β_j = systematic risk of stock *j*

In this equation market risk premium is weighted with systematic risk of stock. In economies with stable conditions, beta of stock will not be volatile with time. CAPM allows us to find an appropriate discount rate in order to calculate the net present value of the investment. CAPM includes some assumptions which cannot be realized in real world but it is still a viable point to use in investment evaluation. Dividend discount model is useful for valuation when economic environment is relatively stable and where assumption of a relatively constant growth for a long term is appropriate (Reilly & Brown, 2000).

1.3.2 Discounted cash flow model

Dividend, cash flow and earnings approaches are equivalent when payoffs are thought to be infinitive but in practice, payoffs are expected for a specific period of

time. Due to difference between hypothetical literature and real life practice, different valuation methods may lead to different outcomes for same company's stocks. Discounted cash flow model is an approach that is widely used by investors in order to valuate securities, projects, equities or even companies as a whole. First step of Discounted Cash Flow (DCF) calculation is the estimation of Free Cash Flow (FCF). Then equity's Weighted Average Cost of Capital (WACC) is used to calculate Present Value (PV). Current value level of equity is then determined by subtracting current debts of company from PV of FCF. This subtraction gives us the available cash flow for the investors. When we divide available cash flow by the outstanding shares, we will find the value of common stock price (Steiger , 2008).

As stated above DCF is commonly used by finance professionals due to its straight forward approach for the cash valuation. A survey among more than 30 Fortune 500 companies, %96 of corporations used DCF model to evaluate investment options (Bruner, 2007).

DCF method can be formulated as below:

FCF = EBIT (1-*t*c) + (Depreciation + Amortization) – Cash Flows from Capital Spending Cash Flows from Changes in Working Capital

EBIT = Total Revenue – Cost of Goods Sold (COGS) – Sales, General & Administrative Expenses (SG&A) – Other Indirect Expenses – Depreciation & Amortization

Cash Flows from Capital Spending = Purchases of Property Plant & Equipment (PPE) – Sale of PPE before Taxes + Taxes on Sale of PPE

Cash Flows from Changes in Working Capital = Increase (Decrease) in Accounts Receivable + Increase (Decrease) in Inventory + Decrease (Increase) in Accounts Payable

After calculation of FCF and the terminal value (V(T)), DCF model discounts every year's FCF by WACC of the company.

$$Company\ Value = \left(\frac{FCF_1}{(1 + WACC_1)}\right) + \left(\frac{FCF_2}{(1 + WACC_2)}\right) + \cdots + \left(\frac{V(T)}{(1 + WACC_n)}\right)$$

Where;

V(T) = Remaining cash flows at the end of the investment period.

In order to determine value of equity; current value of debt of the company is subtracted from the company value and the result is divided by total outstanding share numbers. Result of calculation is the value of a common stock.

After all analysis, accuracy of DCF heavily depends on financial analyst's capability of predicting future. %100 accuracy is a utopia since capabilities are not measurable or predictable. Naturally, DCF model usage is not the only guide during investment decisions.

All assumptions and other justifications that have been used during DCF model application, create uncertainty for investment decision. Some statistical models help investors eliminate uncertainty up to a level but it is not possible to come up with a %100 concrete answer. Utility approach supports investors for investment decisions by investigating the model according to risk averseness level of investor.

1.3.3 Earnings approach

DCF and DDM are absolute valuation models that attempt to find the true value of a common stock. They only take into account the details of mentioned stock –cash flows, WACC etc. - , on the other hand there is also relative approaches which functions by comparing similar company's stocks.

The P/E valuation method is one of the frequently used investment evaluation techniques. The main reason behind the popularity of the method is its explanatory capability over common stocks that do not have observable/measurable insights. As we have discussed earlier, absolute value calculation models include a significant amount of uncertainty because of assumptions. On the other hand, performance of relative benchmark models heavily depends on the quality of selection of comparable firms (Cheng and McNamara, 2000).

P/E valuation method can be formulized as below.

$$\overline{PE}_{it} = \text{median}_{j \epsilon \varphi it} \left\{ \frac{P_{jt}}{E_{jt}} \right\}$$

Where;

PE_{it} = the benchmark P/E multiple for the target firm *i* at time *t*

Median_j = Medians calculated over all firms *j* in the set of comparable firms for target firm *i*

P_{jt} = Firm *j*'s stock price at time *t*

E_{jt} = Firm *j*'s earnings at time *t*

After calculation of the multiplier;

$$\hat{P}_{it}^{P/E} = E_{it} x \overline{PE_{it}}$$

Where;

$\hat{P}_{it}^{P/E}$ = the estimated value of firm by P/E valuation method

E_{it} = earnings of firm *i* at time *t*

And the absolute value of prediction error;

$$u_{it}^{PE} = \left| P_{it} - \hat{P}_{u}^{PE} \right|$$

Prediction error needs to be scaled to control size in order to eliminate the size effects.

$$\frac{u_{it}^{P/E}}{P_{it}} = \frac{\left| P_{it} - \hat{P}_{it}^{P/E} \right|}{P_{it}} = \frac{\left| P_{it}/E_{it} - \overline{PE_{it}} \right|}{P_{it}}$$

The error measure is modified by adding the numerator to denominator for avoiding the extreme outliers that can cause significant problems,

$$e_{it}^{P/E} = \frac{u_{it}^{P/E}}{\hat{P}_{it}^{P/E} + u_{it}^{P/E}}$$

Where;

$e_{it}^{P/E}$ = Adjusted percentage absolute error for P/E valuation method (Cheng and McNamara, 2000).

P/E ratio is one of the most widely used multiples for valuation. However, there are a wide variety of multiples used e.g. sales multiple, EBITDA multiple. For

specific industries, specific multiples may also be very important. As the ARPU multiple in telecommunication

1.4 Credit rating agencies

1.4.1 Brief history of credit ratings

In the beginning, agencies developed credit ratings to measure how risky to lend money for money seeking companies in the market. This need started with the US Railroad Companies that started their business in the 1820s. U.S. economy and market structure were like none in the world in the first and second quarter of the 19th century. The country was like a huge construction facility. The country was a whole continent, and the major problem was the connectivity of all land. Railroads were the primary option for US. Railroad companies issued bonds to finance their expanding operations. During this period, private companies owned railroads. The pressure of expanding to "the wild west" was on the shoulders of private companies starting with the 1850s (Rudden, 2009). An operational expansion in that scale was huge when the desert-like middle part of the continent and the need for thousands of miles of the railroad are taken into consideration. Uncertainty of such a big investment came up with a giant capitalization need. Existing banks and credit institutions were not capable of lending that huge capital need. Railroad companies developed a company bonded debt market rapidly to solve capital problem.

The industry was huge. The railroad bonded debt market surpassed the size of Dutch, English or US sovereign debt bond markets in less than 60 years. The boom of the corporate bond market of railroad companies took the attention of transatlantic European investors (Standard and Poor's, n.d). Investors of Europe wanted to know

detailed information about the companies' financial capabilities. Traditional information gathering channels like brokers and lobbyists became insufficient. Investors were looking for a third party solution with an independent position.

Henry Varnum Poor took over a press named American Railroad Journal in 1849. Poor started to publish data about assets and financial situation (liabilities, earnings) of railroad companies. His systematic and continuous approach became so popular. After The Civil War, Poor and his son started their own press, Poor's Manual of Railroads of the United States. Published information was the primary data source of the industry for several decades. The base of today's credit rating industry follows back to this press. In 1909, another gentleman, John Moody came into the scene with publishing first assigned credit ratings of railroad companies (Moody's, n.d). Opinions were based on deep industry information from companies and statistical measurement. The Poor Company started to do the same in 1916. During the same period, Standard Statistics Company started to assign rating notes to corporate bonds in 1924. Later, Standard Statistics Company merged with The Poor Company to form The Standard and Poor's (Standard and Poor's, n. d). Other big and well-known rating agency, Fitch, started to assign credit ratings in 1924.

After the boom of the need for credit ratings, credit rating need started to live their second hype in the 1970s. A lot of small- and medium-sized credit agencies entered the market in the 1970s, under the increasing demand. Many companies established their credit rating business during the 1970s and 1980s from Canada to India. There are at least 60 credit rating agencies worldwide and it is hard to track them because of the continuous mergers, buyouts, etc. (Rudden, 2009).

When we look at the main reasons for the credit rating boom in the last quarter of the 20th century, we can underline 4 main reasons as the priority.

- The total required capital was excessive.
- Globalization came with specific needs. Because of the rapid globalization, the need for independent information became an obligation for investors. Limited knowledge about developing countries forced investors to seek a solution. Global investors criticized the trustworthiness of the local information providers. The need for a global-level information provider became vital for investors.
- The investor base was diversified. Today's investing ecosystem is not only about western countries. Investors from Middle-East, Far-East and other regions are seeking investment options from all over the world. Investment of a Chinese institution to an Indian bond is not even a piece of news nowadays. Such an increase in the variety of investors brought the need for a better knowledge and understanding of the dynamics of each market.
- The uniformity of rating systems is essential. There are endless combinations of more than a hundred countries with the high number of rated instruments. High variety brings comparability to the table as a primary problem. Depending on the huge number of rated objects, investment makers are asking for a worldwide structured system. So that, comparison of different options of different regions is possible with the same scale.

1.4.2 Determinants of Credit Ratings

In the last three decades, economies have had the highest number of ups and downs of the modern era. The cycle of the global financial crisis triggered a worldwide financial volatility. Asian Financial Crisis (1997-1998), Russia Debt Default (1998), Brazilian Crisis (1998-1999 and 2002), Turkey Crisis (2000-2001), Argentina Crisis

(2001-2018), US Subprime Mortgage Crisis (2007-2008), European Debt Crisis (2008-2013) played a crucial role (Chee, Nassir and Cheng, 2014). Recurring financial crisis showed that even sovereign debts are not “risk-free”.

Sovereign credit crises can cause wider problems to the macro-level financial market of the world. One country’s default of debt effects the world level economic growth. One of the most recent examples of the defined situation is sovereign debt fail of PIIGS countries (Portugal, Ireland, Italy, Greece and Spain). Debt failure slowed the economic growth of Euro Zone and also the global growth in the meantime.

Sovereign credit ratings have gained more importance in the last 30 years because of the impact of the sovereign debt problems. An extensive number of studies have focused on the impact of sovereign credit ratings over economies. Also, the determinants of sovereign credit ratings were a popular topic among researchers.

Cantor and Packer (1996) published the first systematic study that investigated the determinants of credit ratings (Josic and Mlinaric, 2018). Cantor and Packer (1996) selected eight indicators to identify their impact over credit ratings. Six of the eight determinants showed a significant impact on credit ratings. Sample of the study was 49 countries. Per capita income, GDP growth, inflation, external debt, level of economic development, and default history appeared to have an important role in credit ratings. But Cantor and Packer could find no significant impact of Fiscal Balance and Economic Balance on credit ratings. Following Cantor and Packer (1996), Afonso (2001) published his study that investigated determinants of sovereign credit ratings. The study focused on ratings of two major credit rating agencies (Moody’s and Standard & Poor’s). He conducted an 81 countries sample in 2001 and used a linear and a logistic transformation of rating scales. The variables

that researcher put into regression were GDP Per capita, external debt, level of economic development, default history, real growth rate and inflation rate. Results were in line with Cantor and Packer (1996) study. Afonso (2001) found that GDP per capita, GDP growth, inflation, external debt ratios, economic development, and default history have a significant impact on credit ratings. In particular, the study identified that GDP growth is the dominant variable for developed countries. However, the dominant variable is the debt ratio for the emerging markets. Afonso, Gomes, and Rother (2007) applied panel estimation and random effects ordered probit model. The study conducted a sample of 130 countries. Credit ratings of Big Three between 1995 and 2005 are used. The results of their further study were in line with Afonso's (2001) former study.

GDP per capita, GDP growth, governmental debt, government effectiveness indicators, external debt, external reserves, and default history appeared to have a significant impact over credit ratings. The study showed that not only macroeconomic indicators play a crucial role in credit ratings. Also governmental effectiveness has a significant impact. The study included World Bank's six main governmental effectiveness indicators:

- Voice and accountability
- Political stability
- Regulatory quality
- Rule of law
- Control of corruption
- Governmental effectiveness. (Afonso, Gomes and Rother, 2007)

After analysis, governmental effectiveness was the only significant one among all six indicators. Chodnicka-Jaworska (2016) analysed the determinants of

credit ratings for European countries. The author gathered data from World Bank and Thomson Reuters databases for the years between 1980 and 2015. The study included 44 countries. 44 countries divided into four sub segments according to their level of economic development. Four different variable groups tested all sub segments. Variable groups were macroeconomic variables (GDP per capita, real GDP growth, unemployment, inflation), government variables (government debt, fiscal balance, government effectiveness), external variables (external debt, foreign reserves, current account balance) and other variables (default history, European Union membership, and regional dummies). Results also showed that GDP growth is the strongest driver for developed countries. Also, external debt and foreign reserves have a significant impact. All studies mentioned above stated that GDP per capita, GDP growth, and external debt are significant determinants of credit ratings. Especially in the developed country ratings, macroeconomic indicators seem to have a great impact on credit ratings. Political factors have a greater impact in emerging markets compared to developed economies.

1.4.3 Sovereign credit rating critics on biased approach

Thanks to rapid globalization after the 1980s, sovereign credit ratings gained massive importance. Increasing the importance of sovereign credit ratings made researchers focus on the algorithm of sovereign credit ratings. One of the main criticisms for sovereign credit ratings is the misalignment. Many researchers think the credit ratings do not pay enough attention to financial or economic performance (Karakaş, Hisarciklilar, and Öztürk, 2011). Political factors that cannot be measured on a metric basis play a crucial role in the assignment of credit ratings for sovereigns. Many studies have focused on the issue by using comparative techniques. Studies

have investigated whether there is any difference between applied methodologies of developed and emerging countries.

Capital need is higher because of a higher growth target of emerging markets that leads to a need for a stronger and bigger financial reach. Because sovereign credit ratings affect credit capacity, rating changes are vital for emerging economies. Since all international funds ask a valid rating for allocation, especially ratings of the Big Three are valuable for emerging markets. Explained importance of sovereign credit ratings bring spotlights onto the objectivity of world-known agencies towards -riskier- emerging countries (Yalta and Yalta, 2018).

Studies state that credit rating agencies use a single approach regardless of country segments. However, several studies like Karakaş, Hisarcıklılar and Öztürk (2015) draw attention to different approaches towards different groups. Karakaş, Hisarcıklılar and Öztürk (2011) segmented countries into two segments as developed and low-and middle-income countries. Authors aimed to test the rating algorithm for developed and developing countries. The authors used two different estimation models. The study included credit ratings and indicator data from 1990 to 2010. The results showed that credit rating agencies lack a standardized approach towards developed countries. The findings stated that credit ratings can be caught by "the model" for developing countries. However, it is also seen that credit rating agencies' "rating method" is much more favourable towards developed countries.

Another study (Öztürk, 2014) focused on Governance Indicators of The World Bank that are listed below:

- Control of Corruption
- Voice and Accountability
- Political Stability and no violence

- Governmental effectiveness
- Regulatory quality
- Rule of law

The study included a sample of 514 observations of developed countries and 494 observations of developing countries. The period of the study is between 1999 and 2010. The study tries to predict sovereign credit rating for both groups by using the same model. The results showed that variation between the predicted credit rating and actual credit rating of developing countries is higher than developed-countries. The findings imply that credit rating agencies position themselves as more conservative. Agencies leave a bigger space to political indicators while rating the developing markets.

1.5 Efficient market hypothesis

The efficient markets hypothesis is one of the market models in financial studies. Paul Samuelson constructed the first version of the efficient market hypothesis, -like many other modern economy ideas- in 1965. Samuelson published ideas about price behaviours of markets where all data are available for every anticipator before event dates. In his "Proof that Properly Anticipated Prices Fluctuate Randomly" article, he stated in an informationally efficient market, price changes must be fully random.

In contrast to Samuelson's study, Fama (1970) defined an efficient market as a market where many investors -or profit maximizers- are battling for maximum profit depending on the all known information in that market. According to Fama (1970), if the price of an asset is under the necessary level, information holders will make purchases and increase the price of the asset until the expected level.

Researchers investigated EMH and developed various empirical models to test the hypothesis (Blume and Darlouf, 2007).

The basis of this thesis depends on the efficient market hypothesis and assumptions of the model. As explained in the previous sessions, the informative duty of the credit ratings is crucial to market players. Many new markets do not provide sufficient and publicly available information, so credit ratings guide investors. This function of credit ratings brings out the following question. Do credit rating announcements carry out new information about the market?

Many studies have announced evidences about that nearly all markets are inefficient (Yılmaz, 2014). This thesis investigates EMH by examining selected stock markets' anticipation type and level to credit rating events. It is fair to assume that markets will not perform a significant abnormal return if the market is efficient since credit rating cannot carry out new information in that case. Vice versa, the market reaction will take place in or after announcement day in case of an inefficient market. The main assumption here is that in an inefficient market, credit ratings carry out new information. On the other hand, the effects of credit rating announcements are linked to the content of credit rating announcements. The thesis expects to see larger adjustments during announcements with higher private information. However, a higher level of public information in a credit rating announcement leads to a smaller change in the market.

CHAPTER 2

REVIEW OF THE LITERATURE

All financial markets carry credit risk by nature. The credit risk carried out by assets like CDS, stocks and bonds affects prices. Different financial asset markets respond to credit rating announcements in a different way because of different market dynamics and investor behaviours.

Stock markets –by nature- are affected primarily from credit rating changes because of the variety of stocks from different sectors and their relation to credit risk. Initial studies about the relationship between stock markets and credit ratings started in 1970s. An extensive number of researches focused on the stock market and its sub-segments.

A summary of commonly referred studies about the stock market and credit rating announcement relationship is stated in Table 1.

A wide range of studies investigated the relationship between credit rating announcements and the stock market. Beginning from the 1970s, stock market investors started to evaluate their investment ideas according to credit ratings. Pinches and Singleton can be named as the first to publish a study that investigates that relationship, in 1978. The study comprised Moody's credit ratings for 207 firms for 23 years starting from 1959. Results showed that significant price changes are seen 30 months before to credit rating changes. There were no abnormal return when period of the following 12 months after the event date is observed.

Table 1. Summary of Literature Review

Type	Date	Author	Data	Main Findings
Corporate	1978	Pinches and Singleton	1959-1972, Moody's, 207 firms	Significant price changes are recorded 30 months before the rating event change.
Corporate	1986	Holthausen and Leftwich	1977-1982, S&P, 1270 credit events	Significant abnormal return for downgrades
Corporate	1986	Goh and Edherington	1984-1986, Moody's, 428 credit events	Significant response for downgrades, downgrades because of leverage changes do not cause negative abnormal returns.However, abnormal returns were seen if rating change occurred because of firms' cash flow or financial prospects
Corporate	1992	Holthausen, Hand, and Leftwich	1977-1982, S&P, 1350 credit events, U.S Market	Significant abnormal return for downgrades
Corporate	1997	Barron, Clare and Thomas	1984-1992, S&P, 87 companies, UK Market	Significant abnormal return for downgrades and positive credit watch announcements
Sovereign	2004	Brooks et al.	1973-2001, S&P, Moody's and Fitch, 69 countries, 621 rating changes	Significant abnormal return for downgrades
Sovereign	2007	Gama and Ferreira	1989-2003, S&P, 29 countries, 215 rating changes	Spill over effect of sovereign credit rating changes is recorded for upgrades
Sovereign	2014	Öztürk	1995-2007, S&P, Moody's and Fitch, Turkey, 36 changes	No significant effect of sovereign credit rating changes
Sovereign	2014	Kim, Hume and Hooper	1995-2003, S&P, Moody's and Fitch, 49 countries, 627 rating changes	Significant abnormal returns for USD-denominated stock market for downgrades
Sovereign	2014	Ftiti and Fatnassi	2008-2012, S&P, Moody's and Fitch, 4 countries, 196 credit rating changes	Significant abnormal return for downgrades
Sovereign	2015	Safari and Ariff	1998-2013, S&P, 9 emerging countries, 96 rating changes	Significant abnormal return for downgrades
Sovereign	2015	Bissoondoyal – Bheenick and Brooks	1975-2010, S&P, 33 countries	Significant abnormal return for downgrades
Sovereign	2015	Candeias	2009-2014, S&P, Moody's and Fitch, 5 countries, 126 credit rating changes	Significant abnormal return for downgrades and no spill over effect
Sovereign	2016	Abdelbayem and Nekhili	2000-2014, S&P, Moody's and Fitch, Kingdom of Bahrain	No significant abnormal returns
Sovereign	2016	Pedras	2006-2015, S&P, Moody's and Fitch, 12 western economies, 208 rating changes	Significant abnormal return for downgrades, S&P is the most significant
Sovereign	2017	Avcı and Gürsoy	2008-2016, S&P, Moody's and Fitch, Turkey, 23 rating changes	Significant abnormal return for downgrades

Holthausen and Leftwich (1986), conducted a study similar to Pinches et al. (1978). The study sought answers for the same question but included a bigger and deeper sample. The study comprised 1014 rating changes and 256 credit watches from S&P for the period of 5 years starting from 1977. The event window of the study started ten months before the event date and lasted two months after the event date. Findings showed that there were significant returns for negative rating downgrades and credit watches but there was no significant response from the stock market for positive rating announcements or credit watches.

Holthausen, Hand, and Leftwich (1992) published another study with US market data. 250 credit watch list actions and 1.100 credit rating announcements made by Standard and Poor's were in the sample. Authors looked to the data between 1977 and 1982 for credit rating announcements. However, they used data on credit watch list actions between 1981 and 1983, because "Standard and Poor's" started to credit watch list additions in 1981. The study reached similar findings with previous research. Holthausen, Hand, and Leftwich found significant excess returns for rating downgrades and no significant excessive returns for upgrades. Another important finding was that the credit watch list additions also caused excessive returns. The event window of the study started 11 days prior to the event date and lasted 60 days after the event date.

Goh and Ederington (1986) also investigated the relationship between market returns and credit rating announcements. The study included 428 rating changes for the period of two years starting from 1984. They established the model after dividing rating announcements into three main sub segments which are;

- Improvement or deterioration in the firm's cash flow, financial prospects, performance

- Changes in the firm's leverage,
- Miscellaneous or no reason was given.

Authors used the event study methodology with an event window starting 30 days before the event and lasted 30 days after the event date. Results showed that there were significant abnormal returns only at downgrades. There were no significant return at downgrades that depends on changes in firms' leverage. However, abnormal returns were seen if rating change occurred because of firms' cash flow or financial prospects. The second one relates to the "expectation" of Moody's and the first one relates to the actual information. The difference between two supports the idea that the market adjusts itself according to possible moves before the event.

Barron, Clare and Thomas (1997) published their study about stock market and credit rating correlation for the UK market. Most of the previous studies used the US as the market. The study was a pioneer in that manner. There were credit ratings of 87 publicly traded companies in the sample for the period of 8 years starting from 1984. The event period started from 30 days before the event and lasted 30 days after the event date. Like the successors, the study came up with results that state significant negative abnormal returns for rating downgrades. There were no abnormal returns at positive credit rating events. But the study reported positive abnormal returns when companies gets into the credit watch list.

Brooks et al. (2004) published their study that is one of the most cited ones in credit rating-market impact relationship topic. Until that day as stated above studies focused on corporate-level credit rating changes and their impacts. Brooks et al. took it to the whole market level by using sovereign credit ratings instead of using corporate bond credit ratings. The authors used data of Standard & Poor's, Fitch and

Moody's from 1973 to 2001. The study included 69 countries and 621 sovereign rating changes. The results showed similarities with previous studies in the literature. The findings reported no significant returns at upgrade events. On the other hand, there were significant negative returns at downgrade events. The study also differentiated itself by measuring the impacts of rating agencies separate from each other.

Gama and Ferreira (2007) published their study about the discussed topic. Their data consisted of sovereign credit rating of 29 countries from 1989 to 2003. Authors preferred S&P ratings in the study. There were 215 rating changes in that period for selected sovereigns. Gama and Ferreria focused to see spill over effects of credit rating announcements in neighbour country. As a summary of findings, there was a spill over effect at rating upgrades in neighbour economies. There was asymmetric spill over at rating downgrades. A possible cause of spill over effect was noted as the economic closeness of neighbour countries due to high trade levels.

Öztürk (2014) from Bülent Ecevit University, published her study about the impact of sovereign credit rating announcements on stock returns and exchange rates. The study considered Turkey as the research area. The period of research was between 1995 and 2007. Turkey faced 14 upgrades and 9 downgrades along with 13 outlook changes during the selected period. The results stated that there was no significant impact on the stock market before or after rating upgrades. There was only a very small impact during downgrade events. The study reports no significant relationship between credit rating events and stock markets.

Kim, Hume, and Hooper (2014) published the study that investigates the relationship between credit ratings and the stock market. The study examined sovereign credit rating changes in 49 countries between 1995 and 2003. Authors used

Standard and Poor's, Fitch and Moody's credit rating announcements. There were 627 sovereign credit rating changes in the studied period. The study asked if credit rating announcements were providing new information to stock markets or not. The expectation was that if credit rating events carried new information, a post-event date abnormal return would occur. Authors have used an event window of 7 days before the event and 7 days after the event. Findings revealed that sovereign credit rating changes have a significant impact on the volatility of USD-denominated national stock markets.

Ftiti and Fatnassi (2014) published their study that investigated the relationship between stock market returns and sovereign credit ratings. Data of the study covered Portugal, Spain, Italy and Greece. The authors included 196 sovereign rating change observations for the period of 2008 to 2012. The authors used sovereign rating changes of Standard and Poor's, Fitch and Moody's. Results were in line with previous studies. Negative announcements have a significant negative impact on stock markets. Results also showed that rating agencies behaved to support markets during crisis periods.

Bissoondoyal – Bheenick and Brooks (2015) published the study to test the same sample with different models. Authors used the market model, the quadratic model, the downside model, and high-order downside model. Data in the article covered the period of 1975 to 2010. Study included rating changes of 33 countries from Standard and Poor's. Results supported previous studies of literature. The study reported that downgrades cause significant negative abnormal returns before and after the rating changes. Also, the study showed that measurement of abnormal returns does not change according to models.

Candeias (2015) published his article about a very similar subject to Ftiti and Fatnassi (2014)'s. Data of the study consists of sovereign rating changes of Fitch, Standard and Poor's and Moody's. The study included 126 rating changes between 2009 and 2014. There was a total of 126 rating changes during the mentioned period. As a summary, the study stated that downgrades have a more significant impact than upgrades. The reaction of the market varies between countries. The reactions of the stock markets differ for each agency. There is no spill over of rating changes between selected countries.

Abdelbayem and Nekhili (2016) extended the literature about the relationship between credit ratings and stock markets. Authors selected Kingdom of Bahrain for the investigation. Since the topic is new to areas like Bahrain, the paper brought a new way of look to literature. The authors applied an event study methodology. Event study had an event window that started from 20 days before the event and lasted 20 days after the event date. The number of observations is pretty limited for recent years so there were only 2 downgrade announcements in the study. As the result of the study, significant returns were measured before the announcement. However, no significant results after the actual announcement.

Pedras (2016) published his thesis on the impact of sovereign credit rating changes on the stock market of 12 western economies. The study comprised Standard and Poor's, Moody's and Fitch rating changes for the period of 2006 to 2015. There were 208 announcements during this period (including outlooks). Like previous studies, results showed that rating upgrades have no significant impact on returns. On the other hand, downgrade events caused significant negative abnormal returns. The study reported that most significant abnormal return observations are in S&P rating announcements.

Avcı and Gürsoy (2017) have one of the most recent studies on this topic. The authors used event study methodology to see the impact of credit rating announcements on the national stock market. The study included Turkey as the research market and covered the period between 2008 and 2016. There were 23 rating changes in Turkey from Standard and Poor's, Moody's and Fitch. The study showed that impact was significant for downgrades like successors. There was no significant impact of upgrades in the Turkish market.

CHAPTER 3

RESEARCH METHOD

3.1 Research objective

As stated in the previous sections, credit ratings and market reactions have a tight correlation. Many studies investigated the relationship between corporate bond credit ratings and stock market returns. However, studies that focus on sovereign credit ratings are very limited (Brooks, et al., 2004). Researchers started to study sovereign credit ratings' impacts in the last decade. Though we cannot still say that there are many studies investigated the subject in a detailed way.

This thesis aims to investigate the stock market reactions of different group countries. Main target is to understand the different impact of credit rating changes across different countries. Countries with similar specialities comprised country groups. Economic structure is used as the leading indicator for grouping countries. The study will also allow us differences between countries from the same segment. Comparing such groups according to their characteristics has not been done until today, to the best knowledge of the author. The thesis included rating changes of Standard and Poor's, Fitch and Moody's. These three agencies account more than %90 credit rating industry (Bartels and Artium, 2015).

The thesis plans to reach to research objective by finding answers for the following questions for the period between 2009 and 2019:

Research question 1:

How do BRICS countries react to sovereign credit rating changes? BRICS countries are a good representative of emerging markets. Five countries weights more than %70 of the economic size of the whole emerging markets. Including all emerging countries may cause several variations. Small sized emerging markets face many rating events in short periods that can cause a heterogenic sample. Another reason is the spill over effect among geographically close countries. Adding too many countries from same region may deviate results. The last reason is concentration risk that may occur for the countries from same region. Asian crisis is a good example for this since general impact over all countries in that region. Thesis included BRICS countries to eliminate above problems.

Research question 2:

Is there any difference between market responses of BRICS countries and developed countries to credit rating changes? Many researchers discussed the biased approach of credit rating agencies towards developed countries. The thesis will compare samples from both developing and developed countries. Research question two aims to find an answer to this question. Tendency between two groups helps to understand if the market players value credit rating changes with the same weight. The thesis expects that if there is a bias towards developed countries, abnormal returns will be less significant for this group. The main idea behind the assumption is that investors will not take action to rating changes if they contrive that there is a bias in the model.

Research question 3:

Is there any significant difference between the market responses of different sub groups of emerging markets? There are two questions under this research question. First one is as follows:

"Invisible hand" protection of big EU countries for on-the-edge of default economies of Europe is an on-going discussion. A question arose from the discussion. Is being part of EU softened effects of credit rating changes in EU emerging markets? The main idea behind the assumption is that EU member emerging economies do not have the stock market response at downgrade events as significant as other emerging economies. Study took Greece, Hungary, and Poland as representative of EU member emerging markets. Sample of Non-EU member emerging comprised Turkey, Brazil and Colombia.

Credit rating agencies have more than 20 rating levels. In the end, all rating levels can be grouped to two main levels. These two groups can be named as investable and non-investable sovereigns. The second question arose from defined separation. Is there any difference between the market responses of two groups? Does a rating fall from A+ to A cause the same impact compared to a fall B+ to B? Do countries with lower ratings get more damage during downgrades? Greece, Turkey, and Brazil are selected as representative of non-investable grade emerging economies. On the other hand, Hungary, Russia, Colombia, and Poland are selected as the representative of investable grade emerging market economies.

Event study methodology is used in this thesis. Many researchers preferred the method in previous studies. Using the financial data, an event study measures the impact of a specific event on the value of an asset (MacKinlay, 1997). Like many other techniques that are used to measure the effects of events on selected assets,

event study methodology requires a pre-defined time horizon (MacKinlay, 1997). The period of the thesis is between 2009 and 2019. Conceptual framework that has been developed for the thesis can be seen in Figure 1.

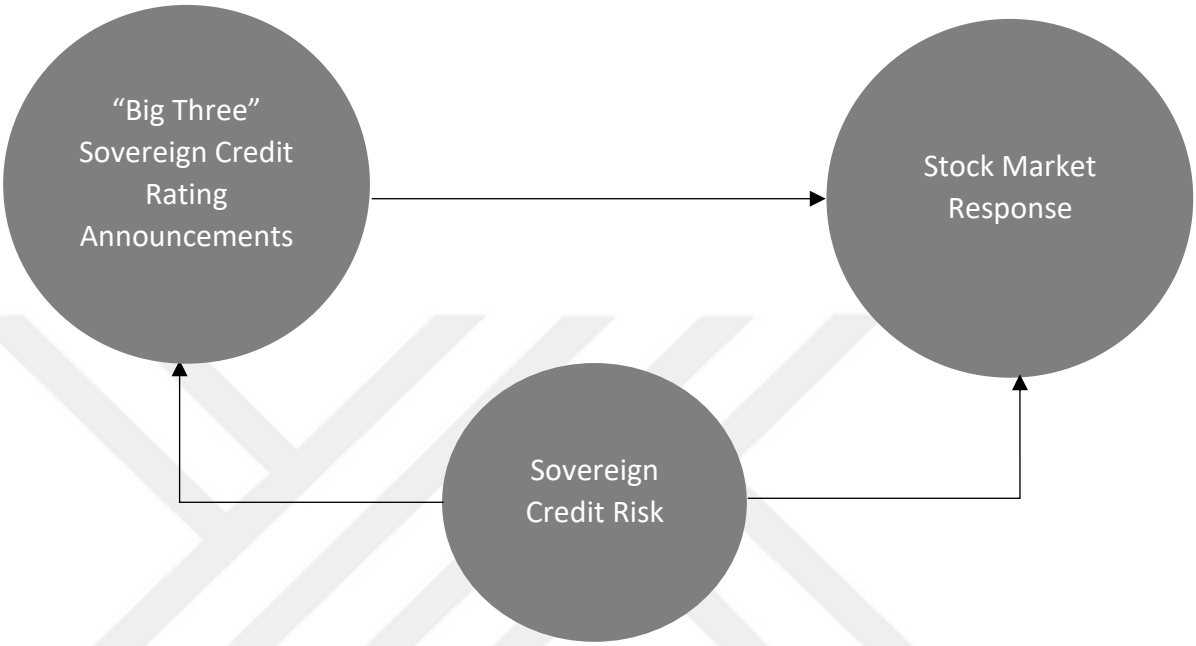

Figure 1. Conceptual framework

3.2 Event study methodology

Event study methodology aims to calculate the economic impact of a particular type of event (Yılmaz, 2014). Fama (1969) is the pioneer of the usage of event study methodology with the form of today. Fama (1969) investigated stock split events in her research. Following the study, the method gained importance day by day. The main idea of the method is to compare abnormal results with expected results (the result that will occur in the absence of event) in the event period. The main assumption behind the method is that financial markets respond efficiently to publicly available data (MacKinlay, 1997).

There are three periods in an event study. Their names are the estimation window, the event window, and post-event window. The estimation window is the time duration that takes place before the event window. The estimation window is event-free and is the source of the data for benchmark return calculation. The event window is the defined period that includes the time that the event occurs. The event window can start either before the event or at the time event occurs and goes afterward. The post-event window is an optional period. The post-event window can be used to observe changes after the closing of the event window (MacKinlay, 1997). A simple timeline can be seen in Figure 2 that visualize the flow of time windows.

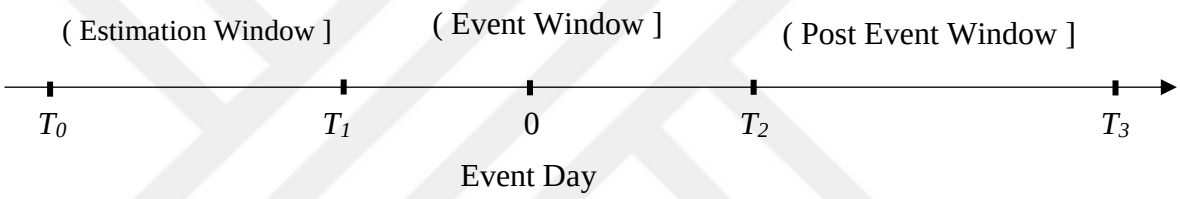

Figure 2. Timeline of an event study

Studies state that there are four main techniques used in the event study methodology to calculate the expected returns. Capital Asset Pricing Model (CAPM), the Market Model (MM), Mean Adjusted Returns Model (MAR), Market Adjusted Returns or Index Model (IM). CAPM has been the most popular one in the literature recently. Many authors like Brooks (2004), Candeias (2015) and Avcı (2017) used CAPM to calculate the market return. The CAPM approach allows us to calculate the daily observations of abnormal returns. The model enables us to calculate the expected results from the data gathered from the estimation period.

Bowman (1983) and MacKinlay (1997) defined the five steps of the event study procedure. Following the foot-prints of the successors, this thesis includes own version of event study steps. The five steps of the calculation are listed below.

Step 1: Event identification:

Sovereign credit rating announcements of "Big Three" (Standard and Poor's, Fitch and Moody's) have been used as events. The actual day of the rating announcement is used as t=0. The study includes all three types of rating announcements which are named as rating change, outlook and credit watch. The selected period of the events is between 2009 and 2019. 18 indexes from developed and developing economies that take place in the thesis are listed in Table 2.

Step 2: Calculating abnormal returns

The conventional market model is used to calculate the daily risk-adjusted abnormal returns.

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

Where:

AR_{it} > Abnormal return on market *i* at day *t*

R_{it} > Return on market *i* at day *t*

R_{mt} > Return on MSCI EM Index or MSCI WI *i* at day*t*

α_i, β_i > Market Model Parameters from LOS Regression

The market model parameters are calculated for each market "*i*" by daily observations of 60 days. The estimation window starts from 80 days before the event date and ends at 21 days before the event date.

Step 3: Standardizing abnormal returns

The event window of the thesis starts 10 days before the event date and ends at 11th day after the rating announcement. After calculation of abnormal returns for each day

in the event window, taking the average of abnormal returns is the next step. Test statistics of the 1991 study of Boehmer et al. are used like most of the successors focused on the same topic. Risk-adjusted abnormal returns are standardized as following:

$$SAR_{it} = AR_{it} / \hat{\sigma}_i \sqrt{1 + \frac{1}{T_i} + \frac{\left(R_{mt} - \overline{R}_m\right)^2}{\sum_{E=-80}^{-21} (R_{mt} - \overline{R}_{m)}{}^2}}$$

Where:

σ_i > Standard deviation of market *i*'s risk adjusted abnormal stock returns during the estimation period

T_i > the number of trading days in the estimation period of country i

$\overline{R}_{\text{m}}$ > average benchmark market return during the estimation period

Step 4: Calculating volatility

Next step is the calculation of cross-sectional standard deviation of SARs. The cross-sectional standard deviation of SARs shows volatility for each day in the event period.

$$\hat{\sigma}_{SAR_t} \sqrt{\frac{\sum_{i=1}^{N} (\, SAR_{it} - \sum_{i=1}^{N} SAR_{it} \,/\, N\,)^2}{N(N-1)}}$$

Step 5: Testing the significance of standardized abnormal returns

Formula of the test statistic to see the statistical significance of SARs is as following:

$$Z = \frac{\sum_{i=1}^{N} SAR_{it} / N}{\hat{\sigma}_{SAR_t}}$$

3.3 Data and descriptive analysis

The thesis comprises 18 indexes from different regions and economic groups. Daily observation of market returns between 01.01.2009 and 31.12.2018 are used for each index. A total of 27.216 daily market return observations are used. 336 events are recorded as available in the defined period. Data of stock the markets and event dates are collected from Bloomberg Terminal and official websites of stock indexes. The list of all stock indexes can be found in Table 2.

Table 2. Selected Stock Indexes

	Country	Stock Index
Benchmark Index	Developed Markets	Vanguard FTSE Developed Europe Index
Benchmark Index	Emerging Markets	MSCI Emerging Markets Index
	United States	DJI
	Hong Kong	HSI
	Netherlands	N100
	France	CAC40
	Spain	IBEX35
	Italy	FTSEMIB
	Brasil	BVSP
	Russia	MOEX
	India	NSEI
	China	SHCOMP
	South Africa	FTSEJSE
	Turkey	BIST100
	Greece	FTSEATHEX
	Hungary	FTWIHUNL
	Colombia	COLCAP
	Poland	WIG30

Overlapping events were extracted from the study to eliminate the correlation failures. An event is only taken into the thesis, if there is no other estimation or event window located in the same period.

There are four main country groups in the thesis. BRICS, Non-Investable Emerging Markets, Investable Emerging Markets and Developed Markets. The selection criteria of developed and emerging markets is MSCI's market classifications. MSCI's market classification can be seen in Table 3.

Table 3. MSCI Market Classification Table

Source : MSCI Web Site

The two other groups are investable and non-investable emerging markets. Selection criteria for mentioned groups are the grading levels of "Big Three" agencies. Countries that have investable level grades from at least from two of the agencies are accepted as investable. Countries that have only one or less investable level grades from Big Three are accepted as non-investable. Sovereign rating scales of "Big Three" can be found in Table 4 and Non – Investable and Investable emerging markets can be seen in Table 5.

Table 4. Credit Rating Scale of Big Three Agencies

S&P	Moody's	Fitch	Description
AAA	Aaa	AAA	Prime
AA+	Aa1	AA+	
AA	Aa2	AA	High grade
AA-	Aa3	AA-	
A+	A1	A+	
A	A2	A	Upper medium grade
A-	A3	A-	
BBB+	Baa1	BBB+	
BBB	Baa2	BBB	Lower medium grade
BBB-	Baa3	BBB-	
BB+	Ba1	BB+	
BB	Ba2	BB	Non-investment grade
BB-	Ba3	BB-	
B+	B1	B+	
B	B2	B	Highly speculative
B-	B3	B-	
CCC+	Caa1		Substantial risks
CCC	Caa2		Extremely speculative
CCC-	Caa3	CCC	
CC	Ca		In default with little prospect for recovery
C	C		
D	/	DDD	In default
	/	DD	
		D	

Source : White, 2010

Table 5. Investable and Non Investable Emerging Markets

Non - Investable Emerging Markets	Investable Emerging Markets
Brasil - BVSP	Russia - MOEX
Turkey - BIST100	Hungary - FTWIHUNL
Greece - FTSEATHEX	Poland - WIG30
	Colombia - COLCAP

After defining different groups, event dates are defined. Since each group's observed number of upgrades and downgrades have at least 30 events, we do accept them as normally distributed (Brooks et al. 2004). The distribution of each groups' observed events is listed in Table 6.

Table 6. Distribution of Credit Ratings

BRICS	Downgrade	Upgrade	Total
Brazil	17	9	26
Russia	14	9	23
India	3	5	8
China	5	3	8
South Africa	17	4	21
Developed	Downgrade	Upgrade	Total
United States	6	4	10
Hong Kong	5	4	9
Netherlands	5	4	9
France	10	2	12
Spain	19	13	32
Italy	18	3	21
Non-Inv.	Downgrade	Upgrade	Total
Brazil	17	9	26
Turkey	14	13	27
Greece	19	16	35
Invest.	Downgrade	Upgrade	Total
Russia	14	9	23
Hungary	13	13	26
Colombia	4	12	16
Poland	4	5	9
Sub-Total	35	39	74
TOTAL	148	107	255

Source: Bloomberg Terminal and Official Websites of Credit Rating Agencies

Distribution of events shows that credit rating changes are more frequent in developing markets. Countries like Spain and Italy faced very frequent rating changes during recession period. On the other hand, China and India have faced very few credit rating changes in the last 10 years, even they have been considered as emerging markets. Greece was the only country that got a default rating between 2009 and 2019. The country had the highest volatility in rating changes.

There are three main tools that credit rating agencies use as rating changes. First is giving a letter change to sovereign credit risk (for instance changing from BB to BA). Second one is outlook change of sovereign credit risk (for instance changing

from BB- to BB). Outlook changes give an idea about the long term opinion of issuer credit rating agency over the credit risk of rated sovereign. The last one taking a sovereign to watch list which is less frequent compared to first two options. Adding to credit watch list gives idea about a shorter term view of credit rating agencies over the selected sovereign. All three are used in this thesis. All events grouped either as positive or negative. Upward and downward revisions of credit rating agencies are defined as upgrades and downgrades.

CHAPTER 4

ANALYSIS AND RESULTS

Research questions of the thesis are answered trough following the defined steps of the event study. Definition of the events as the credit rating changes in selected market was the first step of the event study. The thesis accepted credit rating transactions of Moody's, Standard and Poor's and Fitch – also known as Big Three – as events. Three event types in the thesis are credit watch list additions, credit rating changes and rating outlook changes. The thesis does not give different weights to different event types since there is no significant clue in the literature that states any of the event types has stronger effects. The event window is defined as 10 days before and after the event date [-10,+10] for each event. The event windows only include working days. If there is a weekend or national holiday in that market in the event period, the thesis accepts the next working day as the next day. The estimation window is 60 days for each event. The estimation windows start 80 days before the announcements and end 21 days before the announcements [-21,-81]. The estimation windows are defined as above. The estimation windows include weekends and national holidays. Daily abnormal returns (AR) are calculated by using the market model as the next step for each day in the event window. ARs are expected to be equal to zero if there is no significant effect of defined events. The data of 18 indexes are used to see reactions of markets that belong to different economic development levels. 16 of the selected 18 indexes are national stock exchanges. The other 2 are multi-country benchmark indexes. "MSCI Emerging Market Index" is used as the benchmark of expected market return for emerging market economies. The main

reason for the usage of the index is its broad coverage of 25 emerging market economies. The index includes stock markets from different geographical regions like Asia-Pacific, Europe, Middle East, and America. "Vanguard Developed Europe ex. UK" index is used as the benchmark index for developed market economies. The reason behind the selection is that the index has all European market economies. Broad coverage of the index makes it a good candidate to be the representative for developed market economies. Countries from different geographical regions of the world is used in sampling in order to eliminate the possible spill-over effects. Regional recession periods can cause misleading results when many countries from one region are grouped. End of the day data of all indexes is used in terms of USD. The thesis uses USD-term index data instead of local currency to eliminate the volatility of different currencies from all over the world. "α" and "β" parameters for daily risk-adjusted abnormal returns are calculated by the least ordinary square regressions for each estimation period. "α" is the interception point of regression and "β" is the X-Variable from the regression. The third step was the calculation of standardized risk-adjusted abnormal returns like former studies of Boehmer et al. (1991) and Brooks (2004). Then cross-sectional standard deviation of standardized abnormal returns is calculated for each day. As the final step, the test value is calculated to see the statistical significance of standardized abnormal returns of each day. The null hypothesis to test is that stock indexes will have zero abnormal returns if credit rating changes do not have any impact on market prices.

Different groups that are mentioned above have different reactions to credit rating announcements. 10 Day event window has been used for all of them by accepting Brooks et al. (2004) as the benchmark. Tables 7, 8, 9, 10, 11 and 12 show reactions and their significance for all four groups

Table 7. BRICS Countries Reaction to Credit Rating Changes

BRICS	Upgrade				Downgrade			
Day	SAAR	t-stat	CAR	t-stat	SAAR	t-stat	CAR	t-stat
10	-0.37734	-1.59	-0.37734	-1.53	0.079078	-0.26	0.079078	0.59
9	-0.1491	-0.21	-0.52643	-1.56	0.164195	0.87	0.243273	1.36
8	0.174253	0.77	-0.35218	-0.90	-0.21898	-1.21	0.024294	0.37
7	-0.21561	-0.96	-0.56779	-1.27	0.166079	0.53	0.190373	0.79
6	-0.39051	-1.51	-0.9583	-1.92	0.275795	0.41	0.466168	1.30
5	-0.03054	-0.10	-0.98884	-1.86	-0.02065	0.12	0.445521	1.17
4	0.062916	-0.10	-0.92593	-1.59	-0.28083	-1.58	0.164688	0.51
3	0.002403	0.32	-0.92352	-1.49	0.056719	0.21	0.221406	0.59
2	-0.24202	-0.91	-1.16554	-1.80	0.054408	-0.31	0.275815	0.65
1	-0.08049	-0.36	-1.24604	-1.84	0.058503	0.70	0.334317	0.71
0	0.434439	2.04**	-0.8116	-1.13	-0.18529	0.08	0.149031	0.38
-1	0.171371	1.06	-0.64023	-0.85	0.12668	0.37	0.27571	0.57
-2	-0.04468	-0.32	-0.6849	-0.88	-0.19799	-0.98	0.077722	0.25
-3	-0.14494	-0.53	-0.82984	-1.02	0.085081	-0.40	0.162803	0.37
-4	-0.01741	-0.02	-0.84725	-1.00	0.40856	1.27	0.571363	0.92
-5	-0.38881	-1.97	-1.23606	-1.42	-0.35332	-2.39**	0.218039	0.41
-6	0.16665	0.93	-1.06941	-1.20	-0.07368	0.14	0.144364	0.31
-7	-0.28063	-1.09	-1.35004	-1.45	0.007038	-0.67	0.151401	0.31
-8	-0.3606	-1.53	-1.71064	-1.80	0.048012	-0.63	0.199413	0.36
-9	0.237698	1.31	-1.47294	-1.51	0.042637	0.91	0.24205	0.40
-10	-0.23837	-1.19	-1.71131	-1.73	-0.14293	-1.78*	0.099124	0.22

df = 55 for upgrades df = 29 for downgrades * denotes signifance at %10 ** denotes significance at %5

Results showed that BRICS countries have significant abnormal return on the event date at upgrade events. Significant abnormal returns were seen before the event date during downgrades. Many studies in the literature found out significant abnormal returns for stock markets only at downgrades. The results are in conflict

with Safari and Ariff (2015). The highest average abnormal returns were seen on the days with significant abnormal returns.

Table 8. Developed Countries' Reaction to Credit Rating Changes

Developed		Upgrade				Downgrade		
Day	SAAR	t-stat	CAR	t-stat	SAAR	t-stat	CAR	t-stat
10	-0.228	-1.39	-1.259	-1.94	0.135	1.71	0.135	-0.33
9	-0.084	-0.52	-1.031	-1.57	-0.083	-0.72	0.052	-0.63
8	0.092	0.36	-0.947	-1.45	0.096	0.99	0.148	-0.45
7	0.397	1.34	-1.039	-1.56	0.075	0.73	0.223	-0.68
6	-0.276	-1.22	-1.436	-2.02	0.091	0.73	0.313	-0.84
5	-0.068	-0.28	-1.160	-1.96	-0.060	-0.52	0.253	-1.02
4	-0.335	-1.25	-1.093	-1.70	0.228	1.57	0.481	-0.89
3	0.082	0.57	-0.758	-1.48	0.080	0.59	0.561	-1.42
2	-0.171	-0.67	-0.840	-1.50	0.064	0.53	0.625	-1.69
1	0.255	1.88*	-0.670	-1.42	0.047	0.26	0.673	-1.78
0	-0.197	-1.24	-0.925	-1.80	-0.159	-1.57	0.514	-2.15
-1	0.004	0.02	-0.728	-1.58	-0.177	-1.52	0.337	-1.84
-2	-0.132	-1.07	-0.731	-1.78	-0.016	-0.15	0.321	-1.56
-3	-0.181	-0.93	-0.599	-1.34	-0.024	-0.17	0.297	-1.48
-4	-0.086	-0.40	-0.419	-0.96	0.050	0.51	0.348	-1.49
-5	0.018	0.11	-0.333	-0.87	0.069	0.79	0.417	-1.88
-6	-0.011	-0.03	-0.351	-0.83	-0.176	-1.74*	0.241	-2.45
-7	-0.327	-1.52	-0.340	-1.21	-0.139	-1.38	0.102	-1.78
-8	0.122	0.85	-0.013	-0.05	-0.110	-0.85	-0.008	-1.41
-9	-0.523	-2.49	-0.135	-0.46	-0.204	-1.95*	-0.147	-0.98
-10	0.388	1.92*	0.388	1.92	0.057	0.62	0.057	0.62

df = 62 for upgrades df = 29 for downgrades * denotes signifance at %10 ** denotes significance at %5

Developed countries had significant abnormal returns at downgrade and upgrade events. The result can be interpreted as both emerging and developed markets price expectations at downgrade events. On the other hand, developed countries have stock market reaction before and after the event date at upgrade

events. This finding is in contrast with the previous studies. Most of the previous studies found no evidence of significant abnormal returns at upgrade events. The main difference between BRICS countries and developed countries is the difference between the response levels. Even both groups have abnormal return during downgrades, developed countries had only ~-0.2 SAAR and while BRICS countries had ~-0.4.

Table 9. Investable – Emerging Market Countries Reaction to Credit Rating Changes

Investable	Upgrade				Downgrade			
Day	AAR	t-stat	CAR	t-stat	AAR	t-stat	CAR	t-stat
10	-0.320	-2.56	-0.383	-0.89	-0.116	0.50	1.161	1.08
9	-0.125	-1.01	-0.063	-0.53	-0.108	-0.44	1.277	1.04
8	0.087	0.82	0.062	-0.38	0.544	-0.87	1.385	1.12
7	0.172	0.75	-0.025	-0.55	0.123	2.43	0.841	1.30
6	-0.326	-2.09	-0.196	-0.73	-0.033	0.59	0.718	0.85
5	-0.019	0.07	0.130	-0.29	-0.026	0.06	0.751	0.77
4	-0.193	-1.16	0.148	-0.31	0.435	-0.31	0.777	0.78
3	0.094	0.37	0.342	-0.07	0.121	1.41	0.342	0.92
2	0.048	-0.28	0.248	-0.13	0.160	0.50	0.221	0.54
1	-0.009	-0.85	0.199	-0.07	0.226	0.27	0.061	0.45
0	0.207	1.17	0.208	0.21	-0.135	0.70	-0.165	0.41
-1	0.289	1.20	0.002	-0.14	0.458	-0.26	-0.030	0.16
-2	-0.247	-2.06	-0.288	-0.61	0.185	2.19	-0.487	0.28
-3	0.288	2.51**	-0.041	-0.04	0.282	0.92	-0.672	-0.53
-4	-0.117	-0.81	-0.329	-0.80	-0.414	0.97	-0.954	-0.97
-5	-0.064	-0.43	-0.212	-0.48	-0.221	-2.17**	-0.540	-1.24
-6	-0.237	-0.92	-0.148	-0.34	-0.054	-0.59	-0.318	-0.69
-7	-0.036	-0.37	0.090	0.24	-0.150	-0.30	-0.265	-0.58
-8	-0.199	-1.04	0.125	0.58	0.286	-1.19	-0.115	-0.57
-9	0.249	1.52	0.324	1.38	-0.237	1.02	-0.401	0.14
-10	0.075	0.49	0.075	0.49	-0.164	-0.78	-0.164	-0.78

df = 40 for upgrades df = 31 for downgrades * denotes signifance at %10 ** denotes significance at %5

Table 10. Non- Investable Emerging Markets' Reaction to Credit Rating Changes

Non - Invest	Upgrade				Downgrade			
Day	SAAR	t-stat	CAAR	t-stat	SAAR	t-stat	CAAR	t-stat
10	-0.266	-1.63	-2.412	-2.23	0.208	1.35	0.284	0.32
9	-0.208	-0.93	-2.146	-1.99	0.156	0.92	0.076	0.08
8	-0.221	-1.13	-1.938	-1.98	-0.209	-1.15	-0.080	-0.11
7	-0.378	-2.04	-1.717	-1.86	-0.056	-0.31	0.129	0.16
6	-0.016	-0.11	-1.339	-1.48	-0.085	-0.47	0.185	0.22
5	-0.193	-1.28	-1.323	-1.43	0.662	3.84	0.270	0.34
4	-0.040	-0.20	-1.130	-1.23	0.175	0.93	-0.392	-0.54
3	-0.018	-0.08	-1.090	-1.33	-0.198	-1.16	-0.567	-0.83
2	-0.193	-0.93	-1.072	-1.37	-0.352	-2.04**	-0.369	-0.56
1	-0.140	-0.73	-0.879	-1.26	-0.048	-0.22	-0.017	-0.04
0	0.091	0.42	-0.739	-1.12	-0.446	-1.22	0.031	0.03
-1	-0.144	-0.58	-0.830	-1.42	-0.327	-1.76*	0.477	1.03
-2	-0.112	-0.50	-0.686	-1.27	-0.257	-1.37	0.804	1.89
-3	-0.092	-0.36	-0.574	-1.13	0.169	1.04	1.061	2.43
-4	0.297	1.55	-0.482	-0.93	0.212	0.96	0.891	1.98
-5	-0.112	-0.51	-0.779	-1.76	0.239	1.26	0.679	1.79
-6	-0.273	-1.74	-0.667	-1.73	0.071	0.45	0.440	1.26
-7	-0.167	-1.30	-0.394	-1.15	-0.245	-1.55	0.369	1.06
-8	0.216	1.25	-0.228	-0.72	0.270	1.43	0.614	1.89
-9	-0.196	-1.04	-0.444	-1.48	0.099	0.53	0.344	1.33
-10	-0.247	-1.35	-0.247	-1.35	0.245	1.43	0.245	1.43

df = 37 for upgrades df = 47 for downgrades * denotes significance at %10 ** denotes significance at %5

In order to answer the first part of third research question, differences between investable level and non-investable level emerging markets have been investigated. The results showed non-investable level emerging markets have lower level of significant reaction compared to investment level emerging markets. The result can be interpreted as non-investable level emerging markets are used to credit rating changes due to economic volatility. Market reaction of the group is limited

compared to investable level emerging markets. Another difference between two groups is the timing of significant abnormal returns. While non-investable grade emerging markets have significant abnormal returns before and after event date, investable-grade emerging markets only have significant abnormal returns before the event date. The finding can also be interpreted as the non-investable markets are more unpredictable and markets have significant SAARs after the events.

Table 11. EU Member Countries' Market Reaction to Credit Rating Changes

EU - EM	Upgrade				Downgrade			
Day	SAAR	t-stat	CAAR	t-stat	SAAR	t-stat	CAAR	t-stat
10	-0.324	-2.28	-1.458	-1.41	0.087	0.54	-0.877	-0.95
9	-0.165	-0.88	-1.134	-1.14	-0.191	-0.84	-0.964	-1.07
8	0.004	0.02	-0.969	-1.08	-0.437	-2.14*	-0.773	-0.88
7	0.024	0.12	-0.973	-1.13	0.254	1.31	-0.335	-0.40
6	-0.094	-0.44	-0.996	-1.16	-0.036	-0.26	-0.590	-0.74
5	-0.253	-1.39	-0.903	-1.07	0.371	2.05	-0.553	-0.67
4	-0.246	-1.60	-0.650	-0.78	0.192	0.93	-0.924	-1.14
3	-0.082	-0.57	-0.404	-0.52	0.111	0.45	-1.116	-1.42
2	0.176	0.85	-0.322	-0.42	-0.371	-1.93*	-1.227	-1.59
1	0.019	0.11	-0.498	-0.73	-0.095	-0.38	-0.856	-1.18
0	0.113	0.62	-0.517	-0.79	-0.518	-1.08	-0.762	-1.20
-1	-0.108	-0.46	-0.630	-1.03	-0.189	-0.97	-0.244	-0.54
-2	-0.061	-0.32	-0.522	-0.94	0.100	0.57	-0.055	-0.13
-3	0.078	0.34	-0.461	-0.85	-0.009	-0.04	-0.154	-0.35
-4	-0.340	-1.88	-0.539	-0.96	-0.104	-0.48	-0.145	-0.38
-5	0.130	0.77	-0.198	-0.41	0.165	0.90	-0.041	-0.10
-6	-0.419	-2.11	-0.328	-0.89	0.085	0.41	-0.206	-0.48
-7	0.059	0.47	0.091	0.28	-0.321	-1.71*	-0.290	-0.75
-8	0.137	0.92	0.031	0.09	-0.159	-0.75	0.031	0.09
-9	-0.105	-0.62	-0.106	-0.37	0.005	0.03	0.190	0.83
-10	-0.001	0.00	-0.001	0.00	0.185	1.02	0.185	1.02

df = 34 for upgrades df = 34 for downgrades * denotes signifance at %10 ** denotes significance at %5

Table 12. Non EU Member Countries' Market Reaction to Credit Rating Changes

Non EU – EM	Upgrade				Downgrade			
Day	SAAR	t-stat	CAR	t-stat	SAAR	t-stat	CAR	t-stat
10	-0.255	-1.29	-1.835	-1.45	0.339	1.96	1.195	1.03
9	-0.318	-1.32	-1.580	-1.27	0.341	1.62	0.856	0.73
8	-0.113	-0.51	-1.262	-1.12	-0.103	-0.48	0.514	0.45
7	-0.268	-1.19	-1.149	-1.08	-0.051	-0.23	0.618	0.56
6	-0.175	-1.21	-0.882	-0.85	0.069	0.28	0.668	0.59
5	-0.021	-0.14	-0.706	-0.67	0.534	2.43	0.599	0.57
4	0.032	0.13	-0.686	-0.66	0.013	0.05	0.065	0.03
3	0.132	0.63	-0.718	-0.76	-0.249	-1.52	0.052	0.02
2	-0.303	-1.35	-0.850	-0.95	-0.238	-1.12	0.301	0.31
1	-0.250	-1.06	-0.547	-0.67	-0.019	-0.07	0.539	0.62
0	0.082	0.35	-0.297	-0.38	-0.003	-0.01	0.558	0.74
-1	0.206	0.79	-0.378	-0.55	-0.386	-1.54	0.561	0.76
-2	-0.302	-1.40	-0.585	-0.97	-0.163	-0.64	0.947	1.48
-3	0.145	0.63	-0.283	-0.50	0.192	1.17	1.110	1.67
-4	0.537	2.50**	-0.428	-0.89	0.248	0.89	0.918	1.33
-5	-0.294	-1.21	-0.965	-2.14	-0.031	-0.13	0.670	1.17
-6	-0.096	-0.43	-0.671	-1.42	0.153	0.77	0.701	1.45
-7	-0.267	-1.22	-0.575	-1.48	-0.112	-0.63	0.548	1.22
-8	-0.032	-0.16	-0.308	-1.09	0.327	1.37	0.660	1.50
-9	-0.067	-0.39	-0.276	-0.98	0.322	1.24	0.332	0.86
-10	-0.209	-1.07	-0.209	-1.07	0.011	0.05	0.011	0.05

df = 32 for upgrades df = 33 for downgrades * denotes signifance at %10 ** denotes significance at %5

The results are in contrast with the initial assumption of the thesis. Main assumption of the second part of the research question 3 claimed that effects of credit rating changes is softer for EU member countries. However, the findings showed that EU member emerging markets had worse market reactions at downgrade events. No significant abnormal returns were recorded for the non-EU member emerging markets at the same period. Also there was only one day with a more than 0.3

negative abnormal return during event window of non-EU member emerging markets. Number of the days with more than 0.3 negative abnormal returns is three for EU member emerging markets. The results can be read as the effect of financial crisis of small EU countries between 2008 and 2011.

CHAPTER 5

CONCLUSION

This thesis aimed to investigate stock market reactions of different groups to sovereign credit rating changes. Duration of the investigation period was 10 years starting from 01.01.2009. Credit rating changes were investigated by using Moody's, Standard and Poor's and Fitch credit rating announcements. The results showed that each sample has different response to credit rating announcements. BRICS countries –sample of emerging markets in this thesis- had a symmetric response. Abnormal return on event date is significant at %95 level at upgrade events. Abnormal return is significant on the 5th day before the event at downgrade events. Previous studies stated that significant abnormal returns were seen only at downgrade events. However, significant abnormal return was also seen at upgrade events. Findings can be read as that BRICS countries "expect" the downgrade but these markets react to the upgrades quickly after the announcement. When we compare developed countries and BRICS countries, both groups had significant abnormal returns before and after the downgrade events. The main difference between two groups is the volume of abnormal returns. Even tough both groups had significant abnormal returns before rating downgrades, standardized average abnormal return (SAAR) was ~0.20 for developed countries and ~0.35 for BRICS countries. This finding shows that even tough they both have significant abnormal returns during rating downgrades, BRICS countries have a much higher decrease. There were no significant abnormal returns for non-investable level emerging markets during rating upgrades. Only significant return was on the downgrade events and after the event date. However, investable

grade emerging markets had abnormal returns at both downgrades and upgrades. The results show that due to high frequency of rating changes in non-investable grade countries, markets do not react to the rating changes as much as investable grade countries. Another difference between these groups is the timing of abnormal returns. Non-investable markets had significant abnormal return only after the event date. On the other hand, investable grade markets had abnormal returns before the event. This finding states that investable markets value the expectation instead of the reality. The results of comparison of non-EU member and EU member emerging country indexes did not support the initial hypothesis. In the end, no significant abnormal returns were recorded for the non-EU member emerging markets at downgrade events. EU member countries had several days with negative abnormal returns in event window. Also EU member countries had more days with higher negative abnormal returns. The findings can be accepted as the effects of 2008 crisis for EU member countries.

Studies in the literature focused on either corporate bond ratings or sovereign credit ratings of the world as a whole. Number of the studies that focuses on emerging market sovereign ratings is very limited. This thesis focused not only to a broad country group but selected niche groups that will define effects of credit rating agencies on each of them. This thesis can also help researchers for further studies by showing them that findings of world level studies can be misleading. Significance distribution is totally different when countries are broken down to smaller sub-groups.

In terms of limitations, this thesis has time constraint that is last 10 years. Also all of the samples can be expanded by the countries that fits to the definition. The time period of the thesis was a downgrade dominant era since it is a post-crisis

period. Due to high dominance of the rating downgrades, country selection was an issue to form statistically valid samples in terms of rating upgrades.

. Further studies can focus on developing a model that projects possible outcomes of credit rating changes in the selected countries. Another possible study that can develop over this study can be the comparison of the effects of different event types (e.g: elections / news) and credit rating changes. Another aspect that can be investigated is the effect of credit rating changes from investable grade to non investable grade. An hypothesis that states rating downgrades and upgrades between two groups cause more significant abnormal returns, can be tested with the same methodology.

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